SIEMENS

SITRANS CV

Version 3.10

15.07.2014

This document contains:

- overview of variants
- required calibration gases
- available configurations (country specific setups & extended applications)
- assistance for optimization error and choosing calculation standard

CAUTION
SITRANS CV is delivered and factory prepared with required carrier gas and defined calibration gas It is forbidden to switch to an other carrier gas. **Operating device with different carrier gas to delivered solution causes damage of analytical module.** Insufficient knowledge of the operating instructions, or the complete absence thereof, result in the deletion of all liability claims with regard to SIEMENS AG. Loading setups predestined for other type of analytical module or software version causes malfunction of device. If you have changed parameters unintentionally and wish to restore the factory parameters, reload the parameters from Parameter Backup CD into the gas chromatograph. The device is delivered with deactivated detectors. After device installation according to manual chapter 5 activate detectors by checking the following checkboxes: CVControl > DeviceSetup > Hardware > Detectors > Bridge Initial **Unppropriate change of detector voltage may cause damage of analytical module.** If chromatograph signals an "Optimization Error" not all peaks are detected which are referenced for the optimization - see manual.

Technical support

Contact the hotline:
Tel: +49 (0)911 895 7 222
Fax: +49 (0)911 895 7 223

Alternatively you can place a Support Request:
Internet link: http://www.siemens.de/automation/service&support
E-Mail: support.automation@siemens.com

SITRANS CV
Overview of variants, available configurations and required calibration gases

Carrier Gas Analytical Module	He C-09 Enhanced C6+		He C-01 Enhanced C6+ with Oxygen		Basic Bio-CH4		Ar C-01 Enhanced Bio-CH4		He C-13 C6+ Backflush	
Order code	7KQ3105-0		7KQ 3105-1				7KQ 3105-2		7KQ 3105-3	
	Default calculation standard is ISO 6976 GOST and AGA8 are selectable.									
Hydrogen	-		-		-		M	CR	-	
Oxygen	-		M	CR	M	CR	M	CR	-	
Nitrogen	M	CR	M	CR	M	CR	M	CR	M	CR
Carbon Dioxide	M	CR	M	CR	M	CR	M	CR	M	CR
Methane	M	CR	M	CR	M	CR	M	CR	M	CR
Ehane	M	CR	M	CR	-		M	CR	M	CR
Propane	M	CR	M	CR	-		M	CR	M	CR
Isobutane	M	CR	M	CR	-		M	CR	M	CR
Butane	M	CR	M	CR	-		M	CR	M	CR
Neopentane	M*[1]		M*[1]		-		-		M*[1]	
Isopentane	M	CR	M	CR	-		-		M	CR
Pentane	M	CR	M	CR	-		-		M	CR
Group C6+	M*[2]	CR	M*[2]	CR	-		-		-	
Group C6+ BACKFLUSH	-		-		-		-		M*[2]	CR
	Extended Applications 7KQ 3105- B02									
Separate measurement of group C6 and group C7+	M*[3]	CR*[3]	M*[3]	CR*[3]	-		-		-	
Separate Groups C6, C7, C8, C9	M*[4]	CR*[4]	M*[4]	CR*[4]	-		-		-	

Haven't found your solution ? - please contact us :
gc_sales.support.i-ia@siemens.com

M - Measured
Operating device with different carrier gas to delivered solution causes damage of analytical module.
M*[1] - Neopentane is measured with relative response factor to Isopentane
M*[1] - for direct calibration of Neopentane see instruction
M*[2] - Group C6+ is measured with response factor from n-Hexane
M*[3] / CR*[3] - Groups C6 and C7+ are measured separately
and calibrated with n-Hexane and n-Heptane
M*[4] / CR*[4] - Group C6, Group C7, Group C8, Group C9 are measured separately
and calibrated with n-Hexane, n-Heptane, n-Octane, n-Nonane
M*[5] - Group C6+ BACK can be calibrated with n-Hexane or with certified natural gas
M*[7] - Methane is calculated as a balance to 100%, during calibration process component methane is
Depending on the calibration gas composition heating of the containing bottle might be necessary.

CAUTION ! Operating SITRANS CV with different carrier gas than delivered solution causes damage of analytical module and other failures.

