NEW LEVEL OF PERFORMANCE FOR HYDROCARBON ANALYSIS

KA CONFIG 4— LIGHT HYDROCARBONS ANALYSIS IN OXYGEN/AIR

SOLUTION FEATURES

- **Performance** :
  - Down to < 15 ppb LOD based on Epd* technology (< 5 ppb with eLOD)
  - Linearity: < 1%
- **Robustness**
  - **µInProve*** GC valve
  - **GCSense*** GC platform
  - High sensitivity eFID sensor
- **Optional automated multi-stream analysis**
  - Analyse multiple streams sequentially
  - High sample integrity with S^4 sample stream selection system
- **Full data analysis and reporting software**

KEY SPECIFICATIONS

- Impurities: C_1 to C_4
- Matrix: Oxygen or Air
- LDL: < 50 ppb

TYPICAL APPLICATIONS

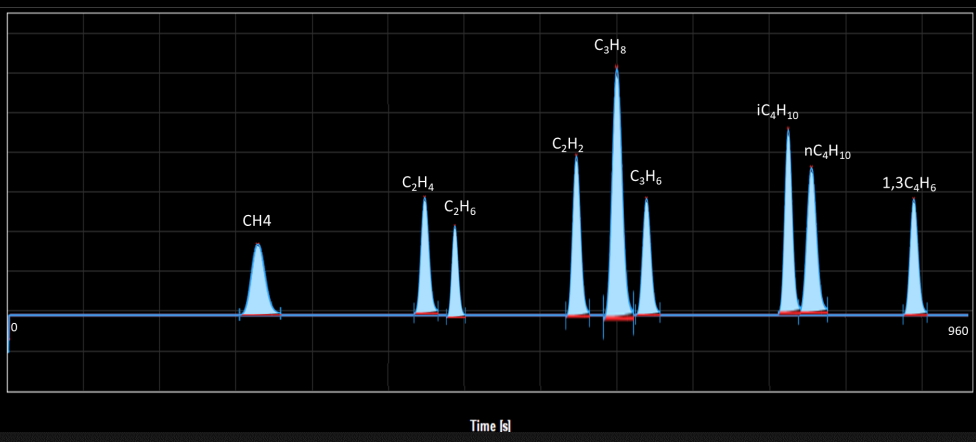
- Air Separation Planats
- Filling station
- Quality control
- R&D

Robustness, performance and affordability are important in the field of Air Separation. This analytical solution, for hydrocarbons analysis, has been built with that in mind based on our 30 years of experience.

The unsurpassed performance is possible due to high quality components from ASDevives. The eFID offers high sensitivity. The uInProve GC valve offers low maintenance and piece of mind. Finally, our industrial GC platform offers reliability and advanced features such as IIot capability for the new era.

*Patent pending

CHROMATOGRAM EXAMPLE: LIGHT HYDROCABONS IN O_2



APPLICATION PERFORMANCE HIGHLIGHTS

In the field of chromatography, most GC integrators use LOD to define the sensitivity of the GC system. The LOD is typically calculated using 3 times the signal to noise (SNR) using a peak of relatively high intensity. This is a good starting point to compare detector performance but it ignores many factors associated with the chromatographic method itself.

We have over 30 years of experience in the measurement of ultra-trace analytes. We know very well that just using a LOD calculation to measure the performance is not robust. At trace level, you may lose the impurities inside the column. So the real limit of detection can be higher. Also, baseline shape as well as matrix interference, which causes drift, dramatically impact the performance.

For that reason, we use both LOD and MDL. The MDL is the **method detection limit**. Instead of purely looking at the signal intensity vs the detector noise, this method involves injecting consecutively a sample with a known precise concentration close to the expected limit of detection. As a rule of thumb, this test is typically done 3 times above the expected limit of detection. This test is more robust when compare to standard LOD, because it takes into account all factors.

Here, we are providing both, the LOD and MDL. The tests were done using our iGCS dilution system. So always be careful when looking at LOD. Not everybody use the same definition.

