



Compliance & Transparency – Gas CTG 3.0

Supported Standards Manual

Lists the standards supported by CTG 3.0 for list printing, compliance analysis and documentation

Notes

The latest version of this documentation can be found in the QuantityWare [Knowledge Base](#). All documentation is kept current for the combinations of latest BCS release with the latest supported SAP Oil, Gas, & Energy release. For all currently supported combinations see [Note #000086 "Support and Release \(Lifecycle\) details"](#) page 2, "Release Lifecycle".

Your release level can be determined via:

`"/o/QTYW/COCKPIT" -> "Cockpit" -> "Support Package Level"`

Version History

Version	Date	Description
00	2017-03-17	Initial Version
01	2017-11-11	S/4HANA 1709 validity added, ISO 6578:2017 support added, AGA Report No. 8 2017 support added
02	2019-02-17	S/4HANA 1809 validity confirmed
03	2019-11-20	S/4HANA 1909 validity confirmed
04	2021-09-21	S/4HANA 2020 / 2020_EX validity confirmed - modern QW document style applied - 30A CSP02 / 30B CSP01 changes
05	2023-11-01	30A CSP03 / 30B CSP02 changes

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1. Compliance & Transparency – Gas: List of Supported Standards

Your natural gas bulk product quantity value calculations in your SAP Oil, Gas, & Energy system are defined by seven different types of standards that are all equally relevant and need to be considered for your quantity conversion configuration:

- standards defining the detailed calculation model - this calculation model is defined within the SAP QCI and may be enhanced or replaced by customer specific BAdI implementations in your systems
- standards defining correction factors due to pressure and temperature on product volumes and energies – a low pressure ideal or real gas implementation is defined within the SAP QCI and may be enhanced or replaced by customer specific BAdI implementations in your systems
- standards defining calculations of densities and heating values from composition including physical property data – the SAP QCI does not contain an implementation for this type of calculation, but may be enhanced by customer specific BAdI implementations in your systems
- standards defining the conversion factors between mass and weight (NGL/LPG)
- standards defining the conversion factors between UoM of one dimension
- standards defining metering technologies
- standards defining terminology

CTG 3.0 provides implementation procedures that are based on the standards listed in the following chapters. Using these implementations, you may:

- Print detailed lists via the Gas Measurement Cockpit (GMC) to analyze your existing SAP QCI configurations
- Perform sophisticated laboratory calculations to determine correct quantity conversion defaults for business transactions.

1.1. Standards - Calculation Model

1. SAP QCI standard model

This low-pressure model is typically in use in SAP QCI installed base systems. During CTG 3.0 implementation, a detailed analysis of your SAP QCI natural gas implementations should be performed.

1.2. Standards – Temperature and Pressure Corrections – CTPL - NGL/LPG

1. API MPMS Chapter 11.2.2(M)
2. API MPMS Chapter 11.2.4 – second edition - GPA 8217 - 2019
3. API MPMS Chapter 11.2.4 – first edition - GPA TP-27
4. API MPMS Chapter 11.2.5 – GPA 8117 – second edition
5. API MPMS Chapter 11.2.5 - GPA TP-15 – first edition
6. ISO 6578 Second edition 2017-10
7. ISO 6578 First edition 1991-12-01
8. QuantityWare extension of GPA TP-27 for 20 °C (and other base temperatures)
9. GPA TP-25
10. QuantityWare extension of GPA TP-25 for 15 °C and 60 °F

The Gas Measurement Cockpit enables list printing (Online and PDF documents) for all standards noted above.

1.3. Standards – Temperature and Pressure Corrections – Natural Gas

1. ISO 12213 (Part 1 to 3) Second edition 2006-11-15
2. AGA Report No. 8 Part 1: “Thermodynamic Properties of Natural Gas and Related Gases – DETAIL and GROSS Equations of State” third Edition April 2017
3. AGA Report No. 8 Part 2: “Thermodynamic Properties of Natural Gas and Related Gases – GERG-1008 Equation of State” First Edition April 2017
4. Compressibility Factors of Natural Gas and other related Hydrocarbon Gases” AGA Transmission Measurement Committee Report No. 8, Second Edition, November 1992, 2nd Printing July 1994, API MPMS Chapter 14.2, Second Edition, Revised August 1994, Reaffirmed, February 2006.
5. ISO 13443 First edition 1996-12-15 (reviewed and confirmed 2020)
6. GOST 30319.0/1/2/3 – 96: Natural Gas. Methods of Calculation of Physical Properties
7. J. Res. Natl. Inst. Stand. Technol. 113, 341-350 (2008) - Revised Standardized Equation for Hydrogen Gas Densities for Fuel Consumption Applications.
8. SGERG-mod-H2 equation for natural gas / hydrogen mixtures.



