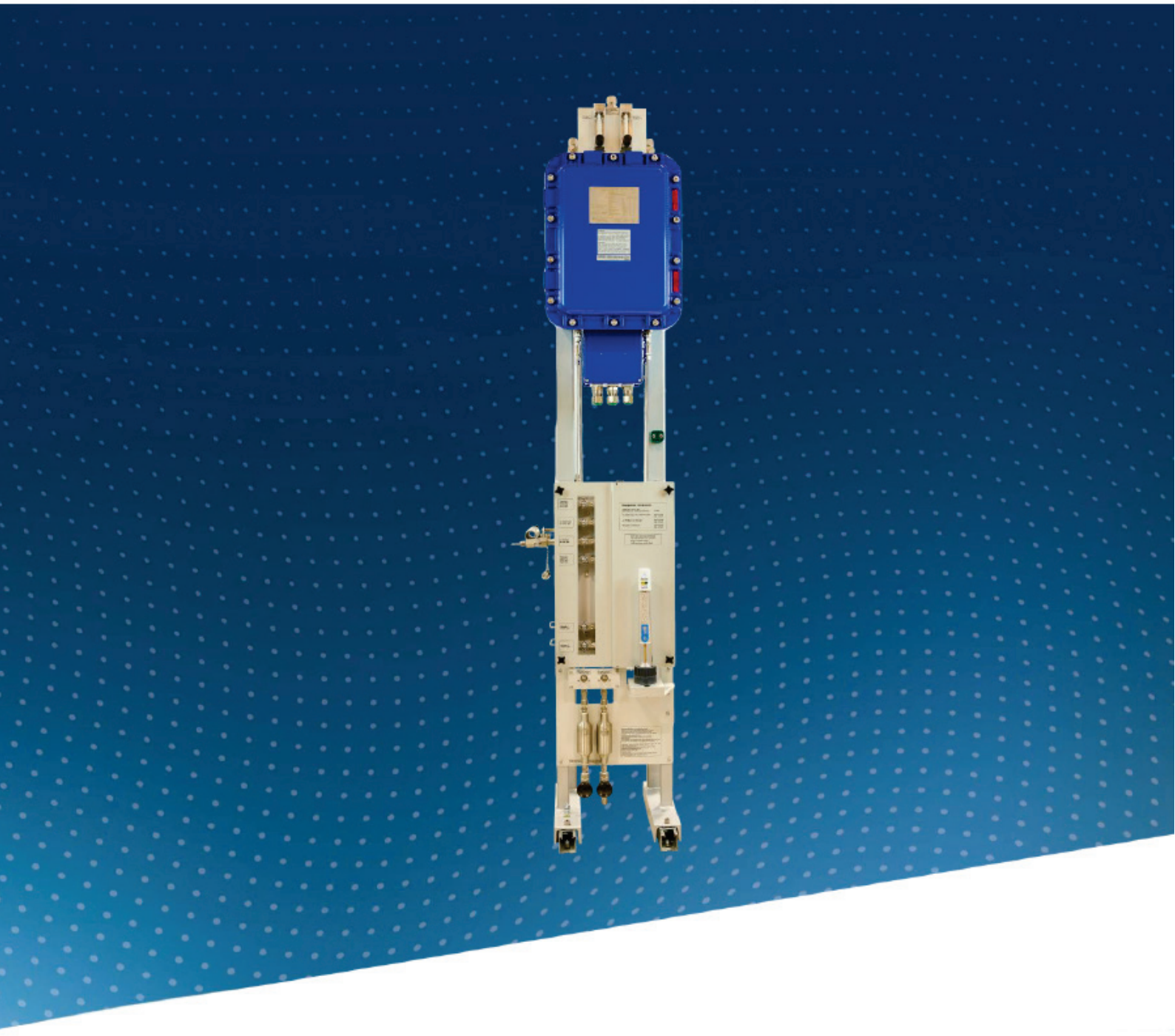

Maintenance manual

Process Gas Chromatograph RGC 7

Issued: 06.03.2024
Version: 02.1

Manufacturer

Contact our customer service department for technical information.

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Translation of the original document

The manual **RGC7_maintenance_manual_DE_V02.1** of 06.03.2024 is the original document for the gas chromatograph RGC7. This document is a template for translations in other languages.