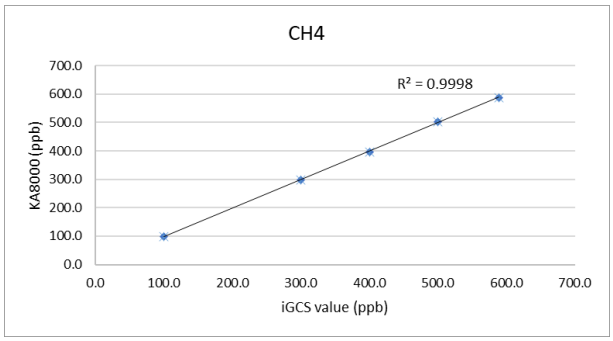
LIMIT OF DETECTION (LOD) AND METHOD LIMIT OF DETECTION (MDL)

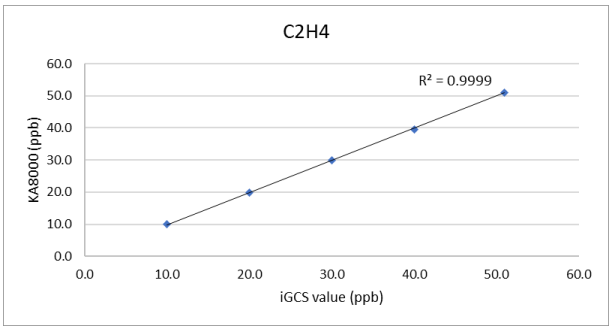
	Analysis #	CH4	C2H4	C2H8	C2H2	C3H8	C3H6	iC4H10	nC4H10	1,3C4H6
	1	4.92	4.93	4.99	4.94	4.92	4.93	4.94	4.97	4.94
	2	4.87	5.03	4.93	4.94	4.93	4.90	4.91	4.90	4.86
	3	4.89	4.91	4.93	4.96	4.94	4.87	4.95	5.00	4.87
	4	4.88	4.86	4.84	4.95	4.92	4.90	4.93	4.94	4.85
	5	4.90	4.81	5.06	4.99	4.90	4.94	4.93	4.93	5.02
	6	4.89	4.92	4.87	5.01	4.94	4.90	4.92	4.98	4.90
	7	4.85	4.96	4.93	4.90	4.91	4.91	4.95	4.98	4.94
	8	4.87	4.88	4.88	4.93	4.92	4.92	4.95	4.90	4.87
	9	4.86	4.93	4.88	4.97	4.90	4.92	4.97	4.89	4.94
	10	4.80	4.91	4.87	4.95	4.92	4.89	4.93	4.91	4.95
Without eLOD	σ	0.03	0.06	0.07	0.03	0.01	0.02	0.02	0.04	0.05
	MDL	0.10	0.18	0.20	0.09	0.04	0.06	0.05	0.12	0.16
	LOD	0.09	0.08	0.10	0.04	0.03	0.03	0.03	0.04	0.05
With eLOD	σ	0.01	0.02	0.02	0.01	0.00	0.01	0.01	0.01	0.02
	MDL	0.03	0.06	0.07	0.03	0.01	0.02	0.02	0.04	0.05
	LOD	0.03	0.03	0.03	0.01	0.01	0.01	0.01	0.01	0.02