As stated in the research paper from the DVGW: “Calculation of Compression Factors and Gas Law Deviation Factors Using the Modified SGERG-Equation SGERG-mod-H2” ...“The AGA8 equation and the GERG-2008 equation generally agree better than $\pm 0.1\%$ for the measured values for all data sets in the entire pressure range. It can thus be expected that these equations of state can be used for any desired H₂ fractions without significantly affecting the underlying 0.1% uncertainty of the equations.”

The Gas Measurement Cockpit enables list printing (Online) for all standards noted above in client 045.

1.4. Standards - Calculation of Densities and Heating Values from Composition

1. ISO 6976 Third edition 2016¹
2. ISO 6976 Second edition 1995, including Corrigendum 1 to 3
3. ISO 6578 Second edition 2017
4. ISO 6578 First edition 1991
5. GOST 22667-82 (incl. revision 1,1993)
6. GPA 8173-94
7. ASTM D4784 – revised Klosek and McKinley Model
8. GPA 2172-96 / API MPMS Chapter 14.5 - dry natural gas
9. GPA 2172-09 / API MPMS Chapter 14.5 - dry natural gas
10. GPA 2172-14 / API MPMS Chapter 14.5 - dry natural gas
11. GPA 2172-19 / API MMS Chapter 14.5 – dry natural gas
12. GPA Standard 2145-03 Rev.2
13. GPA Standard 2145-09
14. GPA Standard 2145-16

The Gas Measurement Cockpit enables list printing (Online) for all standards noted above via the “Laboratory Calculations” tab strip in client 045.

1.5. Standards - Conversion Factors Between Mass and Weight – NGL/LPG

1. ASTM D1250-08 – API MPMS Chapter 11.5
2. ASTM D1250-80 - Tables 8, 26, 56
3. DIN 51757-94(11)

¹ New components not yet supported

The Petroleum Measurement Cockpit (which can be accessed for CTG 3.0 as well) enables list printing (Online and PDF documents) for all standards noted above.

1.6. Standards - UoM Conversion Factors

1. API MPMS Chapter 15 – Guidelines for the Use of the International System of Units (SI) in the Petroleum and Allied Industries
2. API MPMS Chapter 11.5 – Annex D - ASTM D1250-08(13)e1
3. Petroleum Measurement Tables Volume XI/XII - ASTM D1250-80: Table 1
4. IEEE/ASTM SI 10TM – American National Standard for the Use of the International System of Units (SI): The Modern Metric System (2002)
5. NIST – Guide for the Use of the International System of Units (SI) - Special Publication 811 – 2008
6. BIPM – Le Système international d’unités (SI) – 2006

1.7. Standards - Metering Technologies

Not supported by CTG 3.0.

1.8. Standards - Terminology

1. GPA 1167-83
2. ISO/DIS 14532
3. Terminology defined in standards listed above

For all standard implementations of all types defined above and the complete software integration layer, QuantityWare has defined automated test tools. These test programs are shipped within CTG to all customers. After CTG installation, you run the installation test within a four-week period (using a four-week test usage key).

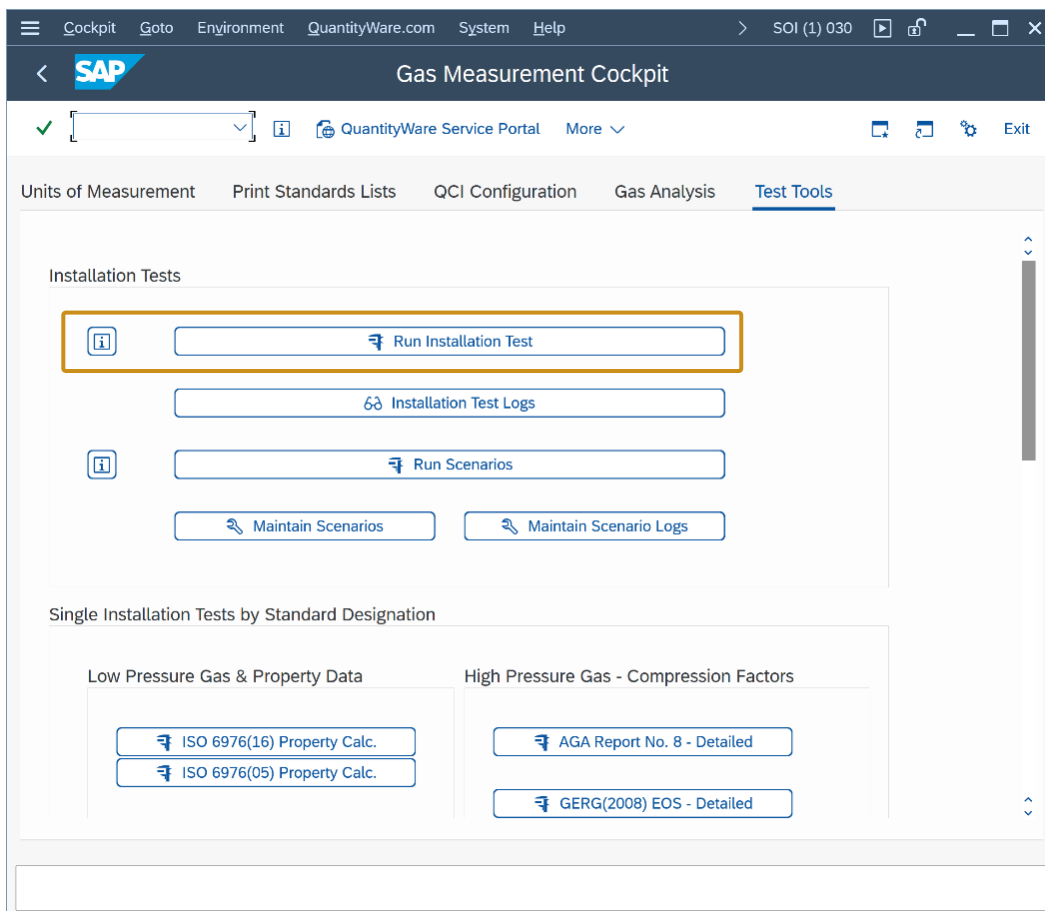
In the next chapter, we provide a detailed description as to how customers can execute the QuantityWare CTG installation test.