Note

The latest version of this manual (and manuals other devices) can be downloaded at your convenience from our Internet page:

www.rmg.com

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Language	EN

Maintenance book RGC 7 ☐☐ No. ☐

Manufacturer no. RGC 7-M	
Year of manufacturing of RGC7-M	
Serial number basic modules (host) measuring unit no.	
Serial number columns cartridge	

Manufacturer no. RGC 7-C	
Year of manufacturing of RGC 7-C	
Software version controller	

Approved for	Calorific value ☐ Gas composition ☐

User	
Station	
Initial commissioning	

	Type / Carrier gas	**Column temperature [°C]**	**Column pressure [bar]**
Column module 1			
Column module 2			
Column module 3			

Date	
Signature	

Maintenance book RGC 7 ☐☐ No. ☐

Manufacturer no. RGC 7-M	
Year of manufacturing of RGC7-M	
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Approved for	Calorific value ☐ Gas composition ☐

User	
Station	
Initial commissioning	

	Type / Carrier gas	**Column temperature [°C]**	**Column pressure [bar]**
Column module 1			
Column module 2			
Column module 3			

Date	
Signature	

Table of contents

1. Instructions for the maintenance book

The maintenance book is part of the type examination certificate and serves to track the operating history of the unit. The keeping of the maintenance book is therefore obligatory. In the event of servicing, a copy of the maintenance book or the original must be sent to the manufacturer on request.

The data on the first inside page and the correspondingly marked data in the table section are entered when the unit is commissioned. They document the delivery status of the unit.

It is recommended that the unit is checked by the operator **every 8 weeks until the first annual routine maintenance / calibration** (control visits). **After the first routine maintenance / calibration**, a quarterly inspection visit by the operator is recommended. The values listed in table part 1 of this maintenance book must be documented at each inspection visit. This applies in particular to the visual inspection of the condition of all filter indicators in RGCs with molecular sieve column. Routine maintenance must be carried out once a year by qualified personnel in accordance with the manufacturer's instructions and documented in table part 3 of the maintenance book. All RGCs with molecular sieve columns have to be maintained once per year within the routine maintenance schedule. The routine maintenance work is not a prerequisite for calibrations. Calibration can be carried out at any time. The results of the calibration are to be documented in the table part 4 provided for this purpose.

1.1. RMG – Recommendation for RGC‘s

Note
RMG recommends the following measures and waiting times for maintenance work on the RGC 7 series gas chromatograph measures and waiting times given in the following table.

	Carrier gas filter		
	Inspection	***Replacement***	***Baking out***
RGC 704 Natural gas transmission pipeline / compressor stations, underground storage facilities	monthly	according to the need[1)]	annually[2)]

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n.a. – not available (There is no recommendation for this from RMG.)
[1)] If a coloration of the indicator is visible
[2)] the following must be made

1.2. Inspection

1.2.1. Operating parameters at the analysis computer RGC 7-C

The set values for the operating parameters are entered on the first inside page of this book by the commissioning engineer during commissioning and remain unchanged during the operating period unless they are changed by an RMG service engineer.

The actual values of the operating parameters can be checked at any time on the RGC 7-C analytical computer under the Status->Measuring unit tab or via RMGViewGC. Since constant monitoring of these values is carried out by the controller and since deviations "errors" are stored by the calibration office, these parameters do not have to be documented in the maintenance book. Each time the station is visited, it must therefore be checked whether active or inactive errors or warnings are displayed on the RGC 7-C.

1.2.2. Cylinder pressures

The cylinder pressures are read off regularly, i.e. at every maintenance procedure, directly from the high-pressure manometers of the respective pressure reducing unit of the corresponding gas cylinders and documented in the corresponding table in table part 1 of this book. If a bottle has been changed or switched, this must also be documented in the corresponding column. A marking shall also be made if the RGC is currently in fault.

The pressure values for the following must be read:

- Carrier gas 1 (helium)
- Carrier gas 2 (argon if available)
- Internal calibration gas

1.2.3. Carrier gas filter

All RGCs with a molecular sieve column contain carrier gas filters that are equipped with indicators. The conditions of the indicators are to be checked and documented during each control visit. If the indicator is partially or completely discolored, check the carrier gas supply for leaks. If there is no leakage, change the carrier gas cylinder immediately and replace the affected filter. If additional filters are installed, these must also be replaced if necessary. Furthermore, it is recommended to have the affected PGC analysed by the service promptly in order to exclude possible damage. It is further recommended to have the causative carrier gas cylinder checked for moisture.

