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# Uniguard

Version 2.04

## Getting Started

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# Preface

## Introduction

Welcome to Uniguard, the software that allows you to perform healthcare monitoring of your CheckSonic™, FlareSonic™, MicroSonic™, P.Sonic®, Q.Sonic® or TwinSonic™ gas flow meter with your personal computer. Uniguard can only be used with meters with series III, IV, or IV.a electronics.

## Warranty

All software provided to purchaser is provided on an as-is basis. Elster-Instromet NV warrants that the program and media shall be free from defects in material and faulty workmanship. The warranty provisions stipulated in the manufacturer's general **Terms of Delivery** are applicable to the product.

The entire risk as to the quality and performance of the software is with the purchaser. Except as stated in the manufacturer's general **Terms of Delivery**, should the software programs or any adaptations thereof prove defective, purchaser assumes the entire cost of all necessary servicing or repair or correction, and any incidental damages. In no event will Elster-Instromet NV be liable for direct, indirect, incidental or consequential damages resulting from:

- ◆ a defect in the software, or
- ◆ the unintentional or deliberate misuse of the software.

## What Is Uniguard?

Uniguard is a software tool which allows easy healthcare monitoring of an ultrasonic gas flow meters from Elster-Instromet. It is recommended to perform a health care monitoring of your UFM on a regular basis (e.g. weekly or monthly). Using UniGuard on a regular basis can detect certain malfunctions before they develop into real problems. In addition the long term stability of the ultrasonic meter can be monitored.

UniGuard allows you to calculate physical properties, e.g. velocity of sound, density, superior calorific value, ... These calculations are made according to generally accepted standards: AGA 8 / 10 and ISO 6976.

## What You Need to Run Uniguard

The minimum system requirements to run UNIGUARD are:

- ◆ Windows XP service pack 2 or Vista.
- ◆ When Excel 2003 is used: Pentium IV 500MHz, 1 GB RAM and 1.8 GB free disk space
- ◆ When Excel 2007 is used: Pentium IV 500 MHz, 1.5 GB RAM and 2.66 GB free disk space
- ◆ Free disk space, should be minimum 500 MB
- ◆ No license is required for Uniguard
- ◆ .Net Framework 3.5 service pack 1 is required (this included in the package)
- ◆ Screen resolution of 1024x768 or higher.
- ◆ One free serial port (RS232 or TCP/IP depending on the connection settings with the UFM)
- ◆ An appropriate RS485 converter/interface when connecting to the UFM over longer distances. If necessary this can be obtained through Elster-Instromet NV.

**Typographical Conventions**

To help you locate and interpret information easily, this manual employs consistent visual cues, and a few standard text formats. You will find the following typographic conventions throughout this manual.

<u>Type Style</u>	<u>Meaning</u>
<i>Italic</i> or <b>bold</b>	Used to emphasise a word or phrase.
Initial Capitals	Menu items, command names, and dialog box names and options, for example, File Menu, or Save Command.
<Key>	The names of keys on a keyboard, for example <Esc>.
"command"	Typewriter style denotes text or characters that are to be literally input from the keyboard, and for responses from a device, for example a PC, or a flow meter.
<u>Symbol</u>	<u>Meaning</u>
▶	Signals the beginning of a procedure.
■	Signals a procedure that has only one step. Also used to signal the end of a multi-step procedure.
❶ ❷ ❸ ...	Signal the steps of a procedure.

**Terminology**

The following terms take on special meanings in the context of UNIGUARD. Your familiarity with them will make the concepts and procedures presented in this guide and in On-line Help easier to understand.

**Choose:** To use a mouse or key combination to pick an item that begins an action in Uniguard.

**Click:** To quickly press and release the mouse button.

**Select:** To mark an item by highlighting it with key combinations or by clicking it with a mouse.

**Window:** A rectangular region of the screen containing a set of controls that accept input from the user and display information to the user. Windows can perform many different functions, from representing the front panel of an instrument to allowing you to select a filename.

# 1 Installing Uniguard

## 1.1 Introduction

This section details the installation procedure. Follow the instruction carefully.

## 1.2 Pre-installation instructions

- ❶ Install latest windows updates.
- ❷ If you have an existing Uniguard installation on your computer you need to uninstall any old version before installing a new version. Also remove all earlier (than version 3.5) .NET Framework versions, if they are installed on your PC.
- ❸ If you are installing from a memory stick, create a folder on the desktop, copy the installation files to the newly created folder and run the setup files from there. This folder may be deleted after the setup is complete.

## 1.3 Installing Uniguard

- ❶ Install .NET 3.5 Framework .NETFX35.exe in UniGuard Installation folder.  
This will approximately take 10 minutes to complete. The progress bar will stall for a period, please be patient, you will receive a message to restart after the .NET install is complete.
- ❷ Install UniGuard Application (Setup.exe in UniGuard Installation folder).  
This will take from 3-7 minutes to complete. You will receive a message for a password, this should be ignored. When the installing is complete, you'll be asked to re-start the PC.

## 1.4 Setup Excel

### 1.4.1 Excel 2007

**Note:**

This procedure **must** be performed **before** UniGuard is started for the first time for Excel 2007 users.

## Installing Uniguard

- 1 Open Excel 2007, click on the <Office button> and <Excel options>.



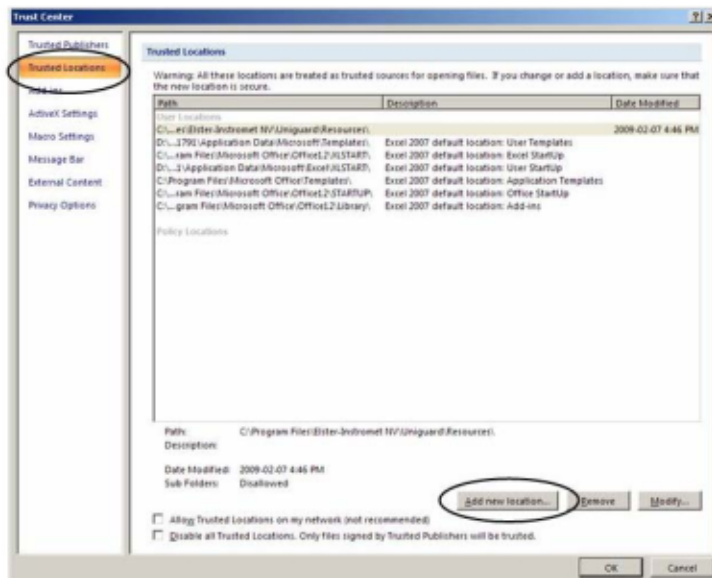
- 2 Click <Trust Center> and <Trust Center Settings>.



