THE MOST COMPACT ARGON QUALITY ANALYSIS SOLUTION

KA CONFIG 1—PERMANENT GAS ANALYSIS IN ARGON

SOLUTION FEATURES

- **Performance** :
  - Down to < 50 ppb LOD based on Epd* technology (< 20 ppb with eLOD)
  - Linearity: < 1%
- **Ultra compact**
- **Robustness**
  - **µInProve*** GC valve
  - **µSense*** GC platform
  - Solid state Epd* sensor
- **Optional automated multi-stream analysis**
  - Analyse multiple streams sequentially
  - High sample integrity with iS^4
- **Full data analysis and reporting software**

KEY SPECIFICATIONS

- Impurities: H_2. O_2. N_2, CH_4, CO, CO_2
- Measurement range: 10 ppm to 100 ppm
- Matrix: Argon
- LDL: down to 50 ppb

TYPICAL APPLICATIONS

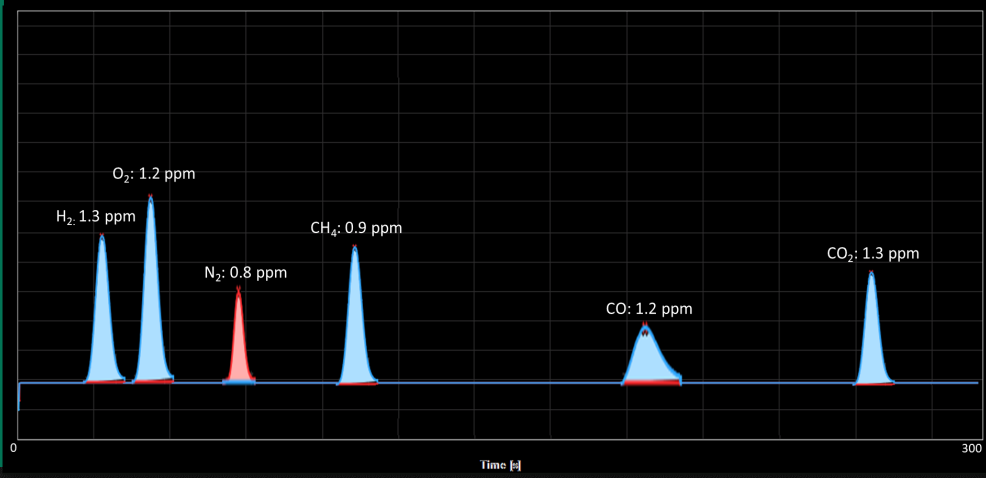
- Bottling centre
- Filling station
- Quality control

This argon quality analysis solution is the most compact on the market. Thanks to ASDevices high quality components, it delivers unsurpassed performance and all the features required for industrial gas manufacturers or any other application that needs argon quality analysis .

With the Epd* sensing technology which can be used with argon carrier gas, only simple chromatographic methods are used which improves design robustness and overall operational cost.

*Patent pending

CHROMATOGRAM EXAMPLE: IMPURITIES IN ARGON



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.

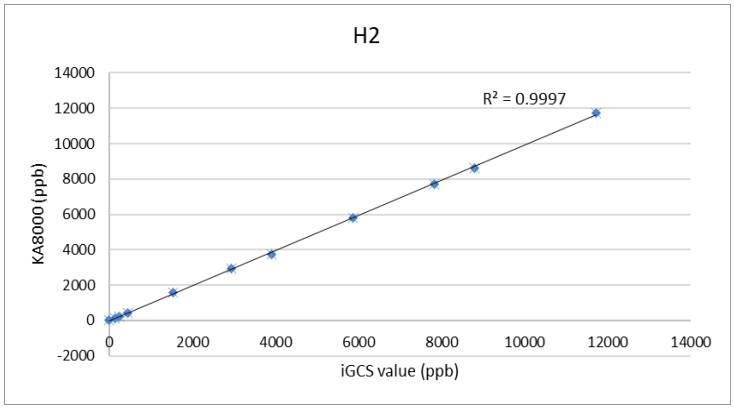
LIMIT OF DETECTION (LOD) AND METHOD LIMIT OF DETECTION (MDL)