1.3. Maintenance by the service technician

In this section, all changes and measures made by service technicians are entered. This concerns routine maintenance work, software updates as well as service work in the event of a malfunction. In the event of a malfunction, a brief description of the problem must be entered by the operator or by the service technician in the space provided.

It should be noted that this maintenance book is assigned to a measuring unit. In the event of a serious malfunction that requires replacement of the measuring unit, a new maintenance book must be created. If only the column cartridge or individual analysis modules are replaced, documentation must also be ensured and, if necessary, a new maintenance log must be created. **We recommend to give the old maintenance book or a copy of it to the manufacturer for analysis.**

2. Instruction of the manufacturer

2.1. Annual maintenance of the process gas chromatograph

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The annual inspection of the RGC 7 is to be carried out using the checklist (table part 4) by persons qualified for this maintenance by RMG.

2.2. Metrological verification / calibration

After completion of the maintenance described in section 2, routine calibration of the unit will follow, if necessary. For this purpose, a representative of the competent calibration authority must be on site. The type examination certificate and the relevant directives and standards listed therein are decisive for the verification of the system.

The calibration includes among others:

- Performing the service function "Commissioning by the calibration office" (checking the checksums)
- Checking the range of the existing current outputs for use authorized by the calibration office
- **Normal** calibration for all unit types **RGC 7** with internal calibration gas
- Checking with external calibration gases with chromatogram
- Checking the current transmission and/or the bus transmission of the values which must be calibrated
- Logging of all work carried out, entries in the maintenance book

After checking the parameters to be set according to calibration regulations in the RGC 7-C (tab: detail), the metrological test begins with opening the calibration switch and performing a calibration (tab: *Detail->01-RGC 7-C->Operating mode->Select standard calibration*). After calibration, the new **response factores** (tab: *Detail->09-Calibration results->**RF***) und **retention times** (tab: *Detail->09-Calibration results-->**RT***) noted in the maintenance book table part 4. In addition, the chromatograms of the calibration gas are compared with the sample chromatograms shown in the type examination certificate. The analysis of the chromatograms is possible with the help of the software RMGViewGC or by means of the display of the chromatograms in RGC 7-C (tab: *Graphic->Chrome*).

The metrological check of the unit is then carried out. For this purpose, the test gases specified in the type examination certificate are analysed one after the other, whereby at least six analyses per gas must be carried out. Ensure sufficient flushing. The result of the last or before last analysis in each case shall be used for the examination. The measurement results of these analyses are shown in the RGC 7-C (tab: Archive) and must be documented in the corresponding table. The relevant parameters for the verification (according to the type examination certificate) are listed in the table. The nominal values are to be taken from the certificates of the test gases used and also noted. A check of the chromatograms of the test gases is recommended.

Table part 1

Cylinder pressures

Carrier gas filter

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To be performed by:

- each inspection visit
- each maintenance

Entries in the book by:

- User
- RMG service

↪: The bottle has been changed	⚠: Device faulty

Carrier gas I/II		**Int. calibration gas**		**Carrier gas filter**			**Date**	**Abbre-viation**
Pressure / bar	↪	Pressure / bar	↪	Quantity TG	↪	⚠		

7

↳: The bottle has been changed	⚠: Device faulty

Carrier gas I/II		Int. calibration gas		Carrier gas filter			Date	Abbre-viation
Pressure / bar	↳	Pressure / bar	↳	Quantity TG	↳	⚠		

↪: The bottle has been changed	⚠: Device faulty

Carrier gas I/II		Int. calibration gas		Carrier gas filter			Date	Abbre-viation
Pressure / bar	↪	Pressure / bar	↪	Quantity TG	↪	⚠		

Filter: U: uncolored **T: partially colored** VU: from below/ VO: from above **V: fully colored** **↪: replaced**	⚠ : Device faulty

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Carrier gas filter at RGC				**Pre-filter flushing unit Wall mounted**						**Date**	**Abbre-viation**
U	**T**	**V**	**↪**	**U**	**T**	**V**	**↪**	**↪**	⚠		