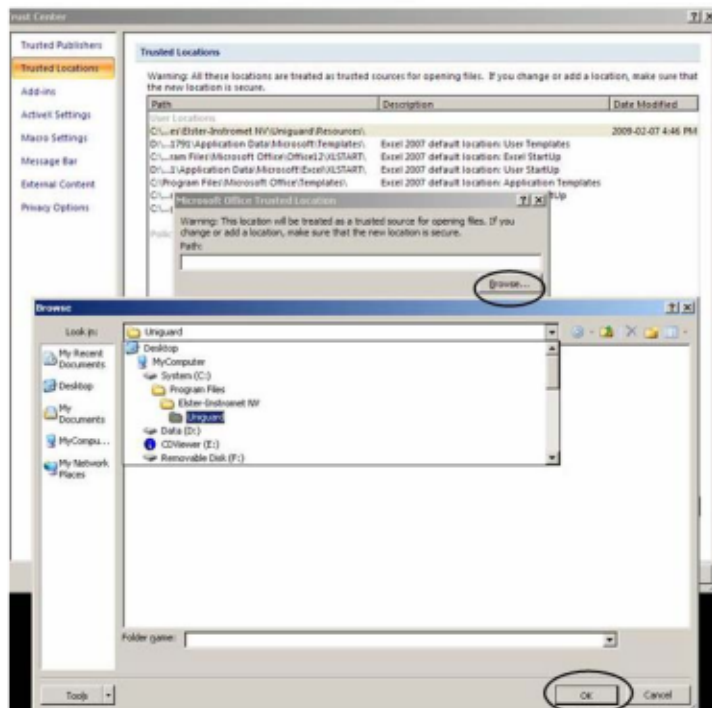


## Installing Uniguard

- Click <Trusted Locations> and <Add New Location>.

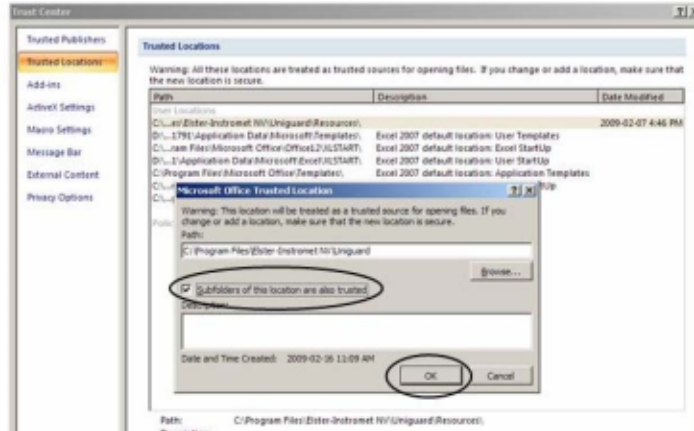


- Click <Browse>, and browse to: C:\Program Files\Elster-Instromet NV\Uniguard and click <OK>.



## Installing Uniguard

- 5 Check if <Subfolder of this location are also trusted> is ticked and click <OK>.

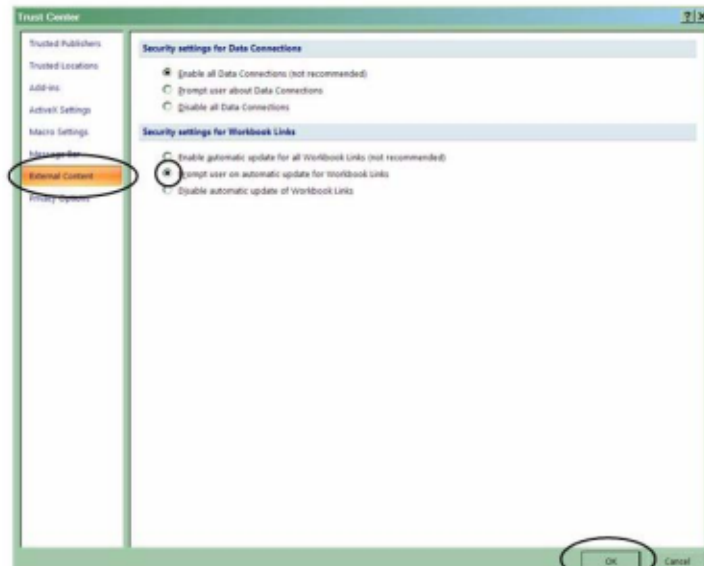


- 6 Click <Macro Settings> and <Enable all macros>.



## Installing Uniguard

- 7 Click <External Content>, <Enable all Data Connections> and <OK>.

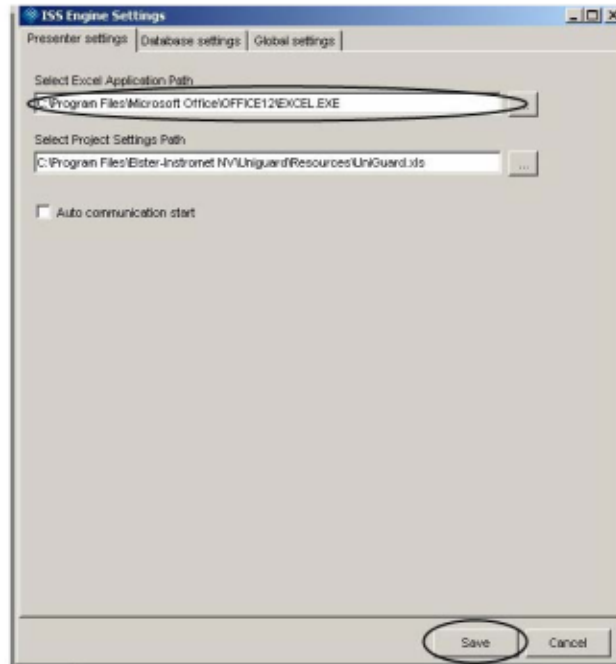


At the next screen click <OK> and close Excel 2007.

- 8 Start Uniguard from the shortcut on the desktop. When this is opened, right click the <ISS Engine icon> in the system tray and click <Settings>



- 9 Change the Excel Application Path:  
 from: C:\Program Files\Microsoft\Office\Office11\EXCEL.EXE  
 to: C:\Program Files\Microsoft\Office\Office12\EXCEL.EXE  
 And click <Save>.



