



cmc Instruments GmbH

Acceptance Certificate

S/N 43004

Argon Gaschromatograph

QE 43034

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Argon Product Analyzer K4000^{ng} /S/N 43104) - Tag no. QE 43034

Manufacturer: Controle Analytique, Canada
Supplier: cmc Instruments GmbH, Hauptstrasse 388, -65760 Eschborn

Type: Process Chromatograph
Design: Rack mounted system (19")
 Including data acquisition and configuration software
 Windows XP Embedded, Language English

Sample gas preparation: External
Measurement value processing: Dry contacts for alarms, maintenance etc.
 4 ... 20 mA Output Signal for each Measuring Range
 Ethernet interface Internet communication ready and network communication ready

Electrical Connection: 230 V; 50 Hz
Sample gas: Argon 5.0, Vapour, Pressure 1,5 bar a
Measuring Ranges:

H2	0... 10 ppm, LDL < 1 ppm
N2	0... 10 ppm, LDL < 1 ppm
CH4	0... 2 ppm, LDL < 0,1 ppm
CO2	0... 5 ppm, LDL < 0,1 ppm
CO	0... 2 ppm, LDL < 0,1 ppm
CnHm	0... 2 ppm, LDL < 0,1 ppm

Detector: Plasma Emission Detector
Oxygen trap: Yes
Carrier gas type: Argon 6.0, cleaned by purifier GP-200 (Controle Analytique), rest impurities < 10 ppb (as specified in tech. data of purifier)

Carrier gas cylinder pressure: 100 psig (with gas purifier installed)
Carrier gas 1: 30 cc/min
Carrier gas 2: 35 cc/min
Carrier gas 3: 30 cc/min
Carrier gas 4: 30 cc/min
Supporting gas (O2 pressure) 3 psi

Sample flow master: 50 cc/min.
Sample flow slave 50 cc/min.
Sample inlet pressure: min. 10 psi
Total carrier flow consumption: 90 cc/min.
Total sample flow consumption: 150 cc/min.

Tests:

Calibration test:	passed with span gas (see attached certificate)
Sample measurement test:	passed , at sample point QE 43034
mA-output test:	passed (mA-outputs calibrated)
Status alarm test:	passed (open when active)
Purifier test:	passed

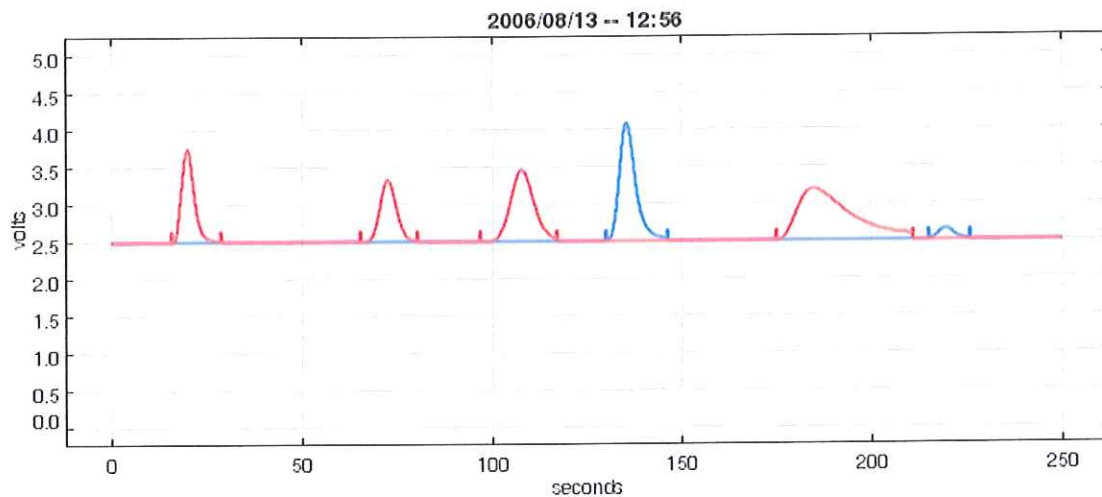
Additional settings:

- (1) Impurity no. 6 CnHm is additional in fact of new measurement technology. A 4-20 mA analogue output signal is installed.
- (2) Range identification for each impurity is removed in fact of 1 range analyzer

0	13.08.2006	Schröder							
Rev.	Date	Name	check.	changes	Rev.	Date	Name	check.	changes

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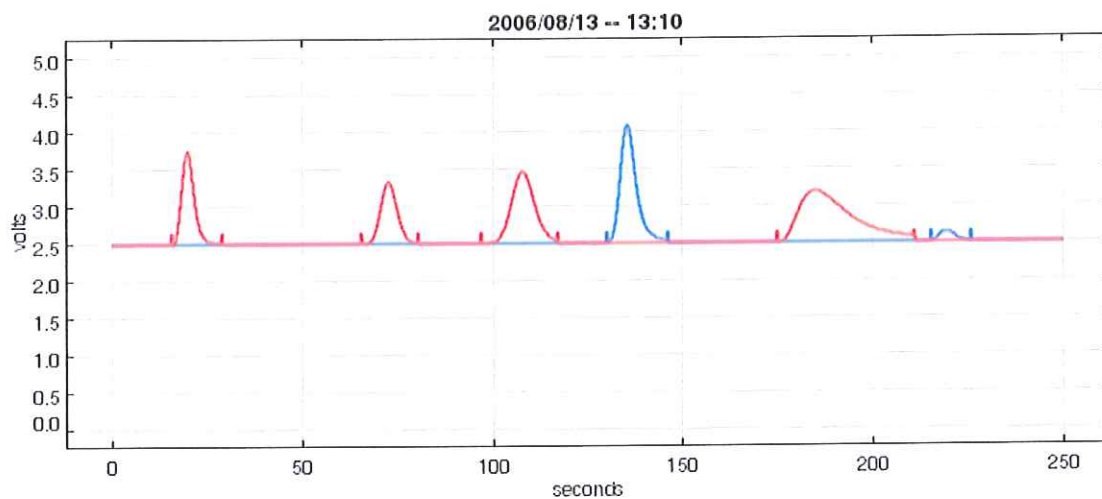
Argon Product



Peak #	Name	Impurity (PPM)	Area	Retention time (sec)
0	H2	7.67	50502256	63
1	N2	7.95	44068624	232
2	CH4	1.78	72344112	345
3	CO2	4.09	82087760	433
4	CO	1.68	100444240	591
5	NmHC	0.16	6565089	703