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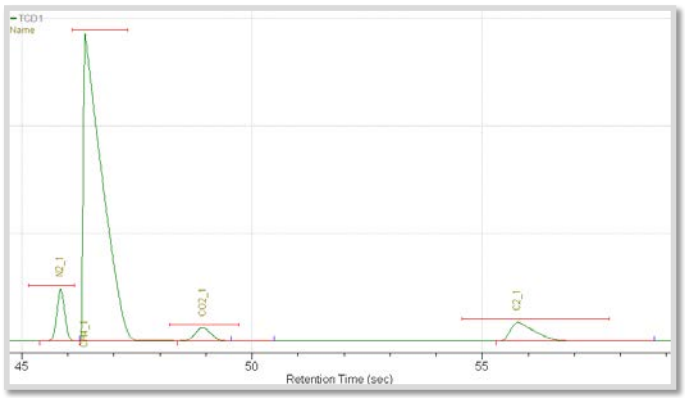
Analytical Module	**C09**
Software Version	3.10
Carrier Gas	Helium
Cycle Time	100s
Calculation Standard	Default setting ISO 6976

Calibration Gas	
Required Component	Recomended Concentration
Nitrogen	4,00
Carbon dioxide	1,50
Methane	88,95
Ethane	4,00
Propane	1,00
iso-Butane	0,20
n-Butane	0,20
neo-Pentane*[1]	
iso-Pentane	0,05
n-Pentane	0,05
n-Hexane*[2]	0,05

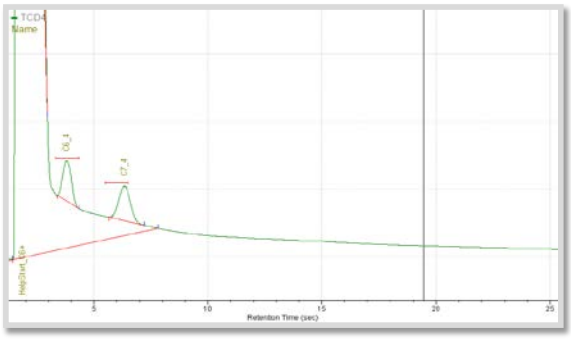
Measurement	
Component	Measuring range
Nitrogen	0-25
Carbon dioxide	0-20
Methane	50-100
Ethane	0-20
Propane	0-15
iso-Butane	0-10
n-Butane	0-10
neo-Pentane	0-1
iso-Pentane	0-1
n-Pentane	0-1
Group C6+	0-3

M*[1] - Neopentane is measured with relative response factor to Isopentane
M*[1] - for direct calibration of Neopentane see Manual - "4.2 Requirements for calibrating"
M*[2] - Group C6+ is measured with response factor from n-Hexane

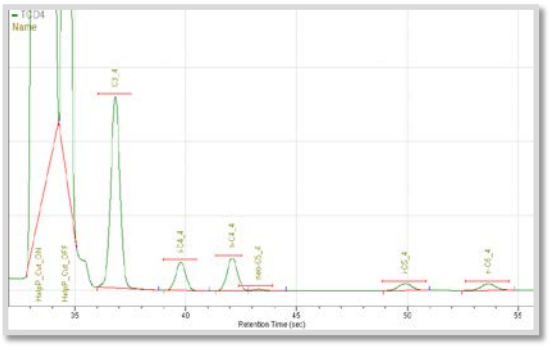
Signal observed at TCD 1



Signal observed at TCD 4a



Signal observed at TCD 4b



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Analytical Module	**C01**	
Software Version	3.10	
Carrier Gas	Helium	Quality 5.0
Cycle Time	150s	
Calculation Standard	Default setting ISO 6976	

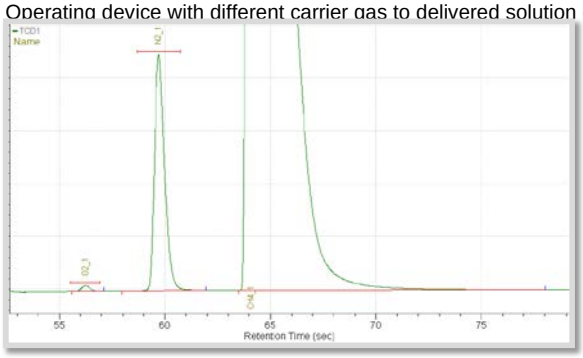
Calibration Gas Required Component	Concentration
Oxygen	0,50
Nitrogen	4,00
Carbon dioxide	1,50
Methane	88,45
Ethane	4,00
Propane	1,00
iso-Butane	0,20
n-Butane	0,20
neo-Pentane*[1]	
iso-Pentane	0,05
n-Pentane	0,05
n-Hexane*[2]	0,05