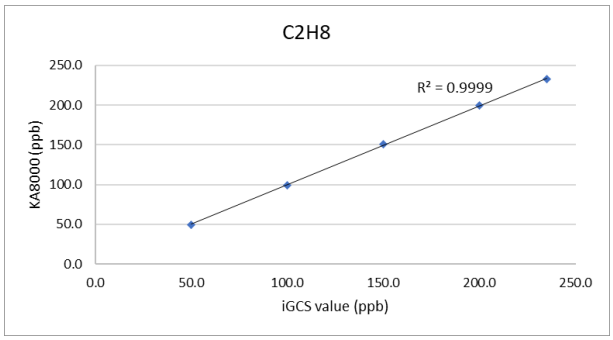
LINEARITY DATA

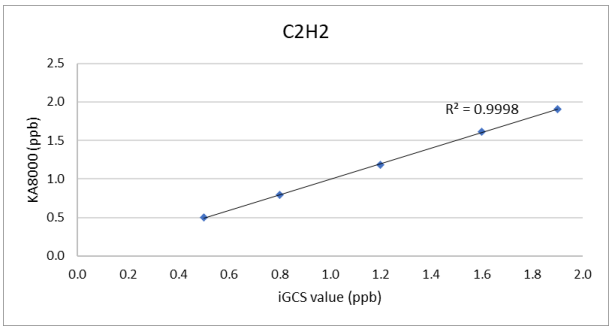
CH4		C2H4		C2H6		C2H2		C3H8		C3H6		iC4H10		nC4H10		1,3C4H6	
Ref	Reading	Ref	Reading	Ref	Reading	Ref	Reading	Ref	Reading	Ref	Reading	Ref	Reading	Ref	Reading	Ref	Reading
0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.0	99.1	10.0	9.9	50.0	49.8	0.5	0.5	5.0	5.0	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
300.0	297.7	20.0	19.8	100.0	99.4	0.8	0.8	12.0	12.0	0.80	0.80	0.80	0.80	0.80	0.81	0.80	0.79
400.0	396.9	30.0	29.9	150.0	150.4	1.2	1.2	15.0	15.0	1.20	1.20	1.20	1.19	1.20	1.21	1.20	1.21
500.0	503.5	40.0	39.6	200.0	199.5	1.6	1.6	17.0	16.9	1.60	1.59	1.60	1.61	1.60	1.61	1.60	1.60
589.0	588.2	51.0	51.1	235.0	233.0	1.9	1.9	19.0	19.0	1.90	1.91	1.90	1.91	2.10	2.11	2.00	2.01