Filter: U: uncolored	T: partially colored VU: from below/ VO: from above	⚠ : Device faulty
V: fully colored	↪: replaced	

Carrier gas filter at RGC				Pre-filter flushing unit Wall mounted						Date	Abbre-viation
U	T	V	↪	U	T	V	↪	↪	⚠		

Table part 2

General maintenance actions

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To be performed by:

- Annual routine maintenance
- Software update
- Metrological testing
- Calibration
- Repairs

Entries in the book by:

- Qualified personnel
- RMG service

Maintenance action

Accomplished actions		
Routine maintenance		Table 3
Software update		
Metrological testing		Table 4
Calibration		Table 4
Defect		see below

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Description of the problem	Action

Performed **by**	
Performed **on**	

Signature	

Maintenance action

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Accomplished actions		
Routine maintenance		Table 3
Software update		
Metrological testing		Table 4
Calibration		Table 4
Defect		see below

Description of the problem	Action

Performed **by**	
Performed **on**	

Signature	

Maintenance action

Accomplished actions		
Routine maintenance		Table 3
Software update		
Metrological testing		Table 4
Calibration		Table 4
Defect		see below

15

Description of the problem	Action

Performed **by**	
Performed **on**	

Signature	

Maintenance action

16

Accomplished actions		
Routine maintenance		Table 3
Software update		
Metrological testing		Table 4
Calibration		Table 4
Defect		see below

Description of the problem	Action

Performed **by**	
Performed **on**	

Signature	

Maintenance action

Accomplished actions		
Routine maintenance		Table 3
Software update		
Metrological testing		Table 4
Calibration		Table 4
Defect		see below

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Description of the problem	Action

Performed **by**	
Performed **on**	

Signature	

Maintenance action

18

Accomplished actions		
Routine maintenance		Table 3
Software update		
Metrological testing		Table 4
Calibration		Table 4
Defect		see below

Description of the problem	Action

Performed **by**	
Performed **on**	

Signature	

Maintenance action

Accomplished actions		
Routine maintenance		Table 3
Software update		
Metrological testing		Table 4
Calibration		Table 4
Defect		see below

Description of the problem	Action

Performed **by**	
Performed **on**	

Signature	

Maintenance action

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Accomplished actions		
Routine maintenance		Table 3
Software update		
Metrological testing		Table 4
Calibration		Table 4
Defect		see below

Description of the problem	Action

Performed **by**	
Performed **on**	

Signature	

Maintenance action

Accomplished actions		
Routine maintenance		Table 3
Software update		
Metrological testing		Table 4
Calibration		Table 4
Defect		see below

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Description of the problem	Action

Performed **by**	
Performed **on**	

Signature	

Maintenance action

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Accomplished actions		
Routine maintenance		Table 3
Software update		
Metrological testing		Table 4
Calibration		Table 4
Defect		see below

Description of the problem	Action

Performed **by**	
Performed **on**	

Signature	

Table part 3

Annual routine maintenance

Durchzuführen bei:

- Annual routine maintenance

Entries in the book by:

- Qualified personnel
- RMG service

Checked:	OK	n. OK	n. avail.
Check list HD reduction type DRS			
Functional check of the controller			
Leakage check			
Functional check heater of the HD reduction (if included)			
Functional check SBV			
Check list bottle cage			
Control and documentation of all bottle pressures			
Functional check of the bottle heater			
Functional check of the HD controller			
Checking the contact manometers			
Funct. check 2. Pressure reg. step (porter regulator if included)			
Leakage check			
Check list meas. unit RGC 7-M and controller RGC 7-C			
Check pre-filter gas switching unit (change the filter if necessary)			
Leakage check (also of the analysis module)			
Checking of inflow pressure support-, measurement-, int. and ext. calibration gas			
Functional check of the housing heating in the measuring unit			
Checking of all the relev. operation parameters (see chapter 1 operating param.)			
Evaluation of the documented automatic calibrations			
Control of the "method" by means of special service software			
Control of the retention times			
Evaluation of the chromatogrammes			
Actions for RGC's with a molecular sieve column			
Baking out overnight (600-700 min)			
Replacement of the dry agent cartridge			
Replacement of the carrier gas filter before the measuring unit (if included) (Note: up to 3 filters can be mounted)			
Date			
Signature			

Checked:	OK	n. OK	n. avail.
Check list HD reduction type DRS			
Functional check of the controller			
Leakage check			
Functional check heater of the HD reduction (if included)			
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Table part 4

Test gas analyses

To be performed by:

- Metrological testing
- Calibration

Entries in the book by:

- Qualified personnel
- RMG service

Note:

The handwritten entry is not required if a clearly labelled printout of the values is filed in the maintenance book or if the metrological protocol is available in printed form and reference is made to it.