Measurement Component	Measuring range
Oxygen	0 - 4
Nitrogen	0 - 25
Carbon dioxide	0-20
Methane	50-100
Ethane	0-20
Propane	0-15
iso-Butane	0-10
n-Butane	0-10
neo-Pentane	0-1
iso-Pentane	0-1
n-Pentane	0-1
Group C6+	0-3

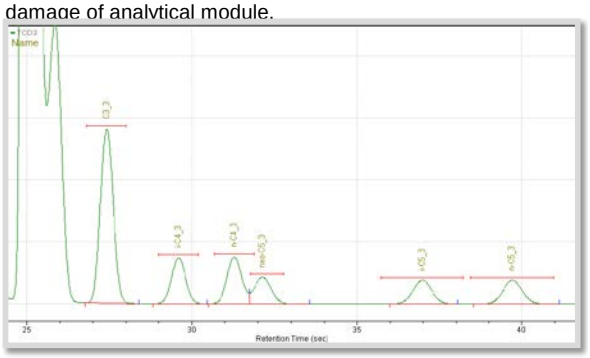
M*[1] - Neopentane is measured with relative response factor to Isopentane
M*[1] - for direct calibration of Neopentane see Manual - "4.2 Requirements for calibrating"
M*[2] - Group C6+ is measured with response factor from n-Hexane

Signal observed at TCD 1

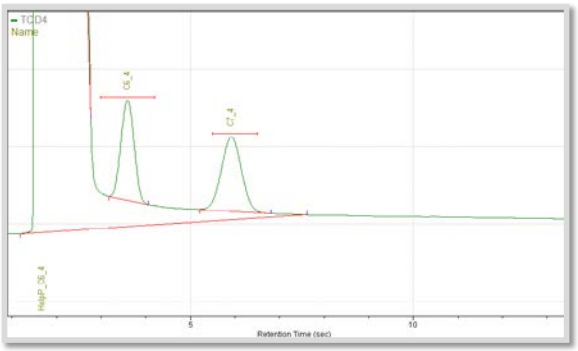
Operating device with different carrier gas to delivered solution causes damage of analytical module.



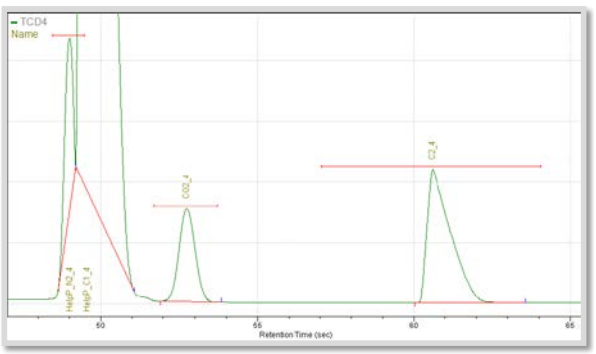
Signal observed at TCD 3



Signal observed at TCD 4a



Signal observed at TCD 4b



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Analytical Module	**C01**	
Software Version	3.10	
Carrier Gas	Helium	Quality 5.0
Cycle Time	150s	
Calculation Standard	Default setting ISO 6976	

Calibration Gas	
Required Component	Concentration
Oxygen	0,50
Nitrogen	4,00
Carbon dioxide	1,50
Methane	88,45

Measurement	
Component	Measuring range
Oxygen	0 - 4
Nitrogen	0 - 25
Carbon dioxide	0-20
Methane	50-100

Differences to default setting
Hydrocarbons higher than Mehane are not calibrated and measured
Detector TCD3 is not used and can be disabled
according to manual chapter 5 disable detector TCD3 by checking the following checkboxes:
CVControl > DeviceSetup > Hardware > Detectors > Bridge Initial

Loading a "country specific setup" or "extended application" causes a reconfiguration of the delivered system.