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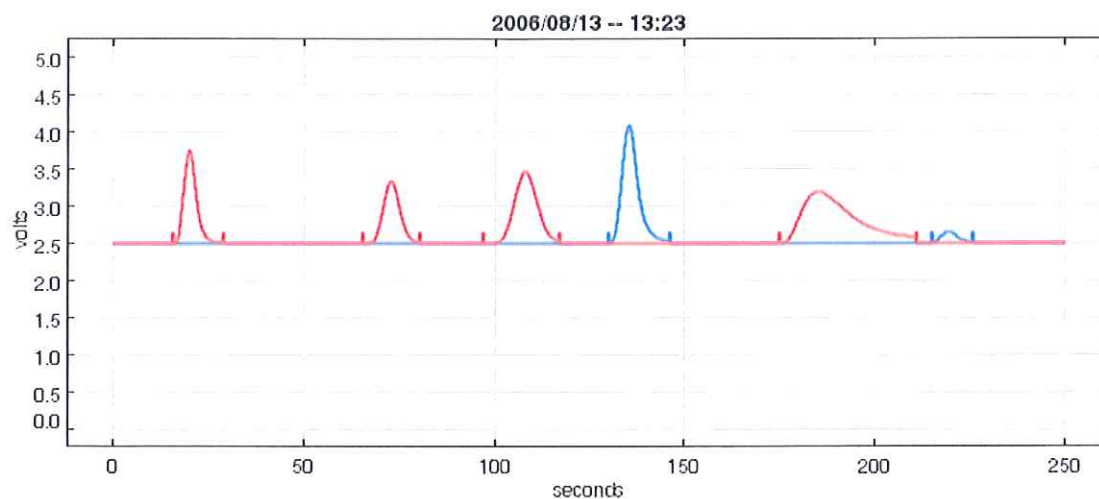
Argon Product



Peak #	Name	Impurity (PPM)	Area	Retention time (sec)
0	H2	7.7	50730524	63
1	N2	7.91	43882608	232
2	CH4	1.75	71260528	345
3	CO2	4.12	82528720	433
4	CO	1.68	100186176	593
5	NmHC	0.16	6754545	703

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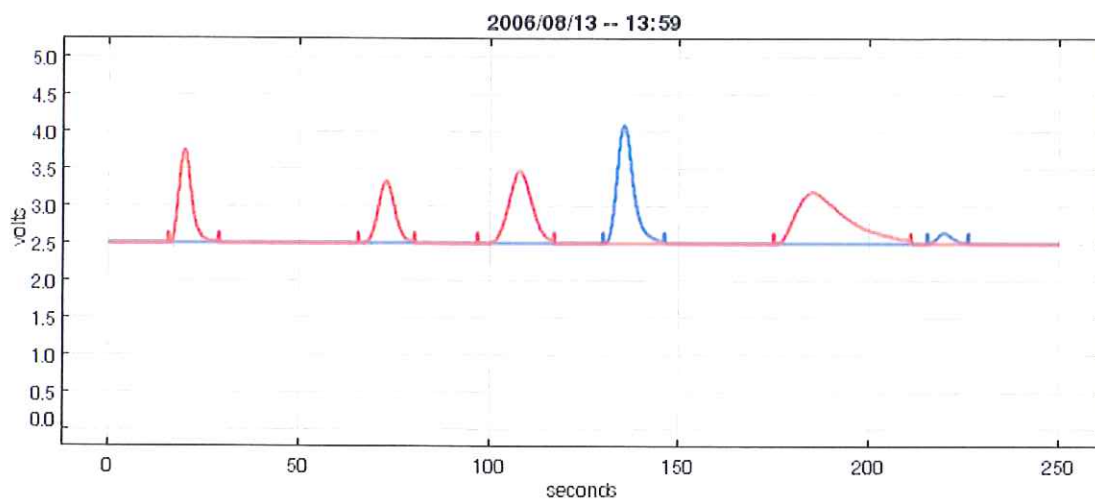
Argon Product



Peak #	Name	Impurity (PPM)	Area	Retention time (sec)
0	H2	7.72	50837000	63
1	N2	7.95	44062956	233
2	CH4	1.76	71638208	345
3	CO2	4.13	82786928	433
4	CO	1.68	100060952	593
5	NmHC	0.17	7174164	701

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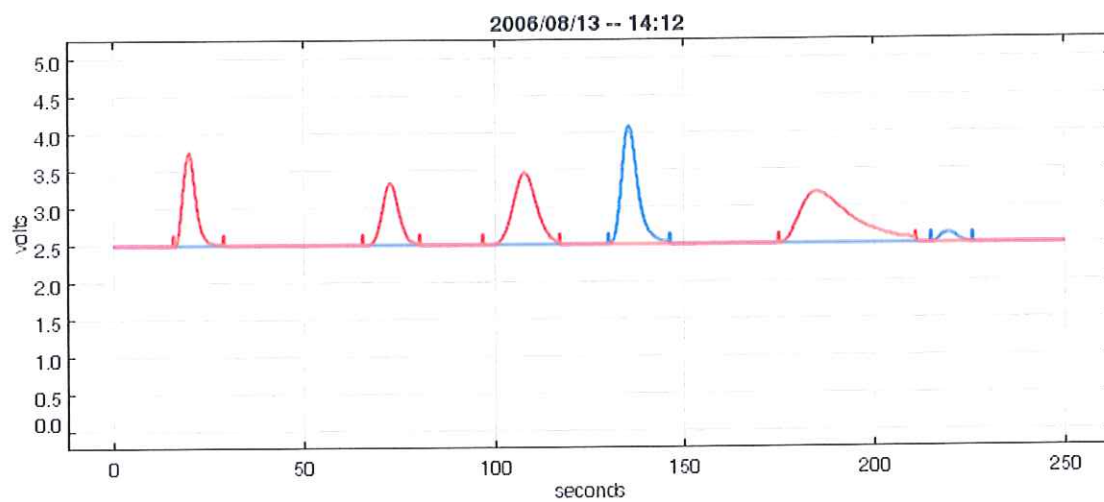
Argon Product



Peak #	Name	Impurity (PPM)	Area	Retention time (sec)
0	H2	7.79	51265668	63
1	N2	7.96	44154304	232
2	CH4	1.76	71573688	345
3	CO2	4.13	82762352	433
4	CO	1.55	92619752	592
5	NmHC	0.17	6930650	702