Sequence of a metrological test / calibration

- Checking of software CRC
- Carry out a calibration for all RGC 7 with logging of the
  - retention times (RTZ, or RT) factors (check percentage deviations) RT drift for N2)
  - Response factors (RFZ or RF)
- Analysis of the test gases
- Checking the chromatograms / data transmission
  The current outputs are only to be checked if they are used for transferring to the calibration office.
- If necessary include remarks.

	Basic calibration		**Normal calibration**	
	RTZ / s	RFZ	RT / s	RF
Nitrogen				
Methane				
Carbon dioxide				
Ethane				
Propane				
Iso-butane				
n-butane				
neo-pentane				
iso-pentane				
n-pentane				
Hexane (C6+)				
Heptane				
Octane				
Nonane				
Helium				
Hydrogen				
Oxygen				

Should it be calibrated?	↓	Test gas 1			Test gas 2		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 3			Test gas 4		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 5			Test gas 6		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

	OK?
Checking the chromatogram of the internal calibration gas	
Checking the chromatogram of test gas 1	
Checking the chromatogram of test gas 2	
Checking the chromatogram of test gas 3	
Checking the chromatogram of test gas 4	
Checking the chromatogram of test gas 5	
Checking the chromatogram of test gas 6	
Checking the current outputs range	
Checking the values transmitted by the calibration office at the outputs	
Checking the software and the kernel CRC's	
Are all the results properly recorded?	

Comments

Signatures	
Service	
Calibration	

The signatures refer to the entire metrological inspection / calibration, i. e.
including the entries on pages 35 to 39.

Sequence of a metrological test / calibration

1. Checking of software CRC
2. Carry out a calibration for all RGC 7 with logging of the
   - retention times (RTZ, or RT) factors (check percentage deviations) RT drift for N2)
   - Response factors (RFZ or RF)
3. Analysis of the test gases
4. Checking the chromatograms / data transmission
   The current outputs are only to be checked if they are used for transferring to the calibration office.
5. If necessary include remarks.

	Basic calibration		Normal calibration	
	RTZ / s	RFZ	RT / s	RF
Nitrogen				
Methane				
Carbon dioxide				
Ethane				
Propane				
Iso-butane				
n-butane				
neo-pentane				
iso-pentane				
n-pentane				
Hexane (C6+)				
Heptane				
Octane				
Nonane				
Helium				
Hydrogen				
Oxygen				

Should it be calibrated?	↓	Test gas 1			Test gas 2		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 3			Test gas 4		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 5			Test gas 6		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

	OK?
Checking the chromatogram of the internal calibration gas	
Checking the chromatogram of test gas 1	
Checking the chromatogram of test gas 2	
Checking the chromatogram of test gas 3	
Checking the chromatogram of test gas 4	
Checking the chromatogram of test gas 5	
Checking the chromatogram of test gas 6	
Checking the current outputs range	
Checking the values transmitted by the calibration office at the outputs	
Checking the software and the kernel CRC's	
Are all the results properly recorded?	

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Comments

Signatures	
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Calibration	

The signatures refer to the entire metrological inspection / calibration, i. e.
including the entries on pages 35 to 39.

Sequence of a metrological test / calibration

1. Checking of software CRC
2. Carry out a calibration for all RGC 7 with logging of the
   - retention times (RTZ, or RT) factors (check percentage deviations) RT drift for N2)
   - Response factors (RFZ or RF)
3. Analysis of the test gases
4. Checking the chromatograms / data transmission
   The current outputs are only to be checked if they are used for transferring to the calibration office.
5. If necessary include remarks.