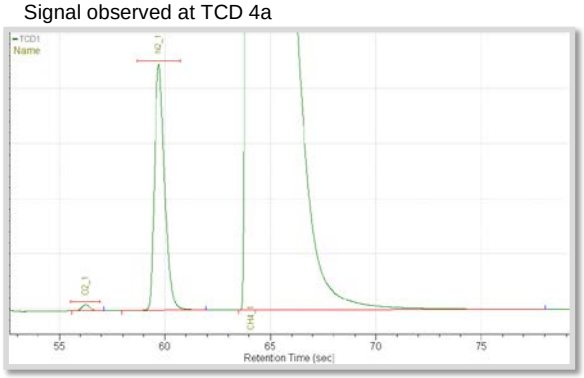
Before loading setup

carefully read SITRANS CV Control Software Manual
ensure that delivered configuration has not been changed
choose setup

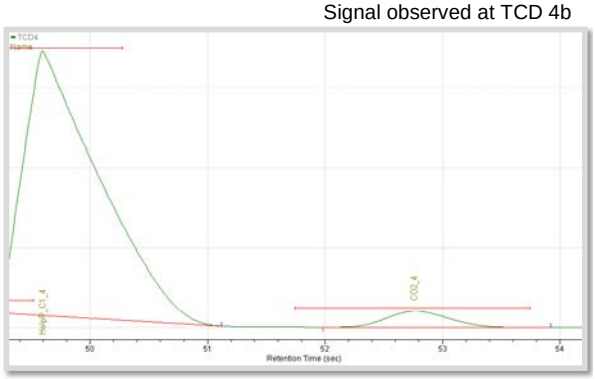
Choosing file:
Operating device with different carrier gas to delivered solution causes damage of analytical module.

check type of the analytical module integrated in the base unit
check software version

Signal observed at TCD 4a



Signal observed at TCD 4b



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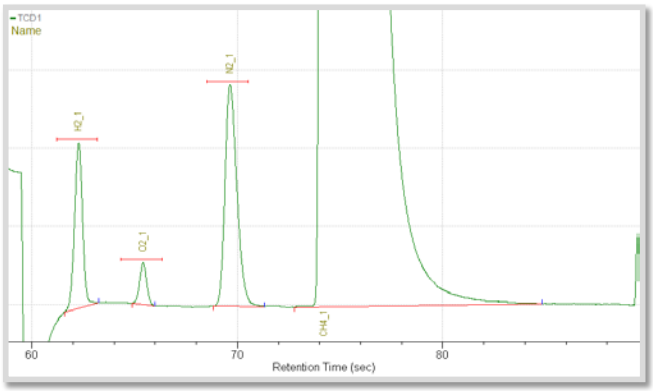
Analytical Module	**C01**
Software Version	3.10
Carrier Gas	**Argon !** Quality 5.0
Cycle Time	180s
Calculation Standard	Default setting ISO 6976

Calibration Gas	
Required Component	Recomended Concentration
Hydrogen	0,20
Oxygen	0,40
Nitrogen	4,00
Carbon dioxide	2,50
Methane	88,40
Ethane	2,50
Propane	1,00
iso-Butane	0,50
n-Butane	0,50

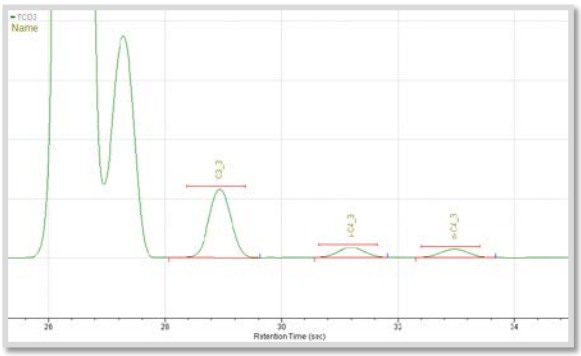
Measurement	
Component	Measuring range*
Hydrogen	0 - 2
Oxygen	0 - 3
Nitrogen	0 - 22
Carbon dioxide	0 - 12
Methane	55 - 100
Ethane	0 - 14
Propane	0 - 5
iso-Butane	0 - 0.9
n-Butane	0 - 1.8

* due to carrier gas Argon detection limit is constricted and depends on component
Operating device with different carrier gas to delivered solution causes damage of analytical module.