Appendix A. Supported Standards – Installation Test

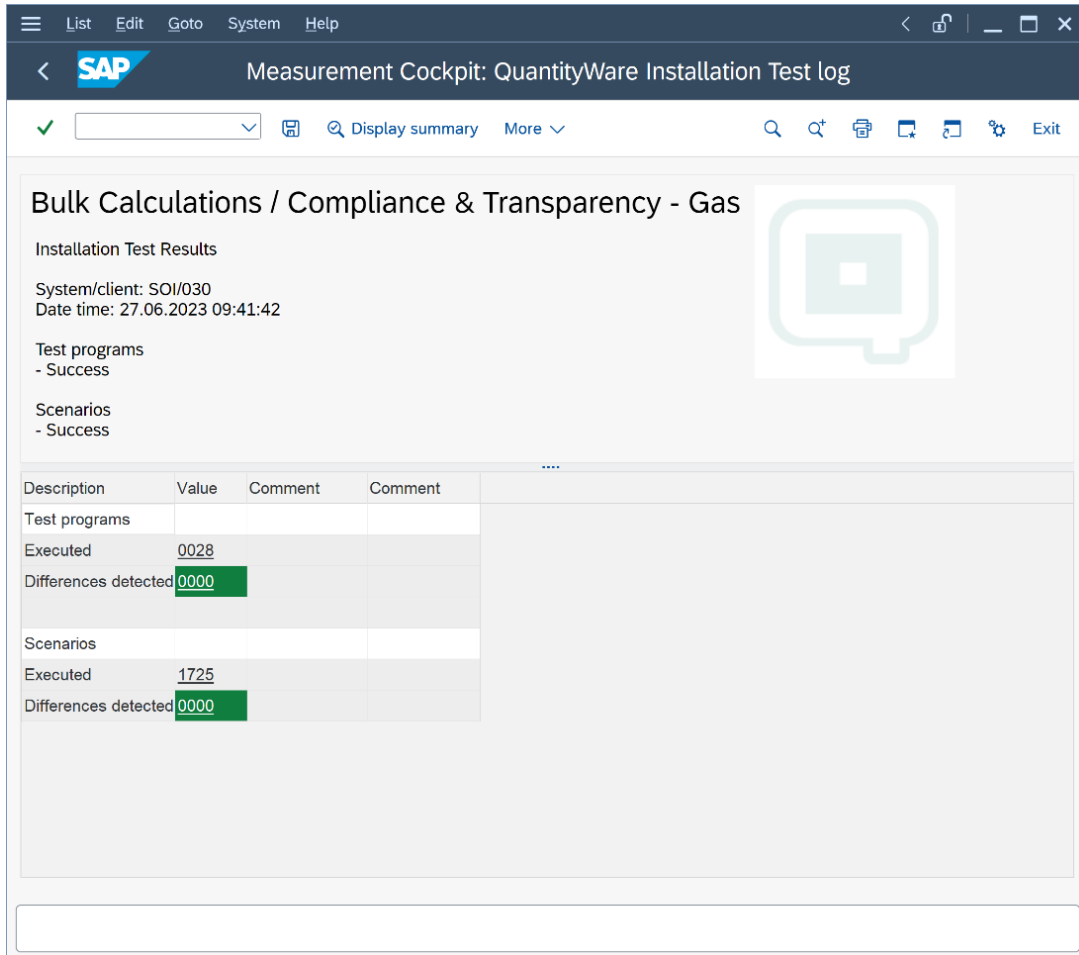
For all standard implementations, QuantityWare delivers an individual installation test. Each test is implemented as a SAP test report, which typically executes two test cases. The CTG installation test is identical with the BCG installation test and is the sum of:

1. All individual installation tests
2. Additional integration test reports
3. 1500 Test scenarios

The CTG installation test is executed with one click from the Gas Measurement Cockpit (GMC) and is to be performed only in the QuantityWare template client 045, in one dedicated system in your system landscape. Execution of the installation test is started while logged on to the CTG template client (045), where you simply click on “Run Installation Test” in tab strip “Test Tools” of the GMC:



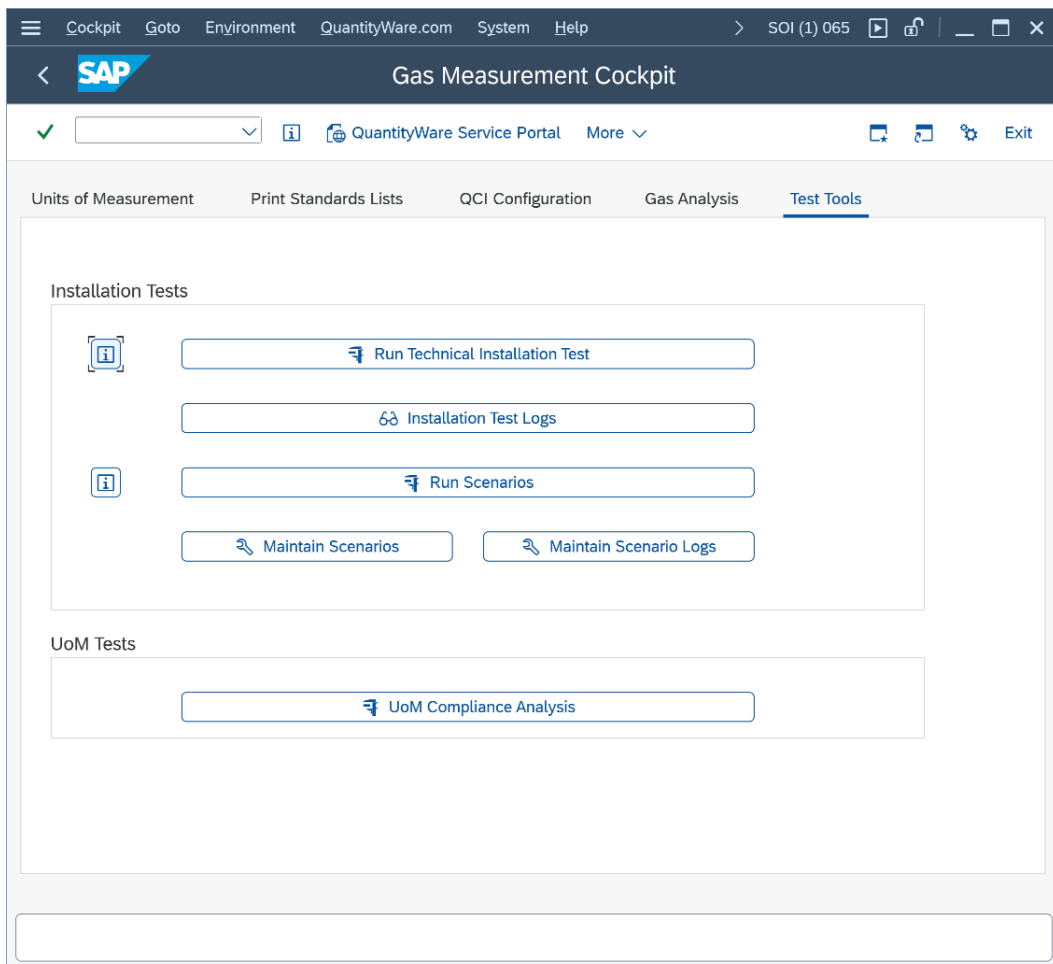
If the test is executed successfully, you see the following list:



If you want to execute a single test for a specific standard, you can access all tests from this list. All tests are designed in the same way to ensure seamless control of the tests by measurement experts.



If you log on to a client where the QuantityWare BC set has not been activated (or after your four-week CTG test usage key has expired), you will not have access to the installation tests via the Gas Measurement Cockpit - without the configuration template delivered with the BC set, the installation test will run with errors due to missing configuration. Instead, you have access to the Technical Installation Test, which does not require the template data.



Now, you can start defining your own conversion group based test scenarios, which will ensure system stability and compliance within all required systems in your system landscape. Details can be found in the CTG Documentation Reference Manual

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