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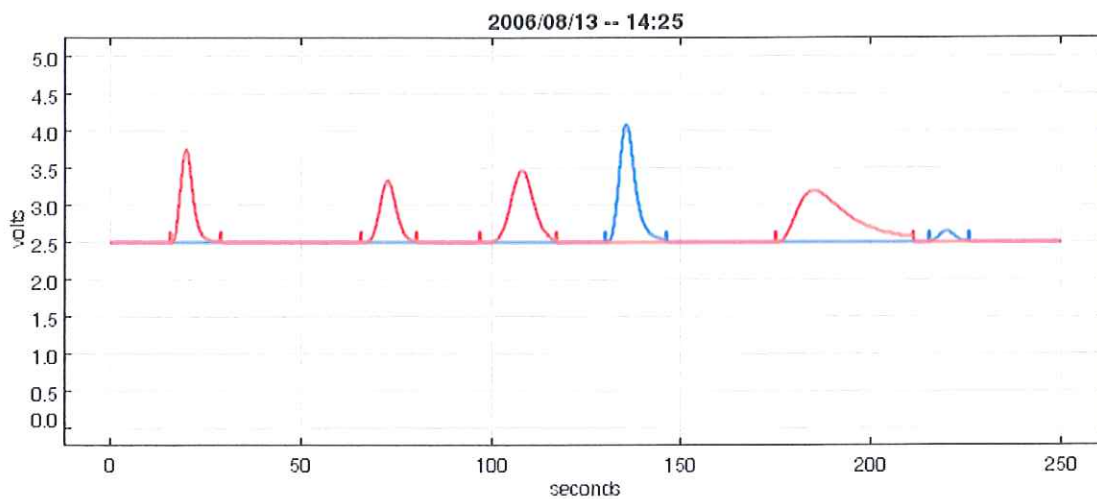
Argon Product



Peak #	Name	Impurity (PPM)	Area	Retention time (sec)
0	H2	7.71	50754600	63
1	N2	7.87	43610808	232
2	CH4	1.76	71656288	345
3	CO2	4.13	82803024	433
4	CO	1.72	103000664	592
5	NmHC	0.15	6315658	703

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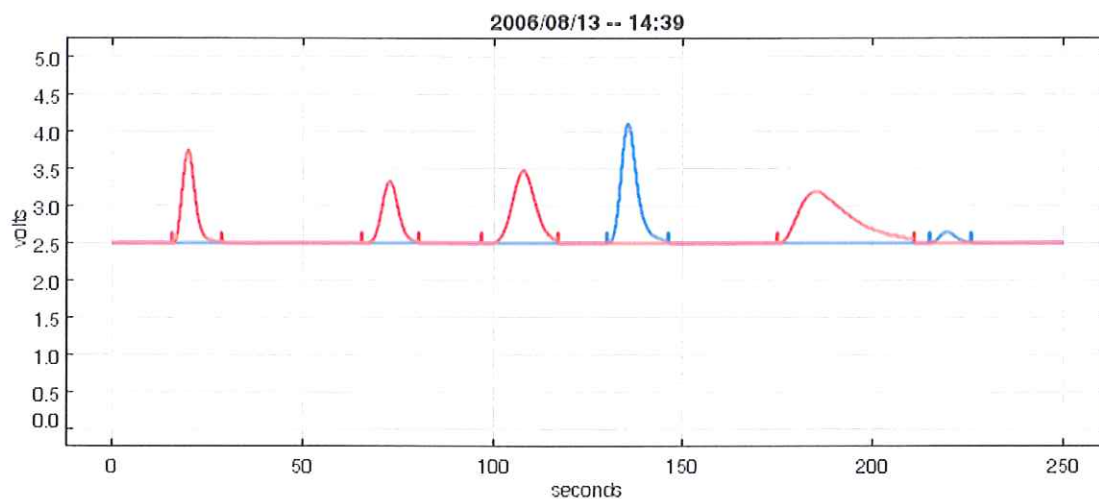
Argon Product



Peak #	Name	Impurity (PPM)	Area	Retention time (sec)
0	H2	7.78	51250332	63
1	N2	7.95	44065572	232
2	CH4	1.78	72326616	345
3	CO2	4.14	83087608	433
4	CO	1.74	103664720	592
5	NmHC	0.17	6896874	703

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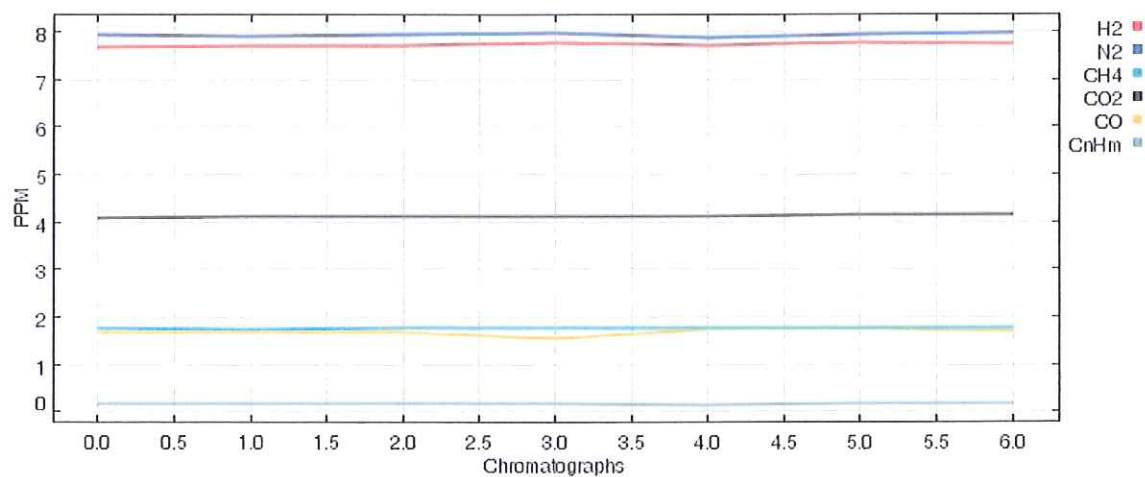
Argon Product