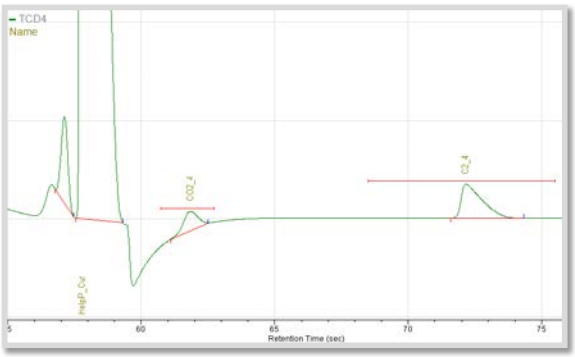
Signal observed at TCD 1



Signal observed at TCD 3



Signal observed at TCD 4b



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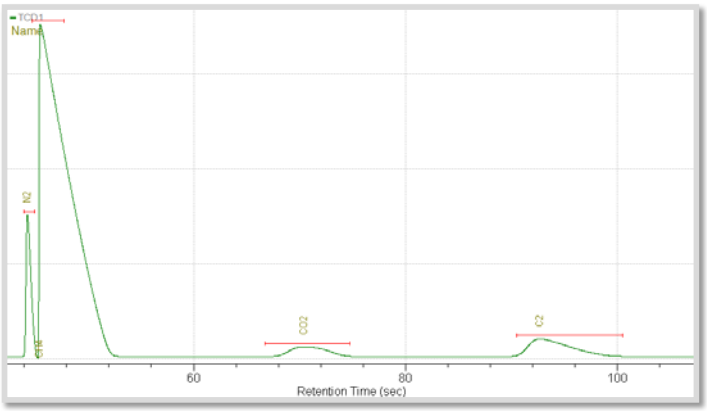
Analytical Module	**C13**
Software Version	3.10
Carrier Gas	Helium
Cycle Time	240s
Calculation Standard	Default setting ISO 6976

Calibration Gas	
Required Component	Recomended Concentration
Nitrogen	4,00
Carbon dioxide	1,50
Methane	88,95
Ethane	4,00
Propane	1,00
iso-Butane	0,20
n-Butane	0,20
neo-Pentane*[1]	
iso-Pentane	0,05
n-Pentane	0,05
Hexane and Higher*[2]	0,05

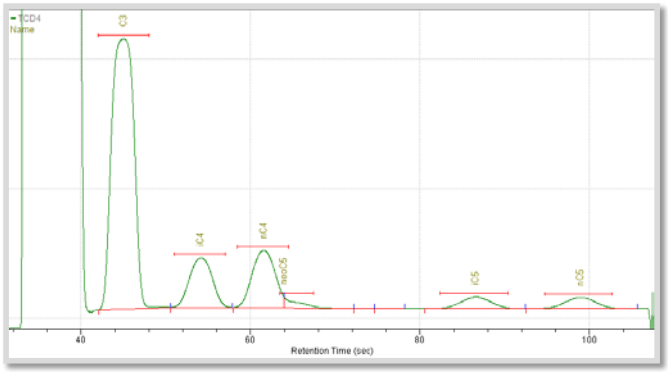
Measurement	
Component	Measuring range
Nitrogen	0-25
Carbon dioxide	0-20
Methane	50-100
Ethane	0-20
Propane	0-15
iso-Butane	0-10
n-Butane	0-10
neo-Pentane	0-1
iso-Pentane	0-1
n-Pentane	0-1
Group C6+	0-3

M*[1] - Neopentane is measured with relative response factor to Isopentane
M*[1] - for direct calibration of Neopentane see Manual - "4.2 Requirements for calibrating"
M*[2] - Group C6+ is calibrated using certified natural gas