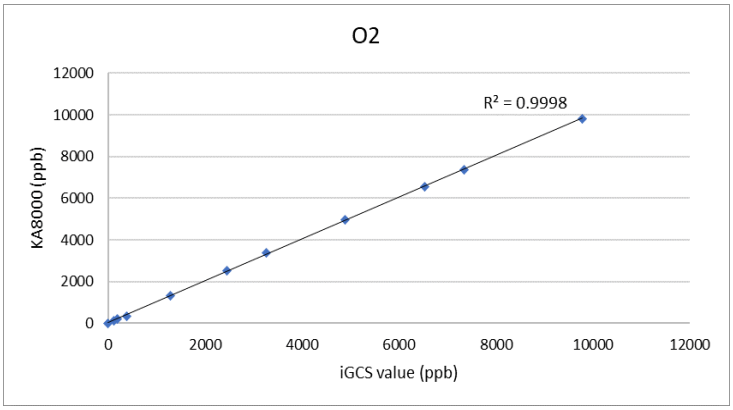
	Analysis #	H2 [PPM]	O2 [PPM]	N2 [PPM]	CH4 [PPM]	CO [PPM]	CO2 [PPM]
	1	482.0	502.0	551.0	479.0	452.0	482.0
	2	442.0	542.0	562.0	421.0	398.0	462.0
	3	485.0	551.0	549.0	462.0	482.0	459.0
	4	461.0	511.0	553.0	451.0	411.0	483.0
	5	481.0	532.0	561.0	470.0	481.0	422.0
	6	481.0	539.0	548.0	468.0	411.0	467.0
	7	449.0	516.0	562.0	423.0	498.0	483.0
	8	447.0	557.0	557.0	459.0	476.0	458.0
	9	489.0	529.0	564.0	432.0	402.0	436.0
	10	449.0	524.0	549.0	469.0	494.0	475.0
Without eLOD	σ	18.7	17.6	6.3	20.9	40.8	20.5
	MDL	56.0	52.7	18.9	62.7	122.3	61.4
	LOD	43	35	11	47	96	43
With eLOD	σ	6.2	5.9	2.1	7.0	13.6	6.8
	MDL	18.7	17.6	6.3	20.9	40.8	20.5
	LOD	14.3	11.7	3.7	15.7	32.0	14.3

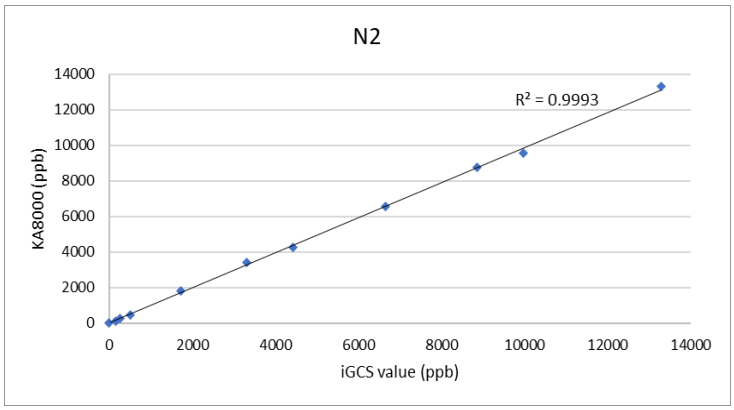
LINEARITY DATA

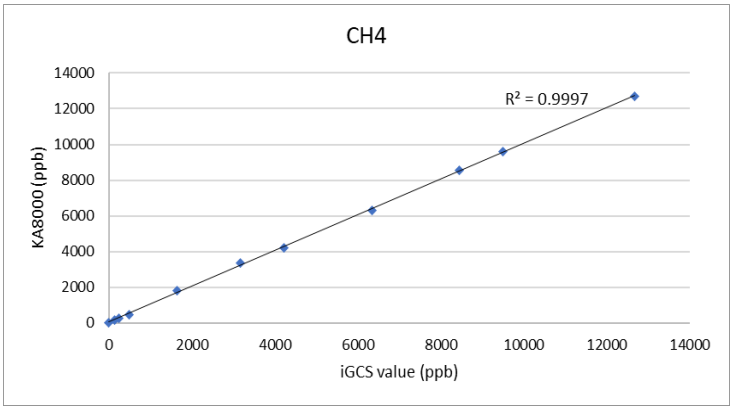
H2 [PPB]		O2 [PPB]		N2 [PPB]		CH4 [PPB]		CO [PPB]		CO2 [PPB]	
Reference	Reading	Reference	Reading	Reference	Reading	Reference	Reading	Reference	Reading	Reference	Reading
0	0	0	0	0	0	0	0	0	0	0	0
139	112	116	134	158	113	150	162	147	116	122	138
230	230	191	206	260	284	248	246	243	257	201	198
451	409	376	358	511	479	487	467	477	467	396	392
1529	1587	1276	1332	1733	1805	1653	1790	1619	1597	1343	1419
2931	2911	2446	2544	3324	3417	3169	3368	3103	3036	2574	2437
3909	3735	3262	3384	4433	4251	4225	4230	4138	4052	3433	3176
5864	5819	4894	4988	6649	6577	6339	6318	6208	6154	5150	5050
7819	7721	6525	6572	8866	8746	8452	8539	8278	8073	6867	6771
8797	8615	7341	7372	9974	9576	9508	9614	9312	9133	7725	7601
11729	11729	9788	9788	13299	13299	12678	12678	12416	12416	10300	10300