Peak #	Name	Impurity (PPM)	Area	Retention time (sec)
0	H2	7.75	51046180	63
1	N2	7.96	44136304	232
2	CH4	1.77	71868768	345
3	CO2	4.16	83443120	433
4	CO	1.69	100798128	593
5	NmHC	0.16	6501962	703

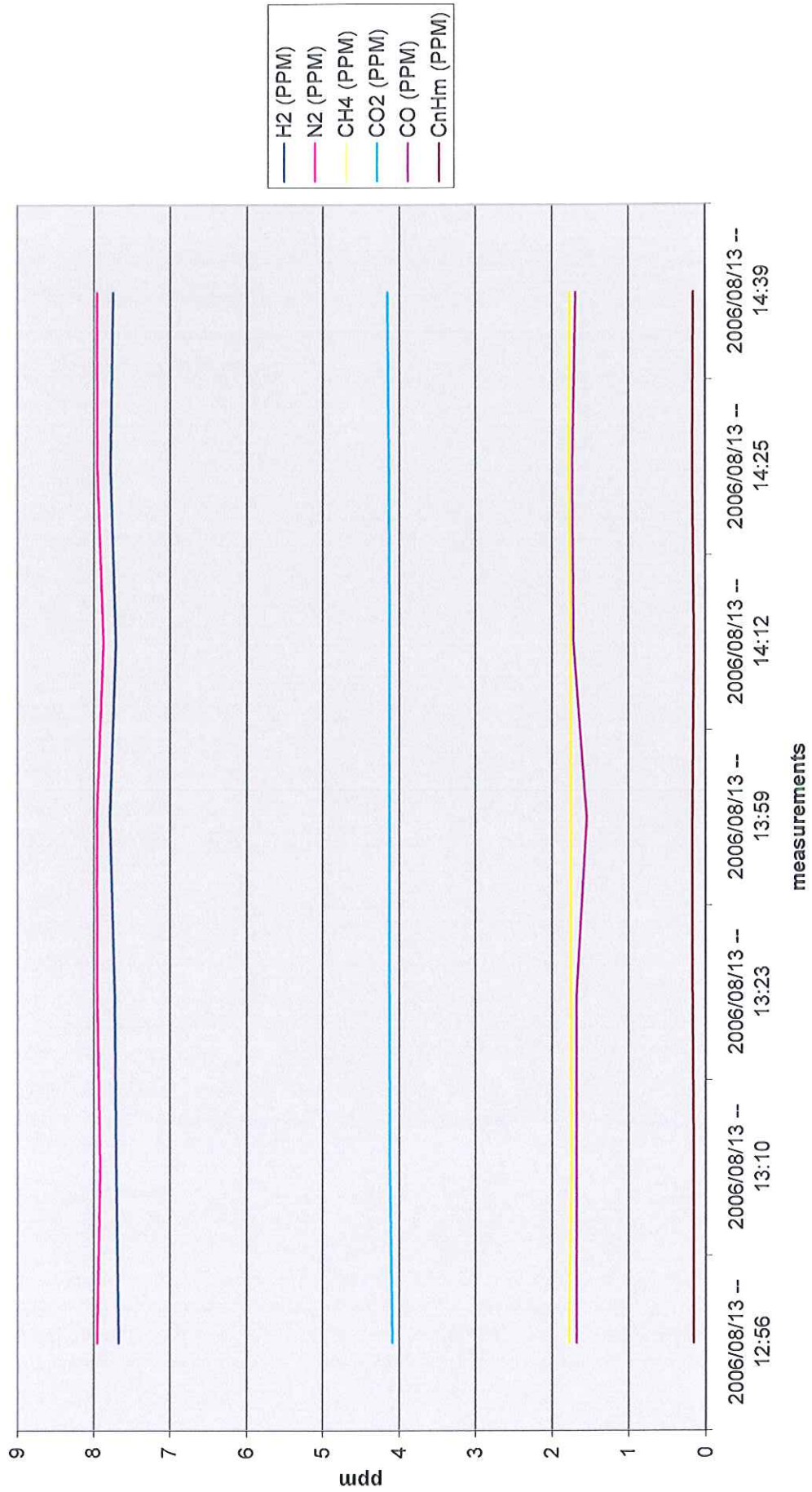
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Peak	Mean (PPM)	Min (PPM)	Max (PPM)	Median (PPM)
H2	7.73	7.67	7.79	7.72
N2	7.94	7.87	7.96	7.95
CH4	1.77	1.75	1.78	1.76
CO2	4.13	4.09	4.16	4.13
CO	1.68	1.55	1.74	1.68
CnHm	0.16	0.15	0.17	0.16

K4000 Argon product QE 43034



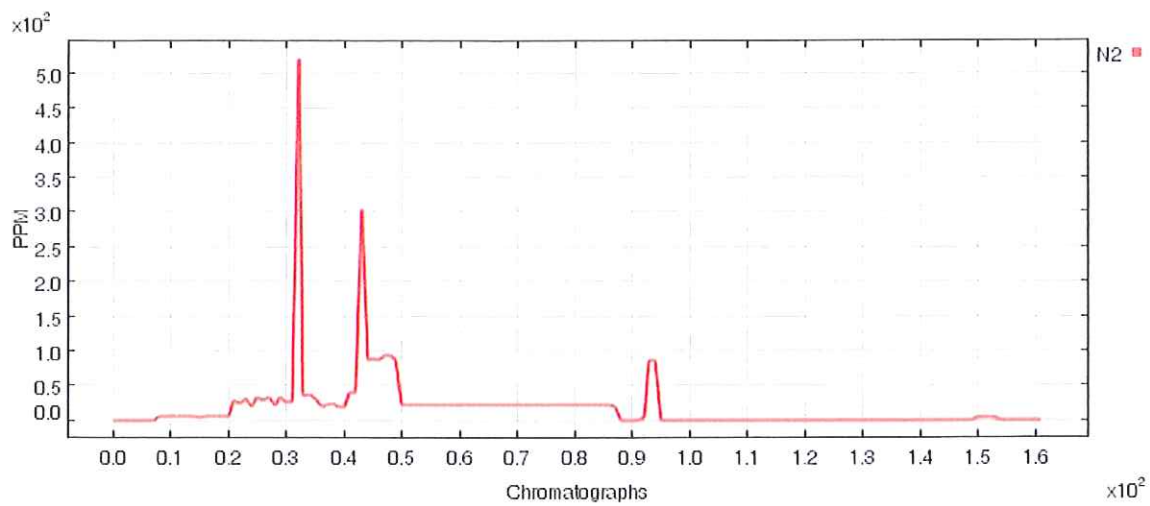


History
Table

Date	H2 (PPM)	N2 (PPM)	CH4 (PPM)	CO2 (PPM)	CO (PPM)	CnHm (PPM)
2006/08/13 -- 12:56	7,67	7,95	1,78	4,09	1,68	0,16
2006/08/13 -- 13:10	7,7	7,91	1,75	4,12	1,68	0,16
2006/08/13 -- 13:23	7,72	7,95	1,76	4,13	1,68	0,17
2006/08/13 -- 13:59	7,79	7,96	1,76	4,13	1,55	0,17
2006/08/13 -- 14:12	7,71	7,87	1,76	4,13	1,72	0,15
2006/08/13 -- 14:25	7,78	7,95	1,78	4,14	1,74	0,17
2006/08/13 -- 14:39	7,75	7,96	1,77	4,16	1,69	0,16