	Basic calibration		Normal calibration	
	RTZ / s	RFZ	RT / s	RF
Nitrogen				
Methane				
Carbon dioxide				
Ethane				
Propane				
Iso-butane				
n-butane				
neo-pentane				
iso-pentane				
n-pentane				
Hexane (C6+)				
Heptane				
Octane				
Nonane				
Helium				
Hydrogen				
Oxygen				

Should it be calibrated?	↓	Test gas 1			Test gas 2		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 3			Test gas 4		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 5			Test gas 6		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

	OK?
Checking the chromatogram of the internal calibration gas	
Checking the chromatogram of test gas 1	
Checking the chromatogram of test gas 2	
Checking the chromatogram of test gas 3	
Checking the chromatogram of test gas 4	
Checking the chromatogram of test gas 5	
Checking the chromatogram of test gas 6	
Checking the current outputs range	
Checking the values transmitted by the calibration office at the outputs	
Checking the software and the kernel CRC's	
Are all the results properly recorded?	

Comments

Signatures	
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Calibration	

The signatures refer to the entire metrological inspection / calibration, i. e.
including the entries on pages 35 to 39.

Sequence of a metrological test / calibration

1. Checking of software CRC
2. Carry out a calibration for all RGC 7 with logging of the
   - retention times (RTZ, or RT) factors (check percentage deviations) RT drift for N2)
   - Response factors (RFZ or RF)
3. Analysis of the test gases
4. Checking the chromatograms / data transmission
   The current outputs are only to be checked if they are used for transferring to the calibration office.
5. If necessary include remarks.

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	Basic calibration		Normal calibration	
	RTZ / s	RFZ	RT / s	RF
Nitrogen				
Methane				
Carbon dioxide				
Ethane				
Propane				
Iso-butane				
n-butane				
neo-pentane				
iso-pentane				
n-pentane				
Hexane (C6+)				
Heptane				
Octane				
Nonane				
Helium				
Hydrogen				
Oxygen				

Should it be calibrated?	↓	Test gas 1			Test gas 2		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 3			Test gas 4		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 5			Test gas 6		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

	OK?
Checking the chromatogram of the internal calibration gas	
Checking the chromatogram of test gas 1	
Checking the chromatogram of test gas 2	
Checking the chromatogram of test gas 3	
Checking the chromatogram of test gas 4	
Checking the chromatogram of test gas 5	
Checking the chromatogram of test gas 6	
Checking the current outputs range	
Checking the values transmitted by the calibration office at the outputs	
Checking the software and the kernel CRC's	
Are all the results properly recorded?	

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Comments

Signatures	
Service	
Calibration	

The signatures refer to the entire metrological inspection / calibration, i. e.
including the entries on pages 35 to 39.

Sequence of a metrological test / calibration

1. Checking of software CRC
2. Carry out a calibration for all RGC 7 with logging of the
   - retention times (RTZ, or RT) factors (check percentage deviations) RT drift for N2)
   - Response factors (RFZ or RF)
3. Analysis of the test gases
4. Checking the chromatograms / data transmission
   The current outputs are only to be checked if they are used for transferring to the calibration office.
5. If necessary include remarks.

	Basic calibration		Normal calibration	
	RTZ / s	RFZ	RT / s	RF
Nitrogen				
Methane				
Carbon dioxide				
Ethane				
Propane				
Iso-butane				
n-butane				
neo-pentane				
iso-pentane				
n-pentane				
Hexane (C6+)				
Heptane				
Octane				
Nonane				
Helium				
Hydrogen				
Oxygen				

Should it be calibrated?	↓	Test gas 1			Test gas 2		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 3			Test gas 4		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 5			Test gas 6		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

	OK?
Checking the chromatogram of the internal calibration gas	
Checking the chromatogram of test gas 1	
Checking the chromatogram of test gas 2	
Checking the chromatogram of test gas 3	
Checking the chromatogram of test gas 4	
Checking the chromatogram of test gas 5	
Checking the chromatogram of test gas 6	
Checking the current outputs range	
Checking the values transmitted by the calibration office at the outputs	
Checking the software and the kernel CRC's	
Are all the results properly recorded?	

Comments

Signatures	
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Calibration	

The signatures refer to the entire metrological inspection / calibration, i. e.
including the entries on pages 35 to 39.