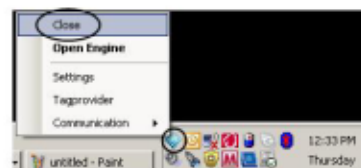
**Note:**

These locations listed above are the default locations for the Excel application. The location of the Excel.exe file may be different on some computers.

To determine the location of the Excel application on a computer when it is not installed in default location you can use the Windows search utility (press F3) or select the start button and select the search utility. Search for the **Excel.exe** files and folders (including sub-directories) in My Computer. Once you have located the folder where the Excel.exe application is located type that in the Select Excel Application Path screen above.

If you encounter difficulties with the search for the Excel.exe file, you might consider consulting your IT Department.

- 10 Right click on the <ISS Engine icon> in the system tray and click <Close>. Answer <Yes> to close Dialog.

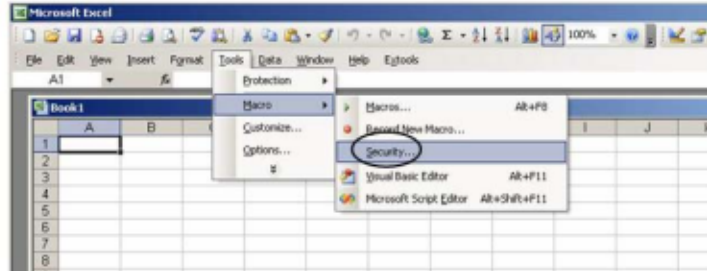


Now Uniguard is ready to run.

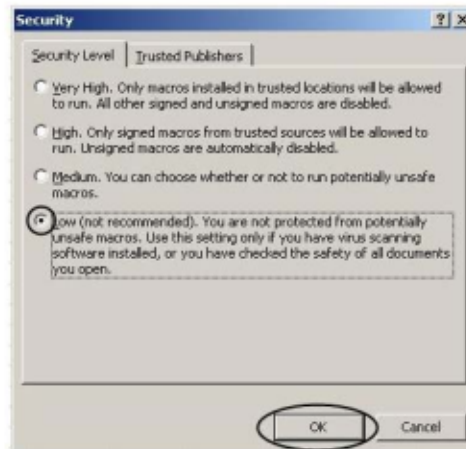
## Installing Uniguard

### 1.4.2 Excel 2003

- 1 Start Excel 2003, click <Tools>, select <Macro> and <Security>



- 2 Click <Low> and <OK>.



- 3 Quit Excel 2003 and Uniguard is ready to run.

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**Installing Uniguard**

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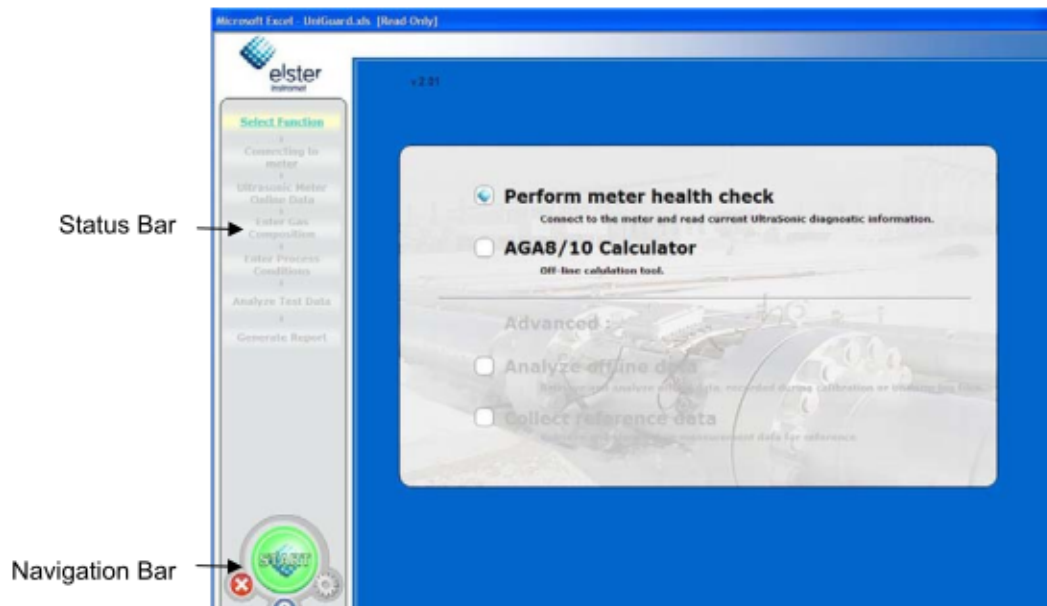
# 2 Using Uniguard

## 2.1 Introduction UNIGUARD

When the normal installing procedures are followed, Uniguard is installed at: C:\Program Files\Elster-Instromet NV\Uniguard.

When using Uniguard, it's recommended to have no other excel files open.

A shortcut should have been generated on the desktop, use this to start Uniguard. Alternatively you can run UniGuard from the Start menu Figure 2-1 will appear on the screen:



**Figure 2-1:** Opening screen

On the left of the screen is the **menu bar**. This is divided in 2 different areas:

### 2.1.1 Status bar

Highlights each step of the procedure during the health care monitoring or AGA 8/10 calculation.

### 2.1.2 Navigation bar

Allows you to proceed step by step through Uniguard.

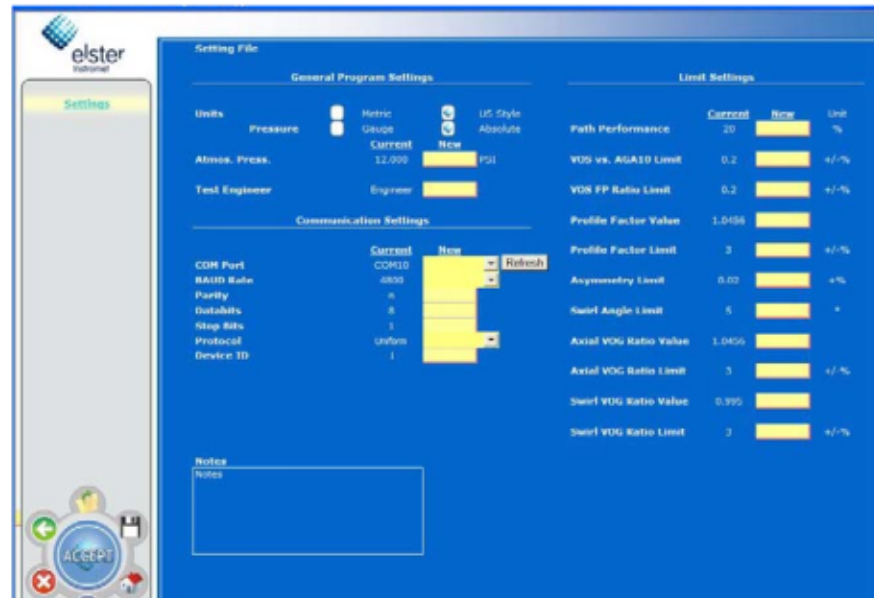
## 2.2 Modify settings

Before starting with the health care monitoring or the AGA 8/10 calculator, modify Uniguard to the desired settings.