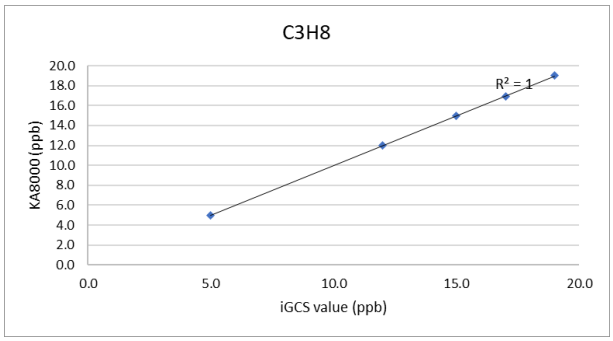
LINEARITY CHART EXAMPLES

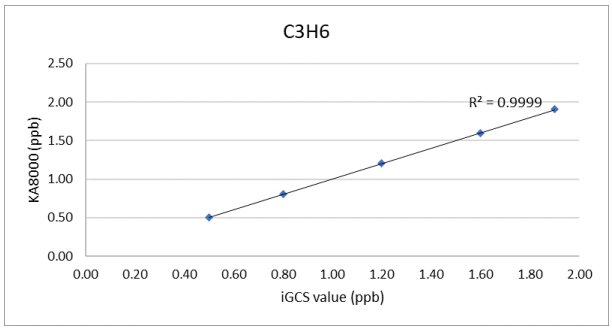


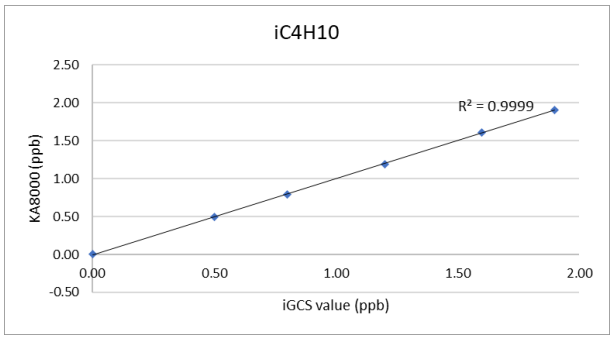


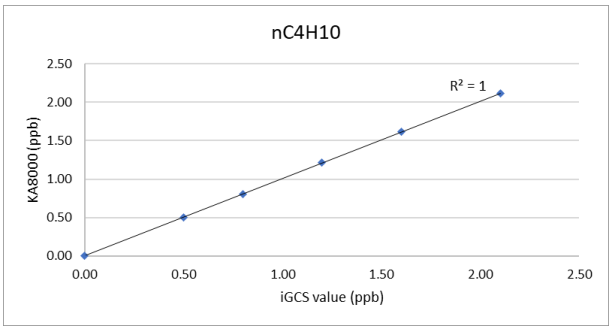


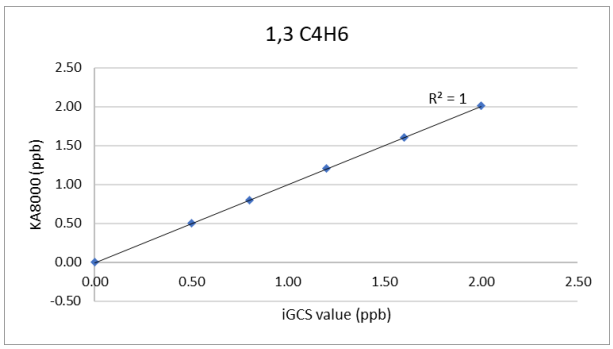










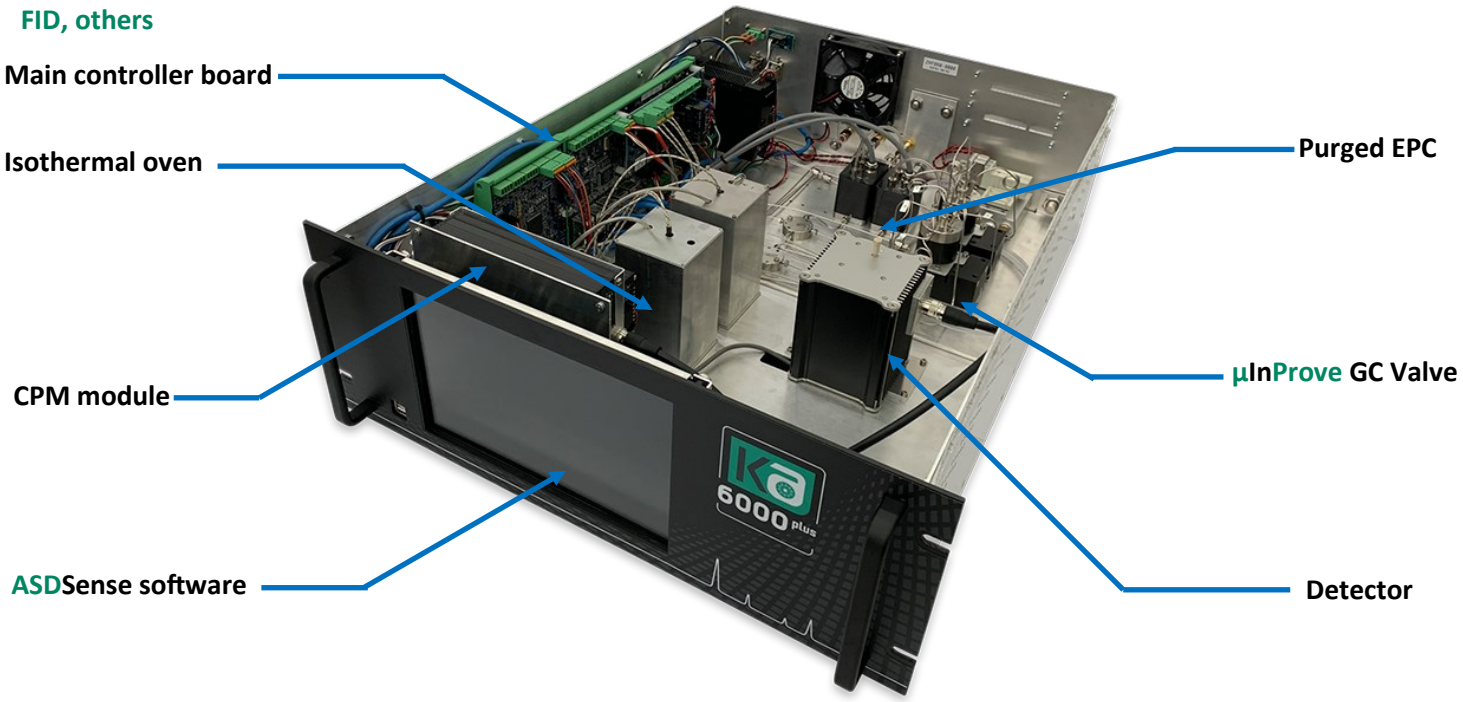


GCSense™ RACKMOUNT INDUSTRIAL GC

FOR GC INTEGRATORS THAT NEED A 19'' RACKMOUNT GC PLATFORM THAT IS ROBUST AND EASY TO CONFIGURE , THE GCSense IS THE PERFECT SOLUTION FOR YOU. IT CAN BE CUSTOMISED WITH DIFFERENT TYPES OF DETECTORS, VALVES, ELECTRONICS MODULES, ETC..