Sequence of a metrological test / calibration

1. Checking of software CRC
2. Carry out a calibration for all RGC 7 with logging of the
   - retention times (RTZ, or RT) factors (check percentage deviations) RT drift for N2)
   - Response factors (RFZ or RF)
3. Analysis of the test gases
4. Checking the chromatograms / data transmission
   The current outputs are only to be checked if they are used for transferring to the calibration office.
5. If necessary include remarks.

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	Basic calibration		Normal calibration	
	RTZ / s	RFZ	RT / s	RF
Nitrogen				
Methane				
Carbon dioxide				
Ethane				
Propane				
Iso-butane				
n-butane				
neo-pentane				
iso-pentane				
n-pentane				
Hexane (C6+)				
Heptane				
Octane				
Nonane				
Helium				
Hydrogen				
Oxygen				

Should it be calibrated?	↓	Test gas 1			Test gas 2		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 3			Test gas 4		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 5			Test gas 6		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

	OK?
Checking the chromatogram of the internal calibration gas	
Checking the chromatogram of test gas 1	
Checking the chromatogram of test gas 2	
Checking the chromatogram of test gas 3	
Checking the chromatogram of test gas 4	
Checking the chromatogram of test gas 5	
Checking the chromatogram of test gas 6	
Checking the current outputs range	
Checking the values transmitted by the calibration office at the outputs	
Checking the software and the kernel CRC's	
Are all the results properly recorded?	

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Signatures	
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The signatures refer to the entire metrological inspection / calibration, i. e.
including the entries on pages 35 to 39.

Sequence of a metrological test / calibration

1. Checking of software CRC
2. Carry out a calibration for all RGC 7 with logging of the
   - retention times (RTZ, or RT) factors (check percentage deviations) RT drift for N2)
   - Response factors (RFZ or RF)
3. Analysis of the test gases
4. Checking the chromatograms / data transmission
   The current outputs are only to be checked if they are used for transferring to the calibration office.
5. If necessary include remarks.

	Basic calibration		Normal calibration	
	RTZ / s	RFZ	RT / s	RF
Nitrogen				
Methane				
Carbon dioxide				
Ethane				
Propane				
Iso-butane				
n-butane				
neo-pentane				
iso-pentane				
n-pentane				
Hexane (C6+)				
Heptane				
Octane				
Nonane				
Helium				
Hydrogen				
Oxygen				

Should it be calibrated?	↓	Test gas 1			Test gas 2		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 3			Test gas 4		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 5			Test gas 6		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

	OK?
Checking the chromatogram of the internal calibration gas	
Checking the chromatogram of test gas 1	
Checking the chromatogram of test gas 2	
Checking the chromatogram of test gas 3	
Checking the chromatogram of test gas 4	
Checking the chromatogram of test gas 5	
Checking the chromatogram of test gas 6	
Checking the current outputs range	
Checking the values transmitted by the calibration office at the outputs	
Checking the software and the kernel CRC's	
Are all the results properly recorded?	

Comments

Signatures	
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Calibration	

The signatures refer to the entire metrological inspection / calibration, i. e.
including the entries on pages 35 to 39.

Sequence of a metrological test / calibration

1. Checking of software CRC
2. Carry out a calibration for all RGC 7 with logging of the
   - retention times (RTZ, or RT) factors (check percentage deviations) RT drift for N2)
   - Response factors (RFZ or RF)
3. Analysis of the test gases
4. Checking the chromatograms / data transmission
   The current outputs are only to be checked if they are used for transferring to the calibration office.
5. If necessary include remarks.

	Basic calibration		Normal calibration	
	RTZ / s	RFZ	RT / s	RF
Nitrogen				
Methane				
Carbon dioxide				
Ethane				
Propane				
Iso-butane				
n-butane				
neo-pentane				
iso-pentane				
n-pentane				
Hexane (C6+)				
Heptane				
Octane				
Nonane				
Helium				
Hydrogen				
Oxygen				

Should it be calibrated?	↓	Test gas 1			Test gas 2		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 3			Test gas 4		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 5			Test gas 6		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

	OK?
Checking the chromatogram of the internal calibration gas	
Checking the chromatogram of test gas 1	
Checking the chromatogram of test gas 2	
Checking the chromatogram of test gas 3	
Checking the chromatogram of test gas 4	
Checking the chromatogram of test gas 5	
Checking the chromatogram of test gas 6	
Checking the current outputs range	
Checking the values transmitted by the calibration office at the outputs	
Checking the software and the kernel CRC's	
Are all the results properly recorded?	