### ► Modify settings



- ❶ When Uniguard is start-up, Figure 2-1 appears. Go to the "Navigation bar" and click on the indicated Button. Following window, Figure 2-2, will appear.



**Figure 2-2: Setting File**

- 2 Modify all the settings to the desired values.

Make sure the "Communication Settings" are filled in correctly, otherwise communication with the flowmeter will not be possible! If your used COM Port is not listed, click the "Refresh" button and all the current used COM Ports of the PC will be listed.

By using the buttons on the "Navigation bar", it is possible to save your settings, so they can easily be loaded at the next session.



- 3 When the settings are filled in correctly, click <ACCEPT> at the "Navigation bar".  
A pop-up will appear, to confirm the settings. Click <OK>.
- 4 Go back to the main screen (Figure 2-1) by pressing the left arrow button in the "Navigation bar".  
(This button allows you during the entire health care check to go back to the previous step).

**Note:**

For each application specific Limit settings can be entered and stored. Setting those more accurate for a certain application improves the quality and reliability of the health care check. The default limits however provide a good start.

Changing the limits has only an effect on the Uniguard health check report. No real alarms will or can be altered through Uniguard.



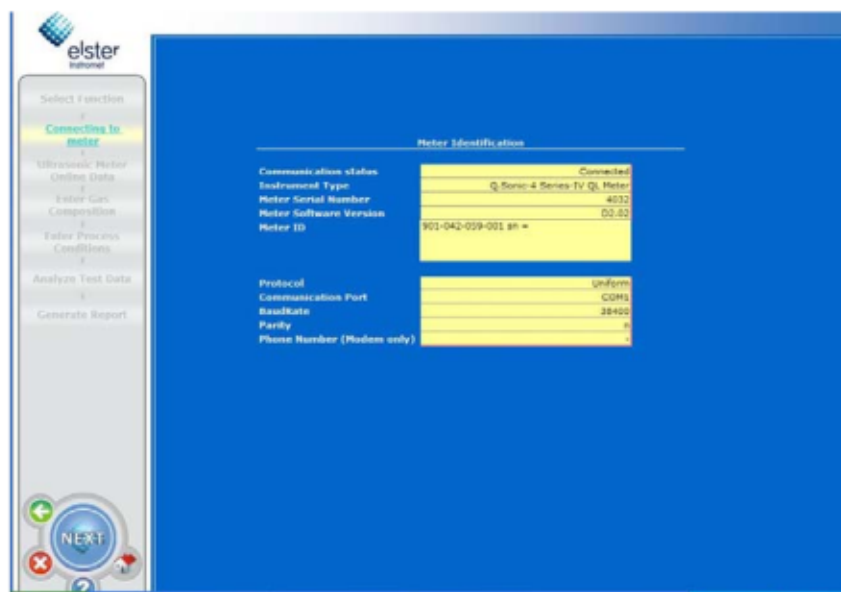
### 2.3 Perform meter health check

#### ▶ Meter health check



- ❶ Open Uniguard and ensure the settings are correct (see chapter: 2.2).
- ❷ When the main screen as seen in Figure 2-1 is displayed, select <Perform meter health check>. Proceed to the next step by clicking <START> at the "Navigation bar".

#### ❸ CONNECTING TO METER (Figure 2-3).



**Figure 2-3:** Connecting to meter



If the connection setting are filled in correctly at the Setting step (see 2.2), Uniguard will connect to the meter automatically and the meter data is displayed, see also Figure 2-3.

Proceed by clicking <NEXT> at the "Navigation bar".

4 **ULTRASONIC METER ONLINE DATA** (Figure 2-4)



**Figure 2-4: Ultrasonic Meter Online Data**



Uniguard displays the most relevant data of the UFM on the screen. The health care check can be started by clicking <NEXT> at the "Navigation bar". Uniguard will now start logging for 2 minutes. This logfile is used for the health care check.



The status of the logging is visualised at the "Data Progress bar" above the "Navigation bar". When the logging is done, continue to the next step by pressing <NEXT> at the "Navigation bar".

**Note:**

To have a better visualization of the flow profile in the meter, the axial paths are always presented in the middle of the graph. This is also the case for the report (see chapter 3).

For reliable results make sure you start logging data when the flow is stable, both gas velocity and Velocity of sound. During the two minutes it is important that the application remains stable as well. Uniguard will indicate a warning when the gas velocity exceeds the limits (red horizontal bars in the Gas Velocity trend).

When the gas velocity is low, Uniguard will indicate a warning message. A health care check is still possible, however keep in mind that some criteria (e.g. Path Velocity Ratios) may exceed the normal limit values.