FEATURES

- Quick and easy configuration, no mechanical work required
- Up to 4 isothermal zones for columns
- Up to 5 chromatographic valves
- Up to 3 Electronic Pressure Controllers
- Up to 2 gas detectors : Epd**, ePID*, eDID**, TCD, FID, others
- Designed for 19'' rakcmount.
- Based on ASDSense Embedded robust GC software
- I/O modules: Isolated 4-20 mA outputs, Relay board, RS-232, Ethernet, Modbus
- External sampling system control (iS^4)

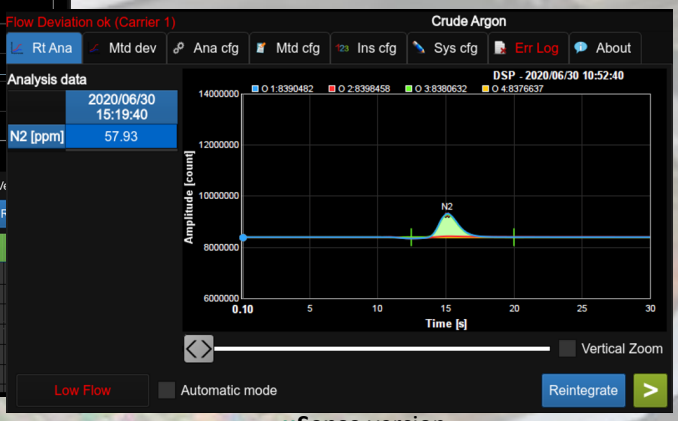


ASDSense

PROCESS GC SOFTWARE

EASE OF USE, ROBUSTNESS, INNOVATIVE

iMov and **GCSense** version

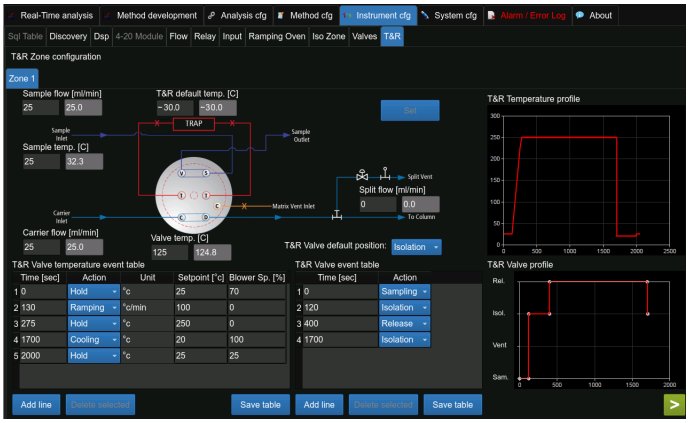


µSense version

THE ASDSense IS A POWERFUL GC SOFTWARE THAT RUNS ON ALL OUR OEM GC PLATFORM. IT HAS BEEN DESIGNED TO BE ROBUST FOR 24/7 PROCESS USE WITH LABORATORY LIKE DATA ANALYSIS FEATURES. ITS INTUITIVE AND FEATURE RICH SUCH AS MULTIPLE INNOVATIVE ADVANCED SIGNAL PROCESSING ALGORITHM, MAKES THE MOST POWERFUL AND VERSATILE PROCESS GC SOFTWARE.