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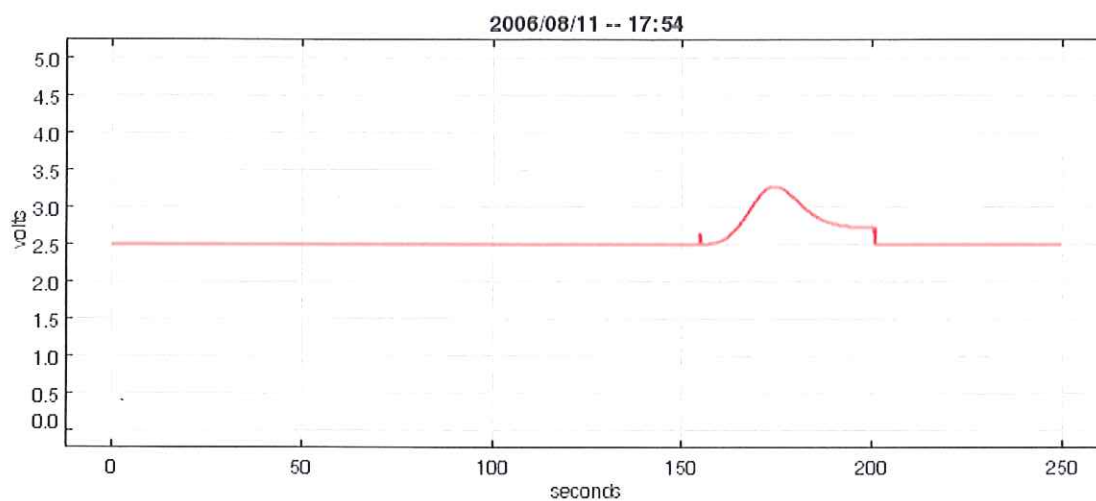
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Peak	Mean (PPM)	Min (PPM)	Max (PPM)	Median (PPM)
N2	19.05	0.0	519.19	5.39

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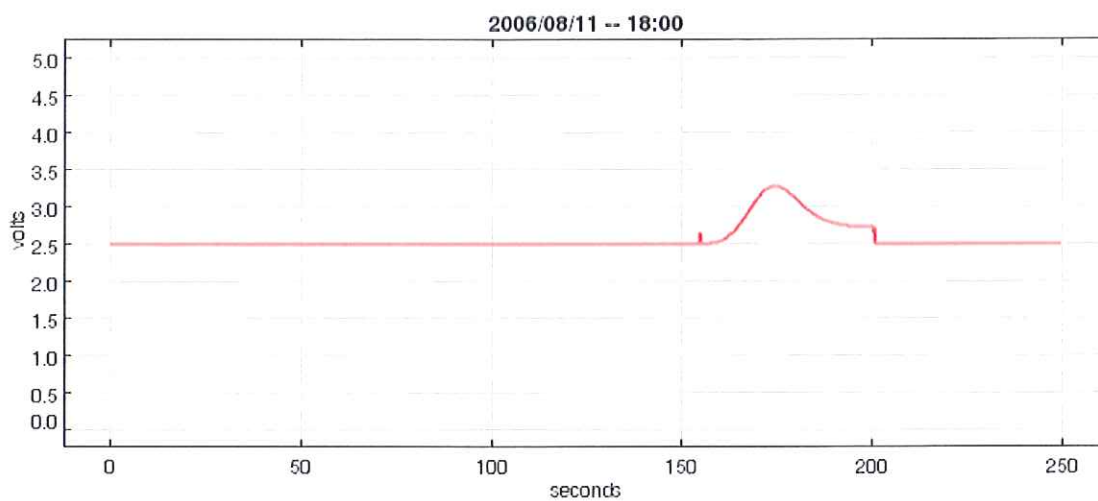
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Peak #	Name	Impurity (PPM)	Area	Retention time (sec)
0	N2	87.19	46193864	209

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Argon Product



Peak #	Name	Impurity (PPM)	Area	Retention time (sec)
0	N2	86.3	45832308	210

Contrôle Analytique K4000 Trace Gas Analyzer

SYSTEM CONFIGURATION

	DATE:	July 28, 2006
	S/N:	43104
Model:	K4000NG-220	
Analysis Type:	Trace H2-N2-CH4-CO-CO2-NmHC IN ARGON	
Range set:	Range #1: H2-N2 0-10ppm/CO2 0-5 ppm/CH4-CO-THC 0-2 ppm	
	Range #2: H2-N2 0-10ppm/CO2 0-5 ppm/CO-THC 0-2 ppm	
Chromatographic Column:	Col #1: 10' washed molecular sieve 60/80, frit on both ends	
	Col #2: 4' washed molecular sieve 60/80, frit on both ends	
	Col #3: 12' poropak Q 80/100, frit on both ends	
	Col #4: 4' Hayesep D 100/120, frit on both ends	
Moisture Trap:	N/A	
Chemical Trap:	N/A	
Gas conditioning Module (GCM):	Installed on carrier 1, 2, 3 and 4	
Valves:	V1: Injection: 1 x 6 port G.C. Valve Valco	
	V2: Injection: 1 x 6 port G.C. Valve Valco	
	V3: Injection: 1 x 6 port G.C. Valve Valco	
	V4: backflush: 1 x 10 port G.C. Valve Valco	
Sample Volume:	S.L.1: 48" x 0.085" = 4,5cc(ml)	
	S.L.2: 48" x 0.085" = 4,5cc(ml)	
	S.L.3: 48" x 0.085" = 4,5cc(ml)	
	S.L.4: 48" x 0.085" = 4,5cc(ml)	
Carrier Gas Type:	Argon	
Carrier Gas Cylinder Pressure : (with a gas purifier installed)	100 psig	
Carrier 1 Flow:	30 cc/min	(PR1)
Carrier 2 Flow:	35 cc/min	(PR2)
Carrier 3 Flow:	30 cc/min	(PR3)
Carrier 4 Flow:	30 cc/min	(EPR6)
Supporting gas (O2 pressure) :	3 psi	(EPR3)
Sample Master Flow:	50 cc/min	(EPR1)
Sample Slave Flow:	50 cc/min	(EPR4)
Sample Pressure at the Sample Inlet:	10psig	
Total Carrier Flow Consumption:	90cc/min	
Total sample Flow Consumption:	150cc/min	