5 ENTER GAS COMPOSITION (Figure 2-5)

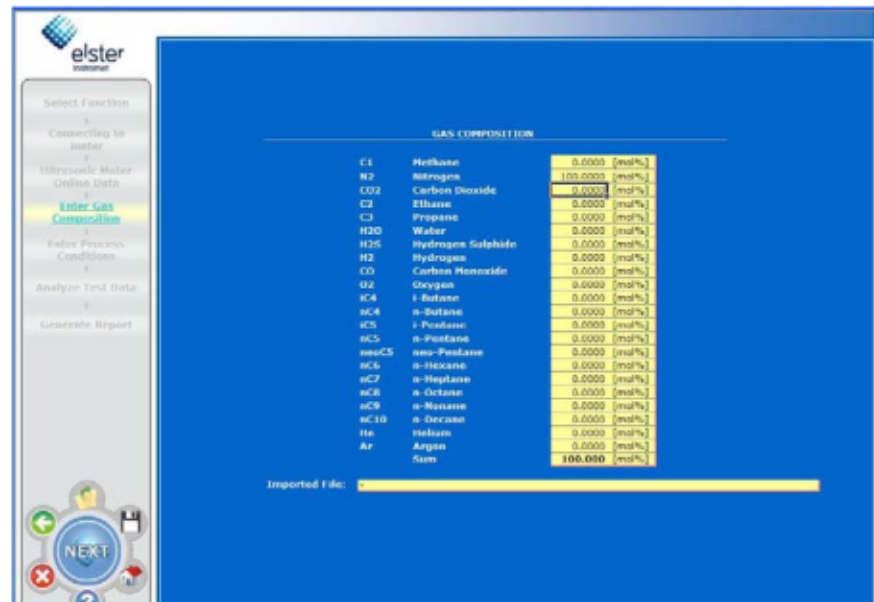


Figure 2-5: Enter Gas Composition



Fill in the gas composition.

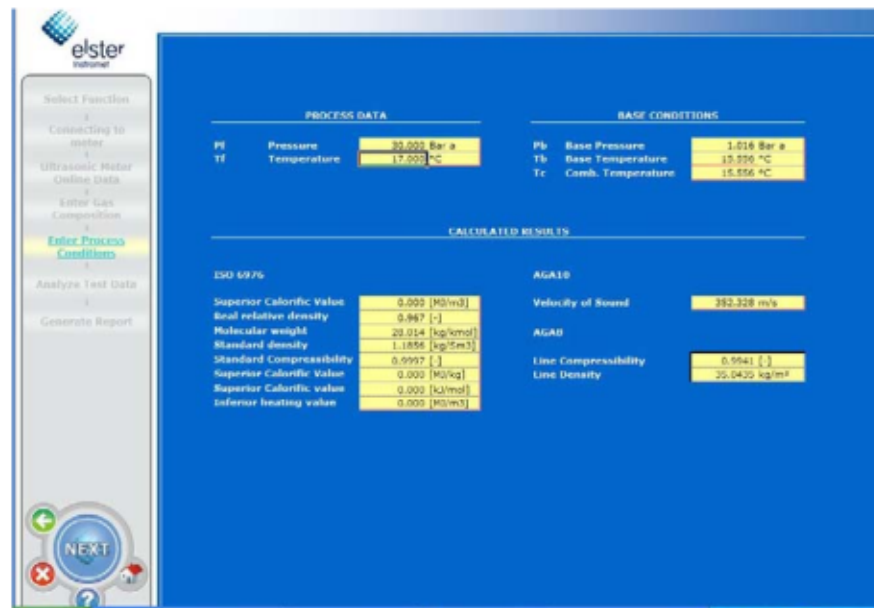
By using the buttons on the "Navigation bar", it is possible to save/load your gas composition to/from a CSV file. In addition a Emerson / Daniel CSV file can be imported

When gas composition is filled in correctly, proceed by clicking <NEXT> at the "Navigation bar".

**Note:**

The composition of your gas may change during a longer period of time. A reliable Velocity of Sound check is only possible when the **exact** gas composition at the time of performing the UniGuard health check is known!

**6** ENTER PROCESS CONDITIONS (Figure 2-6)



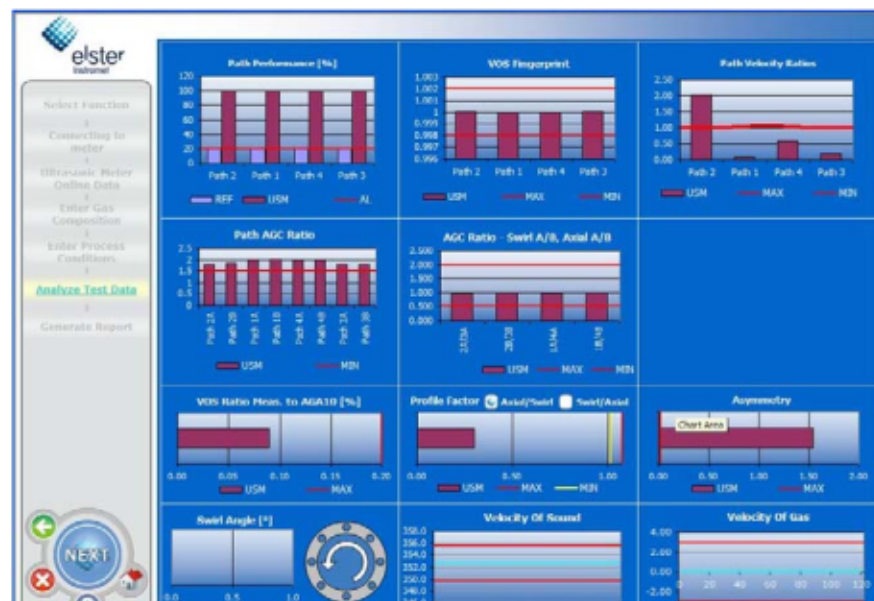
**Figure 2-6: Enter Process Conditions**

Enter the process – and the base conditions, the most relevant physical properties will be calculated.

Proceed by clicking <NEXT> at the "Navigation bar".



**7** ANALYSE TEST DATA (Figure 2-7)



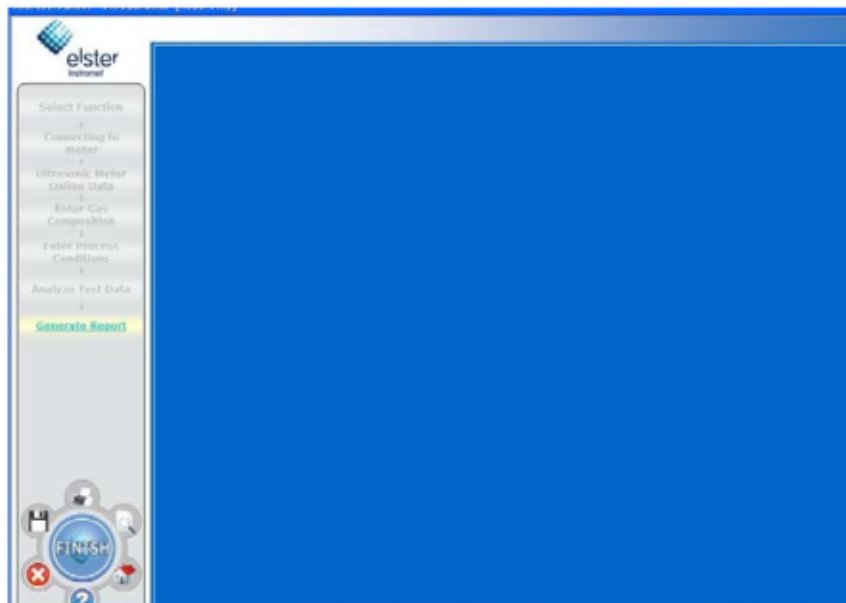
**Figure 2-7: Analyze Test Data**



All the gathered data is now analysed and compared to the preset limits (see chapter 2.2).