FEATURES

- **Based on Industrial Real-Time Operating System**
- **Designed based on software redundancy for reliability**
- **Advanced signal processing**
  - ELOD (Enhanced LOD) algorithm
  - Peak remodeling
  - Baseline cancellation
- **Multi-methods capability with automatic sampling system synchronisation**
- **Data analysis**
  - Data and chromatogram review
  - Statistical analysis
- **Multiple calibration models available**
  - Linear and quadratic
  - Multi-points calibration
- **Password protected user access (3 levels)**
- **IIoT Ready**
  - Remote control
  - Support MQTT IIoT protocol for M2M communication
- **Digital relays, 4-20 mA, RS-232, Ethernet, Modbus**



Trap and Release menu

Flow diagnostic menu

ENHANCED FID DETECTOR

High Sensitivity, Robustness

FID IS ONE OF THE MOST WELL-KNOWN AND DOCUMENTED DETECTOR. THE DIFFERENCE BETWEEN A PREMIUM FID AND AN AVERAGE ONE IS DOWN TO DESIGN DETAILS ON BOTH THE MECHANICAL AND ELECTRICAL SIDES. SOMETHING WE UNDERSTAND WELL. THIS LEVEL OF DETAIL IS WHAT DIFFERENTIATE OUR FID.

FEATURES

- **< 20 ppb LOD CH_4 equivalent**
- **< 5 ppb LOD CH_4 equivalent with Enhanced LOD algorithm**
- **Low drift and improved noise with differential collector and electrometer design***
- **Low noise and low drift current electrometer**
- **ASDevices low noise electrometer power supply**
- **Inlet for capillary and packed column**

µInProve™ PURGED LIP SEALING VALVE

THE MOST RELIABLE AND DURABLE VALVE

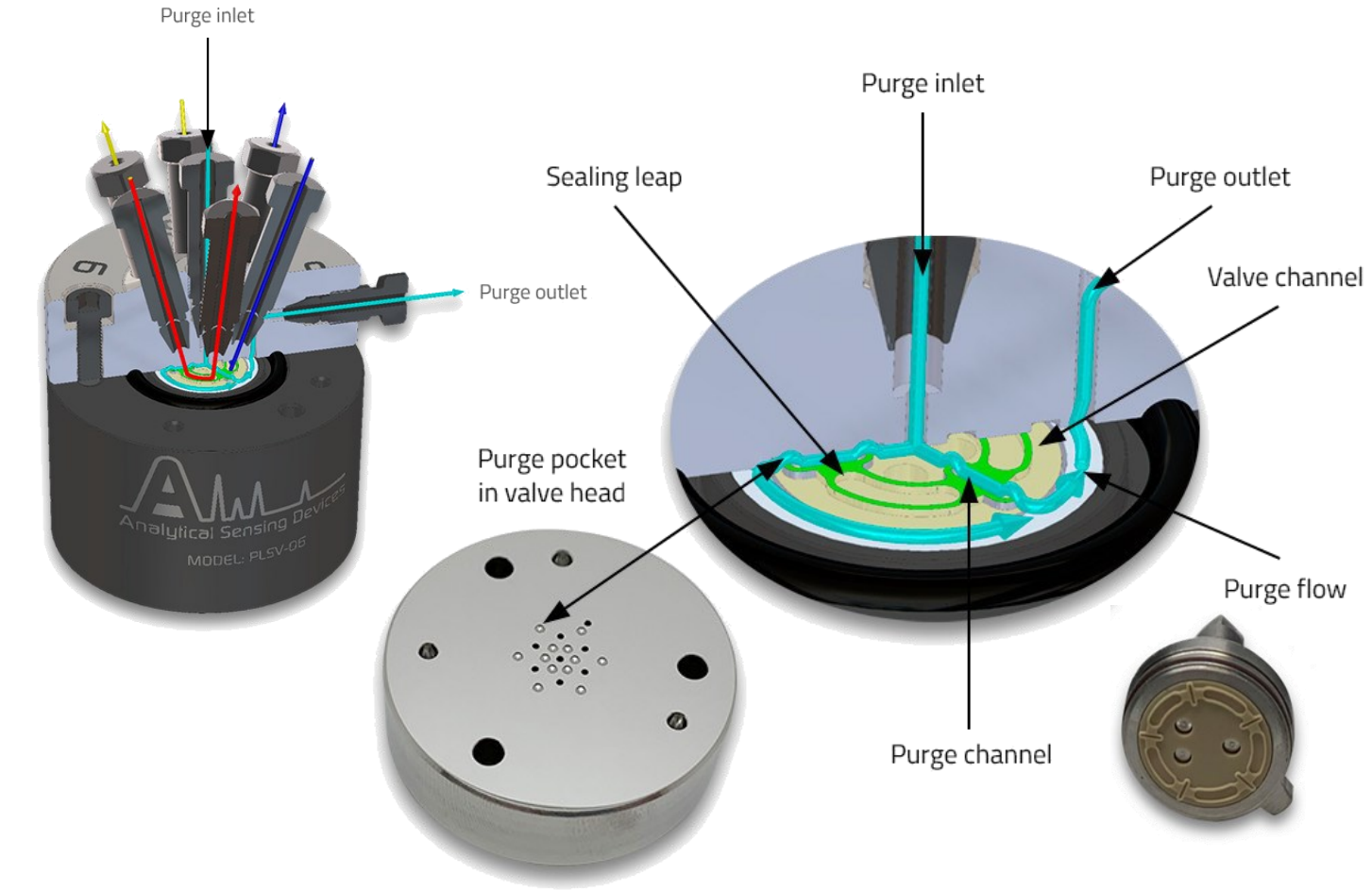
THE PLSV (PURGED LEAP SEALING VALVE) IS A DISRUPTIVE ANALYTICAL VALVE TECHNOLOGY THAT EXCEEDS THE LIFETIME OF A DIAPHRAGM VALVE AND HAS THE CONSTANT PRESSURE DROP AND THE SIMPLICITY OF A CONICAL ROTARY VALVE.