Contrôle Analytique K4000 Trace Gas Analyzer

OPERATING PARAMETERS

DATE: july 28,2006

S/N: 43104

PEAK DATA

Peak Number	Name	AVR	Starting	Ending	Gain	Pol.	DET#	P.Pwr	Range2 Scale	Range1 fact	PRE AMP
1	H2	1	44,0	95,0	10	inv	2	65	10	1x	1
2	N2	1	186,0	240,0	5	fol	1	65	10	1x	1
3	CH4	1	280,0	350,0	25	inv	2	65	2	1x	1
4	CO2	1	416,0	467,0	50	fol	7	65	5	1x	2
5	CO	1	493,0	596,0	60	fol	4	65	2	1x	2
6	THC	1	672,0	713,0	20	inv	9	65	2	1x	1

VALVE TIMING

ON (sec)	OFF (sec)
0	30
370	400
229	259
617	647

V1

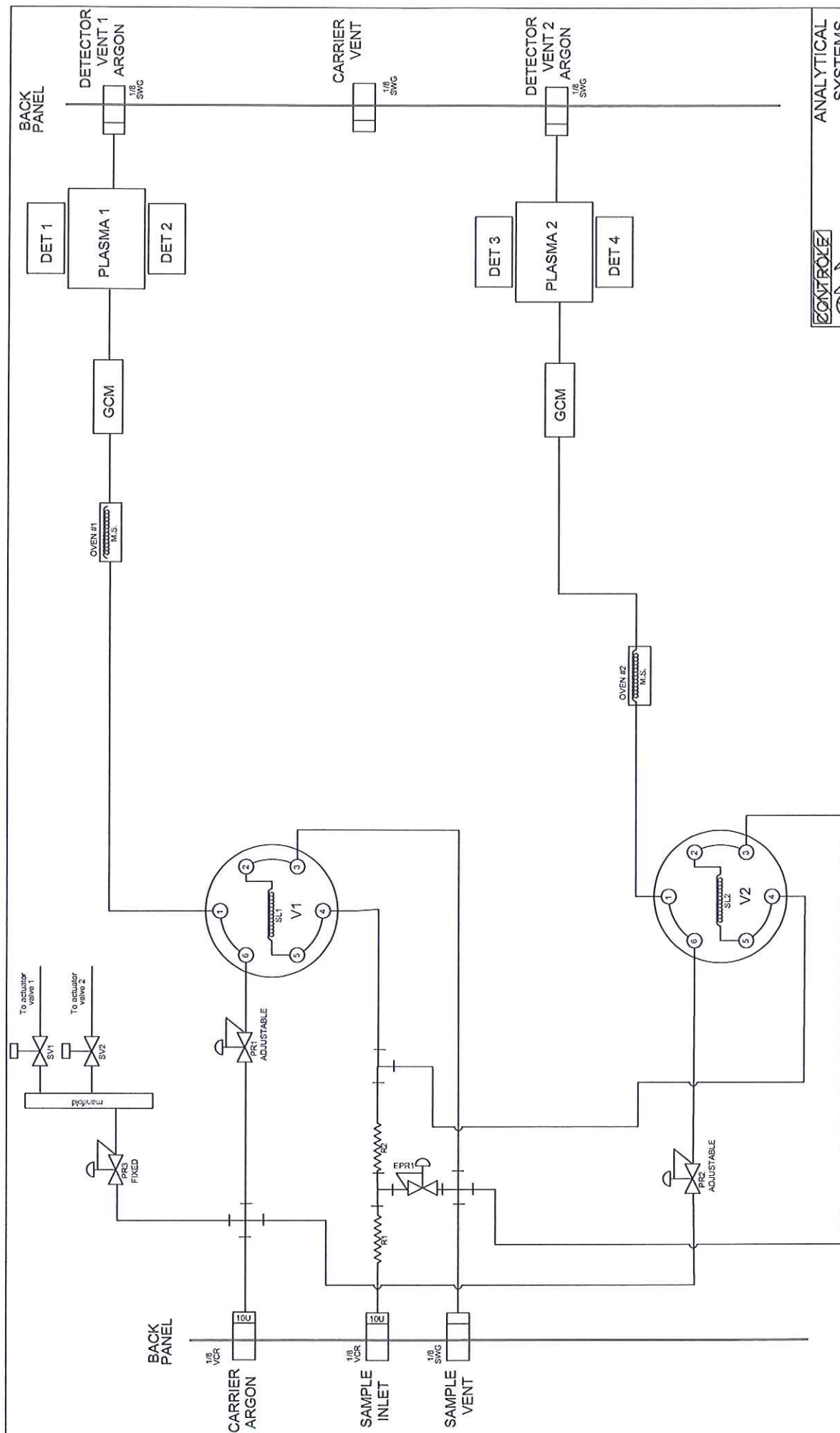
V2

V3

V4

OTHER PARAMETERS

Oven 1 temperature setpoint	50 °C
Oven 2 temperature setpoint	60 °C
Oven 3 temperature setpoint	50 °C
Oven 4 temperature setpoint	90 °C
Carrier gas type	Argon
Cycle Time	800 sec