Proceed by clicking <NEXT> at the "Navigation bar".

**8** GENERATE REPORT (Figure 2-8)



**Figure 2-8:** Generate Report



The "Navigation bar" can now be used to save, print or preview the health care report. When a report is saved a confirmation window will pop-up, containing the name and place of the report.

An example of a report is shown chapter 3. This contains 4 pages containing:

- Page 1: Parameter set-up of the UFM
- Page 2: Test results of the health check
- Page 3: Test results of the health check, visualized in graphs.
- Page 4: AGA 8/10 calculation

**Note**  
A printer needs to be installed on the PC to be able to generate the report. When the printer installed is a black and white printer, the preview report is displayed in greyscales.



**9** QUIT UNIGUARD

Quitting Uniguard is done by pressing the Quit – button at the "Navigation bar". A confirmation window will pop-up, press <OK> to Quit.

**Note**  
Closing Uniguard can take some time!

**2.4 Analyze results meter health check**

All the following checks are visualized in page 3 of the health care check report (see chapter 3)

**2.4.1 Path Performance**

Number of approved signals compared to the number of sent out signals. This decreases with higher gas velocities. When it drops below 20% all the pulses (including the approved) will be dismissed. Limits can be altered.

**2.4.2 VOS Fingerprint (Footprint)**

Velocity Of Sound of each path compared to the overall Velocity Of Sound. Limits can be altered.

**2.4.3 Path Velocity Ratios**

Velocity Of Gas of each path compared to the overall Velocity Of Gas. With normal flow profiles the axial paths should have a slightly higher ratio (around 4%) than the swirl paths. Limits can be altered.

**2.4.4 Path AGC Ratio**

AGC limit of each transducer compared to the AGC level of that transducer. This will decrease with higher gas velocities. When this drops to 1 (AGC limit = AGC level), it's no longer possible to measure. Limits are fixed.

**2.4.5 AGC Ratio – Swirl A/B, Axial A/B**

The AGC ratio each transducer compared to the AGC ratio of the transducer with the same path type (axial or swirl) and of the same side (A or B). This should be close to 1. Limits are fixed.

**2.4.6 VOS Ratio Meas. to AGA10[%]**

Overall VOS compared to the calculated VOS. This is only possible if the exact gas composition is known. If it's not known, ignore this result. Limits can be altered.

**2.4.7 Profile Factor [Ax/Sw]**

Velocity Of Gas of the Axial paths compared to the Velocity Of Gas of the swirl paths (or visa versa). With a normal flow profile the axial path should be around 4% higher as the swirl paths. Limits can be altered.

**2.4.8 Asymmetry**

Velocity Of Gas of the axial paths compared to each other. When they are not close to each other, asymmetry might be in the flow profile. Limits can be altered.



### 2.4.9 Swirl Angle [°]

Velocity Of Gas of the swirl paths compared to each other. When they are not close to each other, swirl might be in the flow profile. The picture next to the graph in the report (see paragraph 3) shows the direction of the swirl. Limits can be altered.

### 2.4.10 Velocity Of Sound

A graph with the Velocity Of Sound of each path during the entire logfile is shown.

### 2.4.11 Velocity Of Gas

A graph with the Velocity Of Gas of each path during the entire logfile is shown.

## 2.5 AGA 8 /10 Calculation



### ▶ AGA 8/10 Calculation



- ❶ Open Uniguard and ensure the settings are correct (see chapter: 2.2).
- ❷ Select <AGA 8/10 Calculation> from the main menu, see also Figure 2-1. Proceed to the next step by clicking <START> at the "Navigation bar".
- ❸ ENTER GAS COMPOSITION (Figure 2-5)  
See Paragraph 2.3, step 5
- ❹ ENTER PROCESS CONDITIONS (Figure 2-6)  
See Paragraph 2.3, step 6
- ❺ GENERATE REPORT (Figure 2-8)  
See Paragraph 2.3, step 8  
  
The report contains only 2 pages:  
Page 1: parameter set-up of the UFM  
Page 2: AGA 8/10 calculation
- ❻ QUIT UNIGUARD  
See Paragraph 2.3, step 9