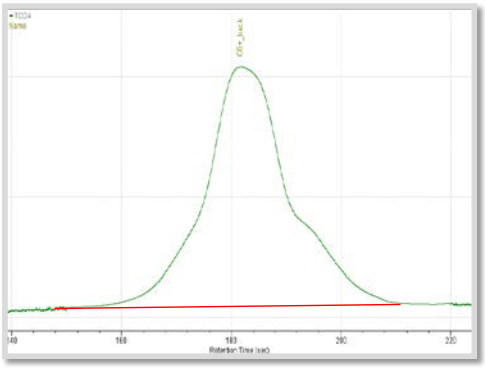
Signal observed at TCD 1



Signal observed at TCD 4b



Signal observed at TCD 4a - backflush



*** This Extended Application has to be ordered separately**

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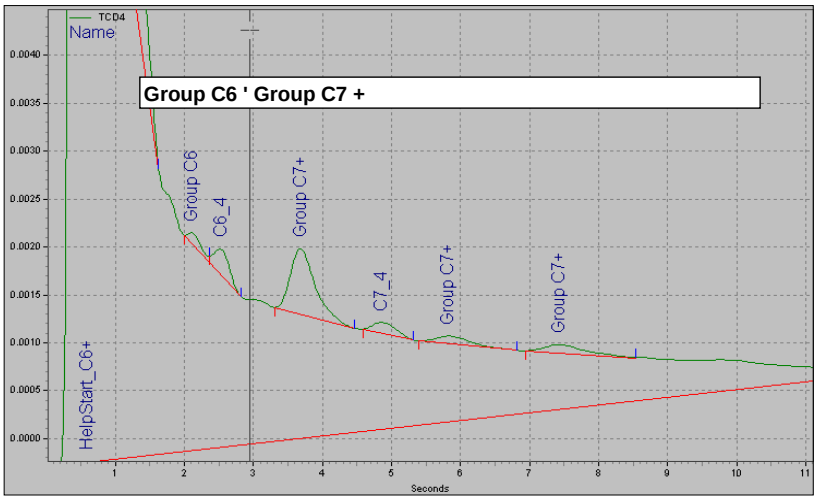
Application	**Enhanced C6+ analysis extended**	
Analytical Module	**C01**	C09
Software Version	3.10	
Carrier Gas	He	He
Cycle Time	150s	100s

Calibration Gas	
Required Component	Concentration
Nitrogen	4,00
Carbon dioxide	1,50
Methane	88,90
Ethane	4,00
Propane	1,00
iso-Butane	0,20
n-Butane	0,20
neo-Pentane	
iso-Pentane	0,05
n-Pentane	0,05
n-Hexane	0,05
n-Heptane	0,05

Measurement	
Component	Measuring range
Nitrogen	0-25
Carbon dioxide	0-20
Methane	50-100
Ethane	0-20
Propane	0-15
iso-Butane	0-10
n-Butane	0-10
neo-Pentane	0-1
iso-Pentane	0-1
n-Pentane	0-1
Group C6	0-1
Group C7+	0-3

Differences to default configuration
Operating device with different carrier gas to delivered solution causes damage of analytical module.
** Groups C6 and C7+ are measured separately
Group C6 is calibrated with n-Hexane
Group C7+ is calibrated with n-Heptane

Peaks and Groups at detector TCD 4a - difference to default solution



Loading a "country specific setup" or "extended application" causes a reconfiguration of the delivered system.

Before loading setup

carefully read SITRANS CV Control Software Manual
ensure that delivered configuration has not been changed
choose setup according to your measurement and calibration preferences

Choosing file:

ensure which carrier gas is your device predestined for
check type of the analytical module integrated in the base unit
check software version

The chromatograph signals an "Loading Error" if chosen setup file was not compatible.
Please reload factory made configuration from Parameter Backup CD

*** This Extended Application has to be ordered separately**

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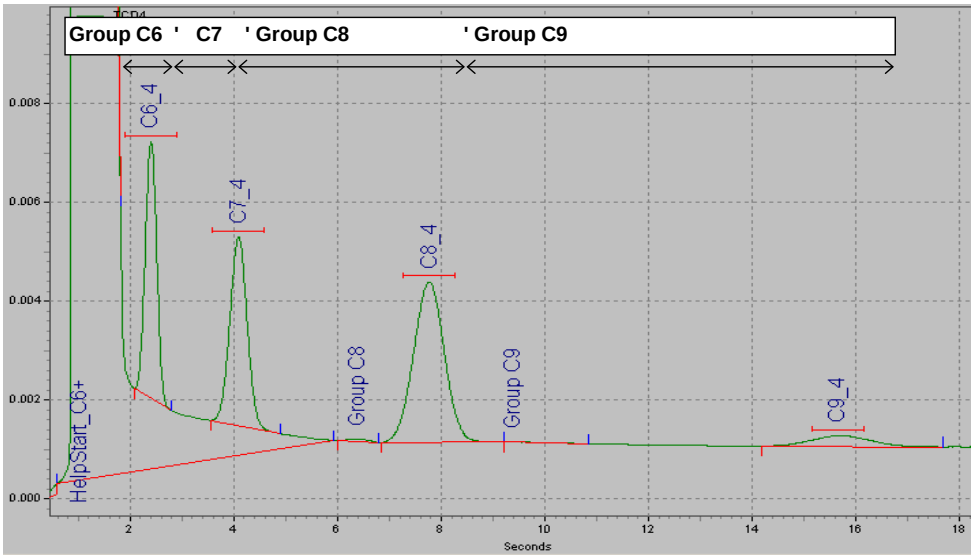
Application	**Enhanced C6+ analysis extended**	
Analytical Module	**C01**	C09
Software Version	3.10	
Carrier Gas	He	He
Cycle Time	150s	100s