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Comments

Signatures	
Service	
Calibration	

The signatures refer to the entire metrological inspection / calibration, i. e.
including the entries on pages 35 to 39.

Sequence of a metrological test / calibration

1. Checking of software CRC
2. Carry out a calibration for all RGC 7 with logging of the
   - retention times (RTZ, or RT) factors (check percentage deviations) RT drift for N2)
   - Response factors (RFZ or RF)
3. Analysis of the test gases
4. Checking the chromatograms / data transmission
   The current outputs are only to be checked if they are used for transferring to the calibration office.
5. If necessary include remarks.

	Basic calibration		Normal calibration	
	RTZ / s	RFZ	RT / s	RF
Nitrogen				
Methane				
Carbon dioxide				
Ethane				
Propane				
Iso-butane				
n-butane				
neo-pentane				
iso-pentane				
n-pentane				
Hexane (C6+)				
Heptane				
Octane				
Nonane				
Helium				
Hydrogen				
Oxygen				

Should it be calibrated?	↓	Test gas 1			Test gas 2		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 3			Test gas 4		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

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Should it be calibrated?	↓	Test gas 5			Test gas 6		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

	OK?
Checking the chromatogram of the internal calibration gas	
Checking the chromatogram of test gas 1	
Checking the chromatogram of test gas 2	
Checking the chromatogram of test gas 3	
Checking the chromatogram of test gas 4	
Checking the chromatogram of test gas 5	
Checking the chromatogram of test gas 6	
Checking the current outputs range	
Checking the values transmitted by the calibration office at the outputs	
Checking the software and the kernel CRC's	
Are all the results properly recorded?	

Comments

Signatures	
Service	
Calibration	

The signatures refer to the entire metrological inspection / calibration, i. e.
including the entries on pages 35 to 39.

Sequence of a metrological test / calibration

1. Checking of software CRC
2. Carry out a calibration for all RGC 7 with logging of the
   - retention times (RTZ, or RT) factors (check percentage deviations) RT drift for N2)
   - Response factors (RFZ or RF)
3. Analysis of the test gases
4. Checking the chromatograms / data transmission
   The current outputs are only to be checked if they are used for transferring to the calibration office.
5. If necessary include remarks.

	Basic calibration		Normal calibration	
	RTZ / s	RFZ	RT / s	RF
Nitrogen				
Methane				
Carbon dioxide				
Ethane				
Propane				
Iso-butane				
n-butane				
neo-pentane				
iso-pentane				
n-pentane				
Hexane (C6+)				
Heptane				
Octane				
Nonane				
Helium				
Hydrogen				
Oxygen				

Should it be calibrated?	↓	Test gas 1			Test gas 2		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 3			Test gas 4		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

Should it be calibrated?	↓	Test gas 5			Test gas 6		
		type		errors	type		errors
		nominal	actual	absolute	nominal	actual	absolute
Calorific value							
Standard density							
Nitrogen							
Methane							
Carbon dioxide							
Ethane							
Propane							
Iso-butane							
n-butane							
neo-pentane							
iso-pentane							
n-pentane							
Hexane (C6+)							
Heptane							
Octane							
Nonane							
Helium							
Hydrogen							
Oxygen							

	OK?
Checking the chromatogram of the internal calibration gas	
Checking the chromatogram of test gas 1	
Checking the chromatogram of test gas 2	
Checking the chromatogram of test gas 3	
Checking the chromatogram of test gas 4	
Checking the chromatogram of test gas 5	
Checking the chromatogram of test gas 6	
Checking the current outputs range	
Checking the values transmitted by the calibration office at the outputs	
Checking the software and the kernel CRC's	
Are all the results properly recorded?	

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Comments

Signatures	
Service	
Calibration	

The signatures refer to the entire metrological inspection / calibration, i. e.
including the entries on pages 35 to 39.

Subject to technical changes

More information
If you would like to receive more information about the products and solutions of RMG visit our website:

www.rmg.com

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