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3

# Example: Uniguard report

<p><b>Start Time</b> 23-Apr-2009 11:36:52</p> <p><b>End Time</b> 23-Apr-2009 11:38:53</p> <p><b>Test Engineer</b> ASTE</p> <p><b>Site File Name</b> v.2.04</p> <p><b>UniGuard Version</b></p>	<p><b>METER SPECIFICATION</b></p> <p><b>Meter Identification</b> Q-Sonic-V Series-IV QL Meter</p> <p><b>Instrument Type</b> 2594</p> <p><b>Meter Serial Number</b> D1.04</p> <p><b>Meter Software Version</b> SPU S.M5002 (901-42-051001)</p> <p><b>Meter ID</b></p>	<p><b>Density</b> 45,000 kg/m<sup>3</sup></p> <p><b>Dynamic Viscosity</b> 0,000 Pa.s</p> <p><b>V...module Parameters</b></p> <p>Lower Limit Speed Of Sound 300,00 m/s</p> <p>Upper Limit Speed Of Sound 500,00 m/s</p> <p>Lower Limit Velocity Of Gas -40,00 m/s</p> <p>Upper Limit Velocity Of Gas 40,00 m/s</p> <p>Sample Rate 15,00</p> <p>Timing Constant 1 590,00</p> <p>Timing Constant 2 590,00</p> <p>Timing Constant 3 0,00</p> <p>Pulse Length 20,00</p>	<p><b>Calibration Parameters</b></p> <p>Coefficient Row 1 0,1590</p> <p>Coefficient Row 1 0,8410</p> <p>Coefficient Row 1 0,0080</p> <p>Coefficient Row 1 0,0000</p> <p>Coefficient Row 2 0,0300</p> <p>Coefficient Row 2 0,0300</p> <p>Coefficient Row 2 0,0500</p> <p>Coefficient Row 2 0,0000</p> <p>Coefficient Row 3 0,0050</p> <p>Coefficient Row 3 0,0000</p> <p>Coefficient Row 3 0,0060</p> <p>Coefficient Row 3 0,0000</p> <p>Coefficient Row 4 0,0300</p> <p>Coefficient Row 4 0,0000</p> <p>Coefficient Row 4 0,0000</p> <p>Coefficient Row 4 0,0000</p> <p>Coefficient Row 5 1,0000</p> <p>Coefficient Row 5 0,0000</p> <p>Coefficient Row 5 0,0000</p> <p>Coefficient Row 5 1,0000</p> <p>Coefficient Row 6 0,0000</p> <p>Coefficient Row 6 0,0000</p>
<p><b>Software Information</b></p> <p>Protocol Uniform</p> <p>Modbus Address COM2</p> <p>BaudRate 38400</p> <p>Parity n</p> <p>Phone Number (Modem connection only) -</p>	<p><b>Profile Correction</b></p> <p>Asial Path Coefficient 1 3792,0000</p> <p>Asial Path Coefficient 2 26,0000</p> <p>Asial Path Coefficient 3 0,7502</p> <p>Asial Path Coefficient 4 0,9711</p> <p>Asial Path Coefficient 5 0,0231</p> <p>Asial Path Coefficient 6 -3,3190</p> <p>Switl Path Coefficient 1 3401,0000</p> <p>Switl Path Coefficient 2 66,0000</p> <p>Switl Path Coefficient 3 1,0037</p> <p>Switl Path Coefficient 4 1,0020</p> <p>Switl Path Coefficient 5 0,0375</p> <p>Switl Path Coefficient 6 -3,2050</p>	<p><b>Adjust Factor Parameters</b></p> <p>Adjust Mode 1,0000</p> <p>Adjust Factor Forward 0,0000</p> <p>Adjust Factor Reverse 0,0000</p> <p>Algorithm Coefficient forward 0 0,0000</p> <p>Algorithm Coefficient forward 1 0,0000</p> <p>Algorithm Coefficient forward 2 0,0000</p> <p>Algorithm Coefficient Reverse 0 0,0000</p> <p>Algorithm Coefficient Reverse 1 0,0000</p> <p>Algorithm Coefficient Reverse 2 0,0000</p>	<p><b>Low Pass Filter</b> Disabled</p> <p><b>Filter Mode</b> 0</p> <p><b>Time Constant</b></p> <p><b>Low Flow Cut Off</b> Disabled</p> <p><b>Cut Off Mode</b> 0,025 m/s</p> <p><b>Threshold</b></p> <p><b>Output Parameters</b></p> <p>Frequency Output Mode 5</p> <p>Frequency Output Value Range 0 - 9000 m/h</p> <p>Frequency Range 0 - 3000</p> <p>Meter Factor 1200 Pulses/m<sup>3</sup></p>
<p><b>Meter Parameters</b></p> <p>Setup Parameter 1 0</p> <p>Setup Parameter 2 0</p> <p>Setup Parameter 3 0</p> <p>Setup Parameter 4 0</p> <p>Setup Parameter 5 0</p> <p>Setup Parameter 6 0</p>	<p><b>Spoolpiece Parameters</b></p> <p>Spoolpiece diameter 0,289 m</p> <p>Path Length path 1 0,782 m</p> <p>Path Angle path 1 50,77 °</p> <p>Path Length path 2 0,875 m</p> <p>Path Angle path 2 63,44 °</p> <p>Path Length path 3 0,875 m</p> <p>Path Angle path 3 63,44 °</p> <p>Path Length path 4 0,781 m</p> <p>Path Angle path 4 50,77 °</p> <p>Path Length path 5 0,000 m</p> <p>Path Angle path 5 0 °</p>		