Calibration Gas	
Required Component	Concentration
Nitrogen	4,00
Carbon dioxide	1,50
Methane	88,90
Ethane	4,00
Propane	1,00
iso-Butane	0,20
n-Butane	0,20
neo-Pentane	
iso-Pentane	0,05
n-Pentane	0,05
n-Hexane	0,05
n-Heptane	0,05
n-Octane	0,05
n-Nonane	0,05

Measurement	
Component	Measuring range
Nitrogen	0-25
Carbon dioxide	0-20
Methane	50-100
Ethane	0-20
Propane	0-15
iso-Butane	0-10
n-Butane	0-10
neo-Pentane	0-1
iso-Pentane	0-1
n-Pentane	0-1
Group C6	0-1
Group C7	0-1
Group C8	0-1
Group C9	0-1

Operating device with different carrier gas to delivered solution causes damage of analytical module.
Group C6, Group C7, Group C8, Group C9 are measured separately
groups are calibrated with n-Hexane, n-Heptane, n-Octane, n-Nonane

Peaks and Groups at detector TCD 4a - difference to default solution



Loading a "country specific setup" or "extended application" causes a reconfiguration of the delivered system.

Before loading setup

carefully read SITRANS CV Control Software Manual
ensure that delivered configuration has not been changed
choose setup according to your measurement and calibration preferences

Choosing file:

ensure which carrier gas is your device predestined for
check type of the analytical module integrated in the base unit
check software version

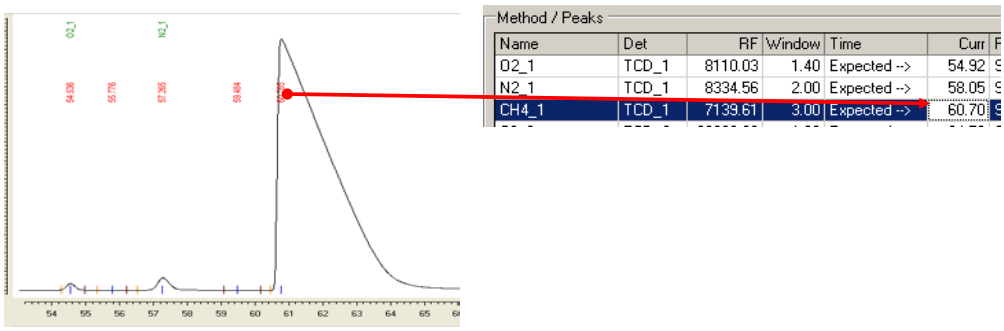
The chromatograph signals an "Loading Error" if chosen setup file was not compatible.
Please reload factory made configuration from Parameter Backup CD

Technical Support

The chromatograph signals an "Optimization Error" if not all peaks are detected which are referenced for the optimization

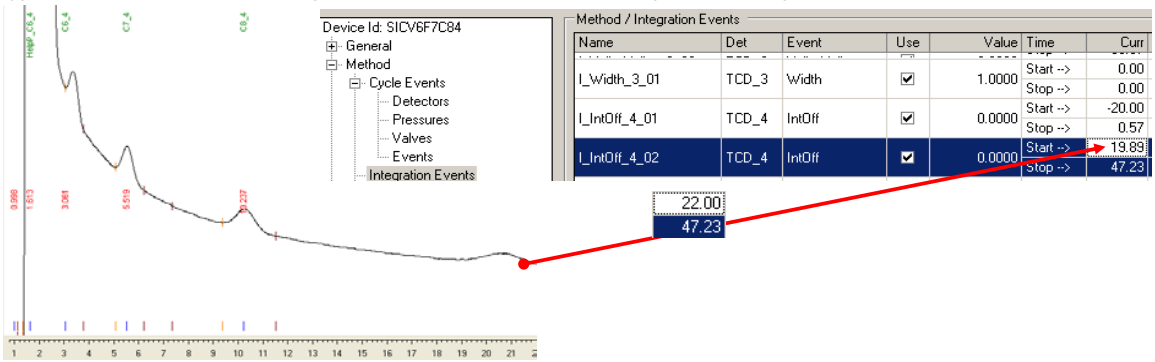
Adjusting peak position

You need to adjust manually peak position if peak name does not appear above retention time (red) on chromatogram
The name of the peak and retention time must appear on the chromatogram
Type manual correction of the retention time in window : CVControl/DeviceSetup/Method/Peaks/Time Curr