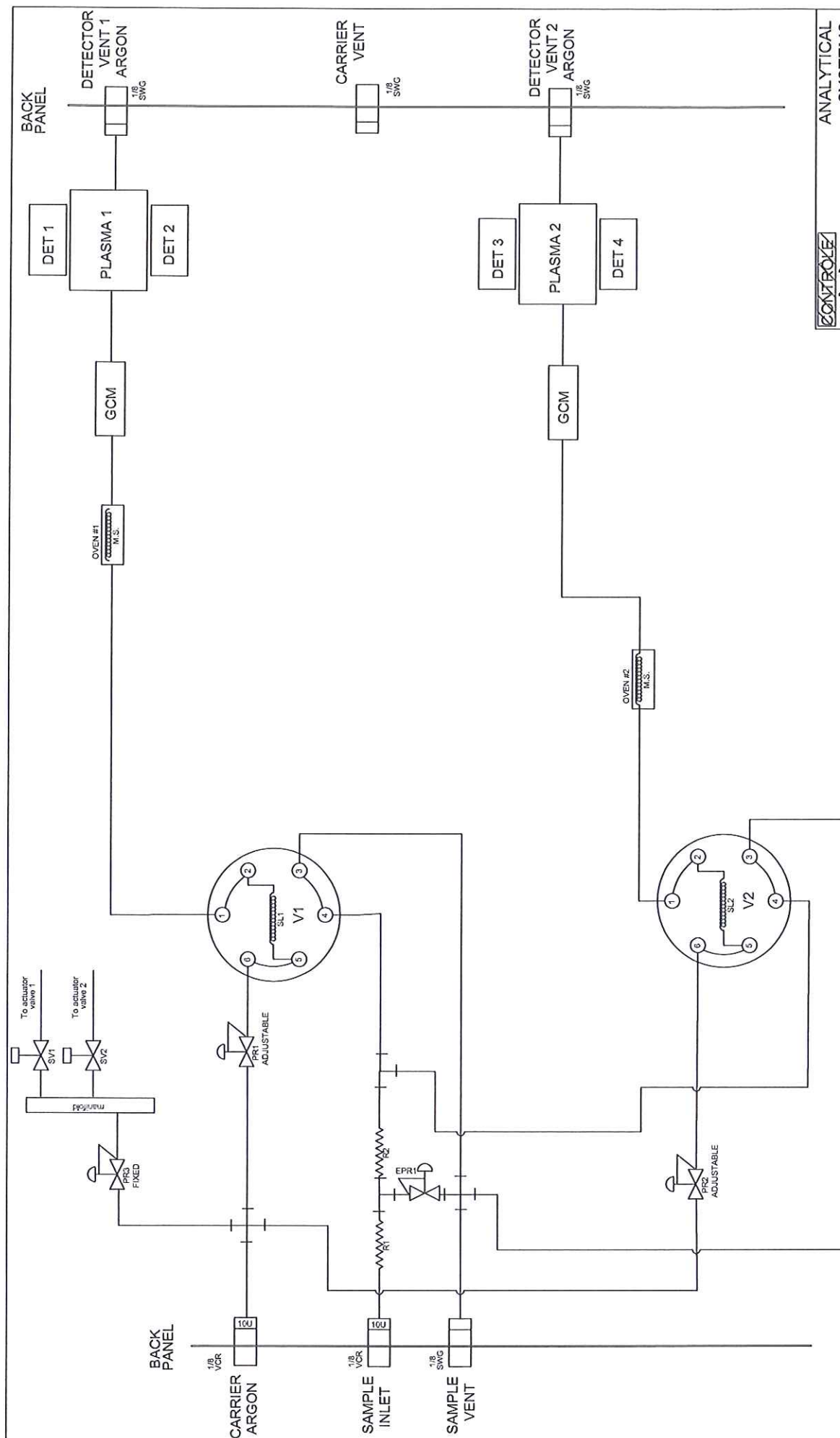


PLUMBING CONFIGURATION POSITION OFF FOR MASTER CHASSIS FOR SN
43104

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SYSTEMS
MANUFACTURER



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E-Mail: cal@info.net Web SITE:
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PLUMBING CONFIGURATION POSITION ON FOR MASTER CHASSIS FOR SN 43104

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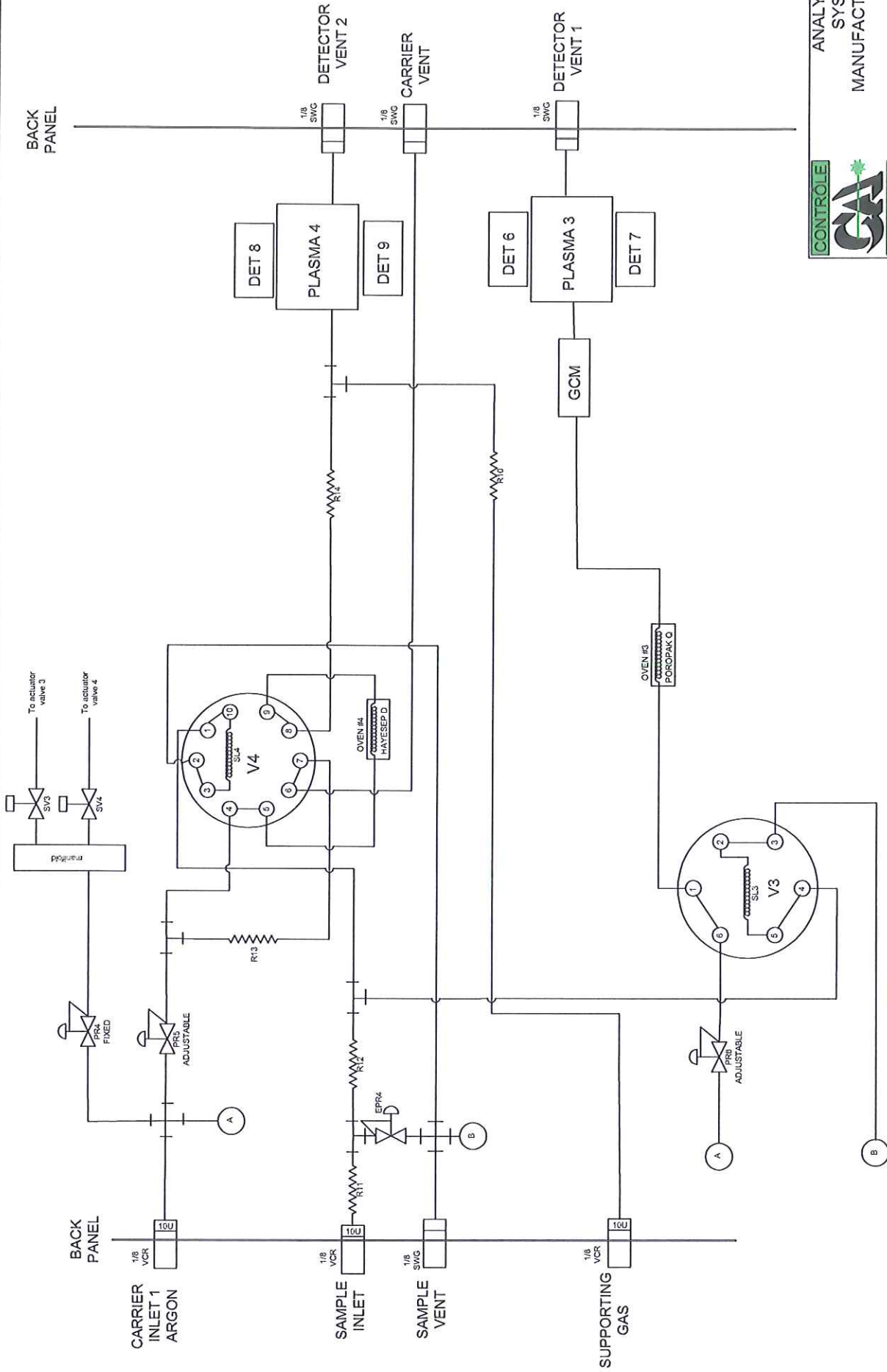
1076, JOHNSON EST. SUITE 101
THETFORD MINES (QUEBEC) CANADA
G8G 5W6
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PLUMBING CONFIGURATION POSITION OFF FOR SLAVE CHASSIS
K4000NG FOR AIR LIQUIDE