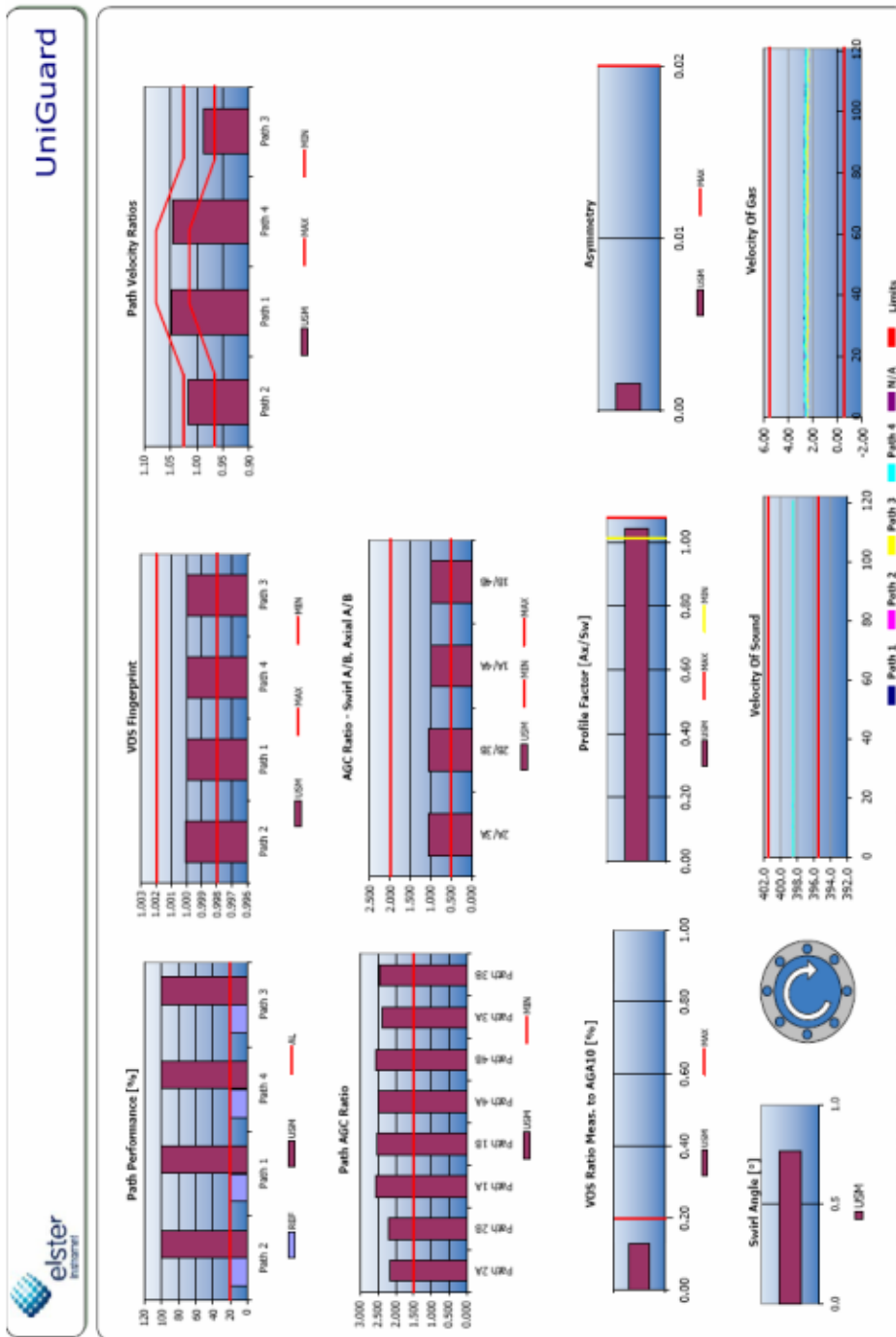
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TEST		Limit	Measured	Status	TEST		Limit	Measured	Status
<b>Performance</b>									
Number of acquired samples			9		Automatic Gain Control				
Percentage accepted pulses Path 1		20.00	100	PASS	Axial Path Level Ratio		Min	Max	
Percentage accepted pulses Path 2		20.00	100	PASS	1A/4A		0.5	2.0	0.99
Percentage accepted pulses Path 3		20.00	100	PASS	1B/4B		0.5	2.0	1.00
Percentage accepted pulses Path 4		20.00	100	PASS			0.5	2.0	-
Percentage accepted pulses Path 5		N/A	-	N/A			0.5	2.0	-
							0.5	2.0	-
<b>Velocity of Sound</b>									
AGA 10 Calculated		396.49 m/s			Swirl Path Level Ratio		0.5	2.0	1.07
		397.024 m/s			2A/3A		0.5	2.0	1.07
					2B/3B				PASS
Deviation VOS Average to Path 1		0.2 %	0.00 %	PASS	Elevated Level				
Deviation VOS Average to Path 2		0.2 %	0.00 %	PASS	Path 1A		40.000	17394	PASS
Deviation VOS Average to Path 3		0.2 %	0.00 %	PASS	Path 1B		40.000	17311	PASS
Deviation VOS Average to Path 4		0.2 %	0.00 %	PASS	Path 2A		40.000	19820	PASS
Deviation VOS Average to Path 5		0.2 %	- %	N/A	Path 2B		40.000	19589	PASS
					Path 3A		40.000	18469	PASS
					Path 3B		40.000	18304	PASS
Deviation Avg VOS Measured to AGA10		0.2 %	0.13 %	PASS	Path 4A		40.000	17511	PASS
					Path 4B		40.000	17331	PASS
					Path 5A		40.000	-	N/A
					Path 5B		40.000	-	N/A
<b>Velocity of Gas</b>									
Deviation VOG Average to Path 1		3 %	-0.15 %	PASS	Limit/Level Ratio		1.5	2.58	PASS
Deviation VOG Average to Path 2		3 %	-2.16 %	PASS	Path 1A		1.5	2.60	PASS
Deviation VOG Average to Path 3		3 %	0.75 %	PASS	Path 1B		1.5	2.11	PASS
Deviation VOG Average to Path 4		3 %	0.00 %	PASS	Path 2A		1.5	2.09	PASS
Deviation VOG Average to Path 5		3 %	- %	N/A	Path 2B		1.5	2.31	PASS
					Path 3A		1.5	2.37	PASS
Profile Factor (AX/SW)		3 %	0.13 %	PASS	Path 3B		1.5	2.57	PASS
					Path 4A		1.5	2.63	PASS
					Path 4B		1.5	-	N/A
Swirl Angle		±	0.8 °	PASS	Path 5A		1.5	-	N/A
Swirl Angle		±	0.8 °	PASS	Path 5B		1.5	-	N/A
<b>Asymmetry</b>									
Asymmetry		0.02	0.00	PASS	Level A vs. B Mismatch		0.5	2.0	1.00
					Path 1		0.5	2.0	1.01
					Path 2		0.5	2.0	1.01
					Path 3		0.5	2.0	1.01
					Path 4		0.5	2.0	1.01
					Path 5		0.5	2.0	N/A

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UniGuard





Gas Composition		mol %	AGAI0	Notes
C1	Methane	89.3900	Velocity of Sound	397.824 m/s
N2	Nitrogen	0.6000	<b>AGAB</b>	
CO2	Carbon Dioxide	1.7400	Line Compressibility	0.8238
C2	Ethane	6.3700	Line Density	25.1794 kg/m³
C3	Propane	1.2600		
H2O	Water	0.0000		
H2S	Hydrogen Sulphide	0.0000		
H2	Hydrogen	0.0000		
CO	Carbon Monoxide	0.0000	<b>ISO 6976</b>	
O2	Oxygen	0.0000	Superior Calorific Value	39.81 [MJ/m3]
IC4	i-Butane	0.1350	Real relative density	0.6259
nC4	n-Butane	0.1600	Molecular weight	18.091 [g/mol]
IC5	i-Pentane	0.0010	Standard density	0.7673 [kg/Sm3]
nC5	n-Pentane	0.0270	Standard Compressibility	0.9975
neoC5	neo-Pentane	0.0000	Superior Calorific Value	51.89 [MJ/kg]
nC6	n-Hexane	0.1000	Superior Calorific value	938.71 [J/mol]
nC7	n-Heptane	0.0000	Inferior heating value	35.94 [MJ/m3]
nC8	n-Octane	0.0000		
nC9	n-Nonane	0.0000		
nC10	n-Decane	0.0000		
He	Helium	0.0000		
Ar	Argon	0.0000		
	Sum	100.0000		
<b>Process Conditions</b>				
PT	Pressure	30.596 Bar a		
TT	Temperature	13.650 °C		
<b>Base Conditions</b>				
Pb	Base Pressure	1.016 Bar a		
Tb	Base Temperature	15.556 °C		
Tc	Comb. Temperature	15.556 °C		