BY DESIGN, IT IS ALSO IMPOSSIBLE FOR THIS VALVE TO DEVELOP A CROSS PORT LEAK. THIS NEW TECHNOLOGY IS BASED ON A REDUCED SEALING SURFACE AREA OFFERED BY THE VALVE'S INSERT THAT REPLACES THE TRADITIONAL ROTOR AND AN INNOVATIVE PURGE SYSTEM.

THIS REVOLUTIONARY TECHNOLOGY HAS BEEN DESIGNED TO MEET OUR MOST ELEVATED STANDARDS THAT WE DEMAND FOR.

PLSV TECHNOLOGY FEATURES

- **No leak** - Inboard/outboard and cross port leaks are impossible due to unique purge technology[patent pending]
- **Long life time** - Over 1 million actuations in UHP applications due to unique reduced surface area insert technology[patent pending]
- **Constant pressure drop** - No change in pressure/flow drop characteristic across temperature range and life span
- **No dead volume** - Internal flow path contains no unswept volume
- **Small footprint** - With the use of our electrical or pneumatic compact actuator, install multiple valves in a constrained space, replacing diaphragm valve in existing



SPECIFICATIONS	
Analytical range [ppm]	0-2 ppm to 0-600 ppm depending on application
Limit of detection (3σ) [ppm]	See table below
Enhanced Limit of detection (eLOD) [ppm]	See table below
Linearity [%]	< 1%
Repeatability (σ) [%]	< 1% full scale range
Sensing technology	eFID (Enhanced FID)
Chromatographic valve	µInprove PLSV
Carrier gas inlet pressure requirement [PSIG]	90
Sample gas inlet pressure requirement [PSIG]	5 to 15
Carrier gas type	Nitrogen
Dimension (H x W X D) [mm]	312 x 483 x 508
Communication	RS-232, Ethernet, 4-20 mA outputs (optional)

STANDARD APPLICATION RANGE

IMPURITIES	MEASUREMENT RANGE [PPM]	LOD [PPM]
CH_4	600	0.1
C_2H_4	50	0.1
C_2H_6	250	0.1
C_2H_2	2	0.05
C_3H_8	20	0.05
C_3H_6	2	0.05
iC_4H_{10}	2	0.05
nC_4H_{10}	2	0.05
$1,3C_4H_6$	2	0.05

ORDERING MODEL NUMBER	IMPURITIES	MATRIX(ES)
KA6000-CFG4-PACK1-AAA	CH_4,C_2H_2,C_2H_4,C_2H_6,C_3H_8,C_3H_6,iC_4H_{10},nC_4H_{10},$1,3C_4H_6$	O_2 and Air

NOTE: *AAA IN THE MODEL NUMBER REPRESENTS THE RANGE. USE 001 FOR STANDARD RANGE OR 000 FOR CUSTOM RANGES.*

CHROMATOGRAPH WITH RECOMMENDED ACCESSORIES

ASDPure™ Carrier Gas Purifier

S4™ Sample Stream Selection System

GCS™ Gas Calibration System