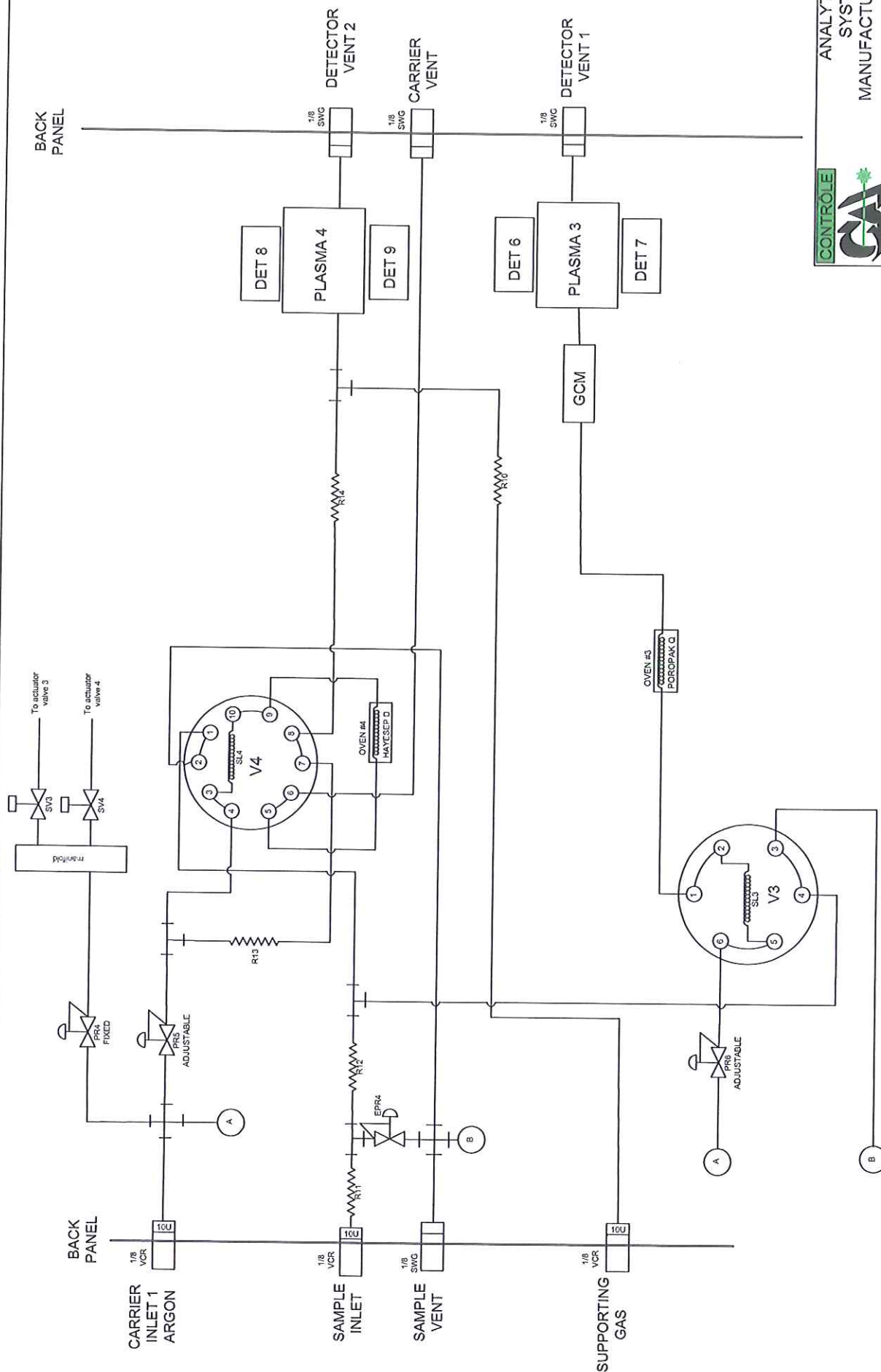
ANALYTICAL SYSTEMS MANUFACTURER



1076, JOHNSON EST. SUITE 101
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G6G 5W6

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PLUMBING CONFIGURATION POSITION ON FOR SLAVE CHASSIS K4000NG FOR AIR LIQUIDE





cmc Instruments GmbH

Acceptance Certificate

Argon Gaschromatograph

QE43034

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Notes:

- (1) Training for Supervisor Electric and Control (Mr. Martens)
- (2) Appendix with Chromatograms and tables as well as the Parameter and Configuration sheet of the analyzer is constituent of this certificate.

Ralph Schröder
cmc Instruments GmbH

Wolfgang Martens
Supervisor Electric and Control
Consultant Air Liquide Deutschland GmbH

Gildas Bonnier
Commissioning Manager
Air Liquide AG

0	13.08.2006	Schröder							
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