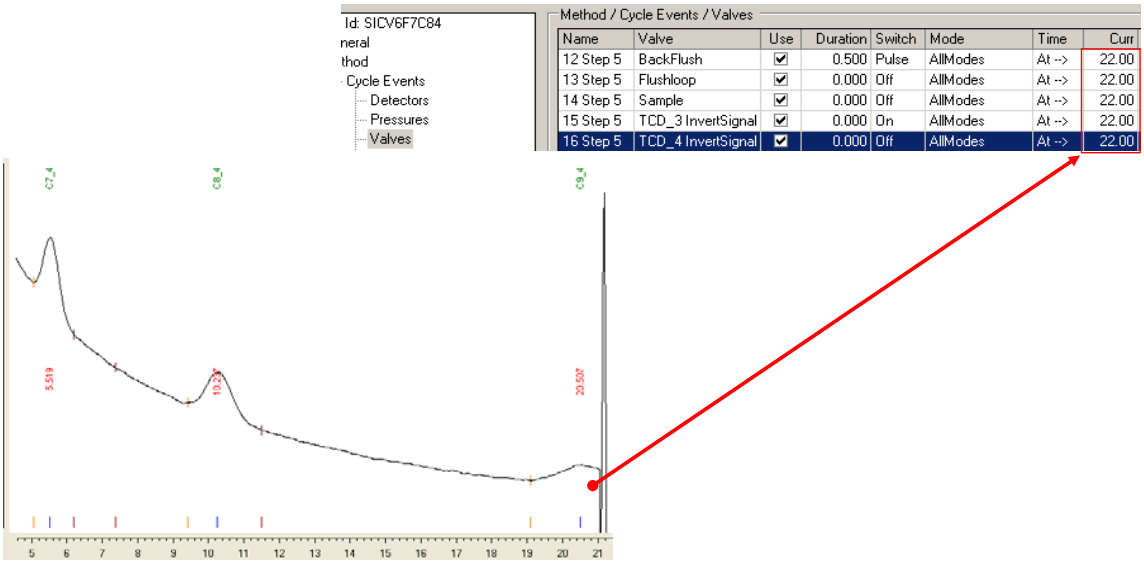
Adjusting Integration Event

You need to adjust manually integration event if either peak name nor retention time does not appear above peak
Example: Required peak at TCD4 is not recognized because integration is already off at this time window.
Type manual correction of the integration event : CVControl/DeviceSetup/Method/Integration Events



Adjusting switching time

You need to adjust manually valve event if peak detection is disturbed by switching of valves
Example: Required peak C9_4 at TCD4 is disturbed by switching at 21s
Type manual correction of the valve event : CVControl/DeviceSetup/Method/Integration Events
Example: there are several valve events collected together to Step 5 occurring at this time



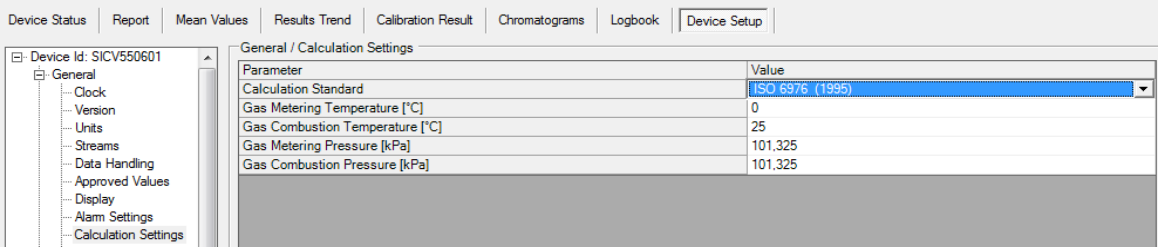
When all peaks referenced for optimization are recognized start again calibration process with active optimization.
During optimization chromatograph adjust automatic pecisely switching times peak positions and integration events
More about Optimization can be found in manual for CVControl

Technical Support

SITRANS CV automatically calculates calorific values in accordance with the following standards:

- **ISO 6976 (1995)**
- GOST 30319 (1996)
- AGA 8 (1994)

CVControl allows you to choose setting appropriate to your local regulations.



Note
AGA 8 also includes the standards GPA 2172 and ASTM 3588.
AGA 8 also includes ISO 12213 and API Chapter 14.2 for the Compression Factor .
The supplied product is set to ISO 6976.

Description of parameters
- Gas Metering Temperature

Is a reference variable for calculating the calorimetric values, and is described in the standard.
The range can be selected as 0, 15 or 20 °C.
- Gas Combustion Temperature

Is a reference variable for calculating the calorimetric values, and is described in the standard.
The range can be selected as 0, 15, 20 or 25 °C.