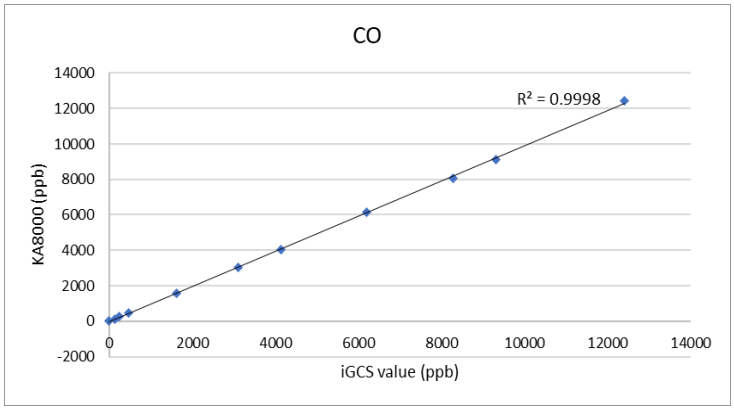
LINEARITY CHART EXAMPLES

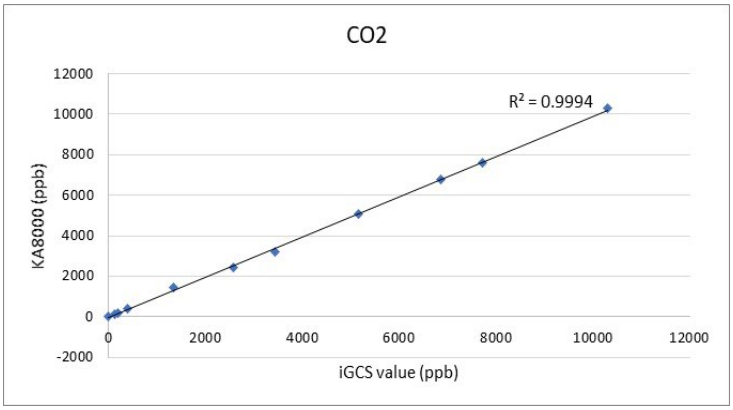












COMPACT PANELMOUNT OR PORTABLE GC PLATFORM

FOR GC INTEGRATORS THAT NEED A COMPACT GC SOLUTION, THIS ROBUST AND EASY TO CONFIGURE OEM GC IS THE PERFECT SOLUTION. IT CAN BE CUSTOMISED WITH DIFFERENT TYPES OF DETECTORS, VALVES, ELECTRONICS MODULES, ETC..

FEATURES

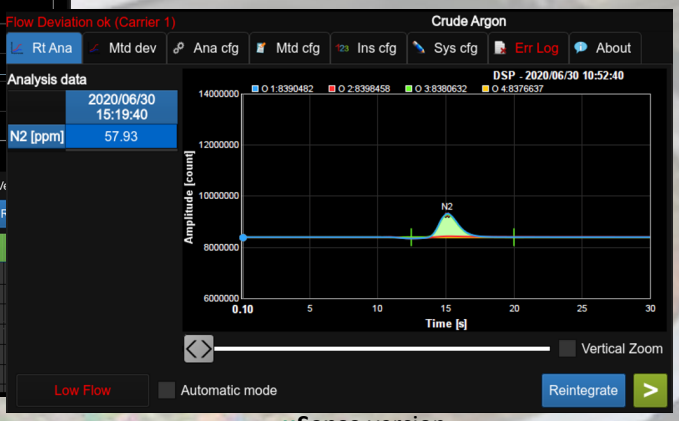
- Quick and easy configuration, no mechanical work required
- Up to 2 isothermal zones for columns
- Up to 3 chromatographic valve
- Up to 3 Electronic Pressure Controllers
- 1 gas detector : Epd**, ePID*, eDID**, TCD, FID, others
- Designed for panel mount. Optional 19'' rack mounting plate available.
- Based on ASDSense Embedded robust GC software
- I/O modules: Isolated 4-20 mA outputs, Relay board, RS-232, Ethernet, Modbus

ASDSense

PROCESS GC SOFTWARE

EASE OF USE, ROBUSTNESS, INNOVATIVE

iMov and **GCSense** version

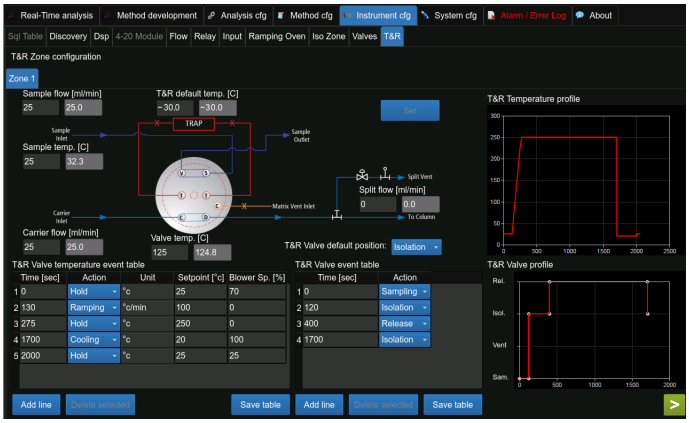


µSense version

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**

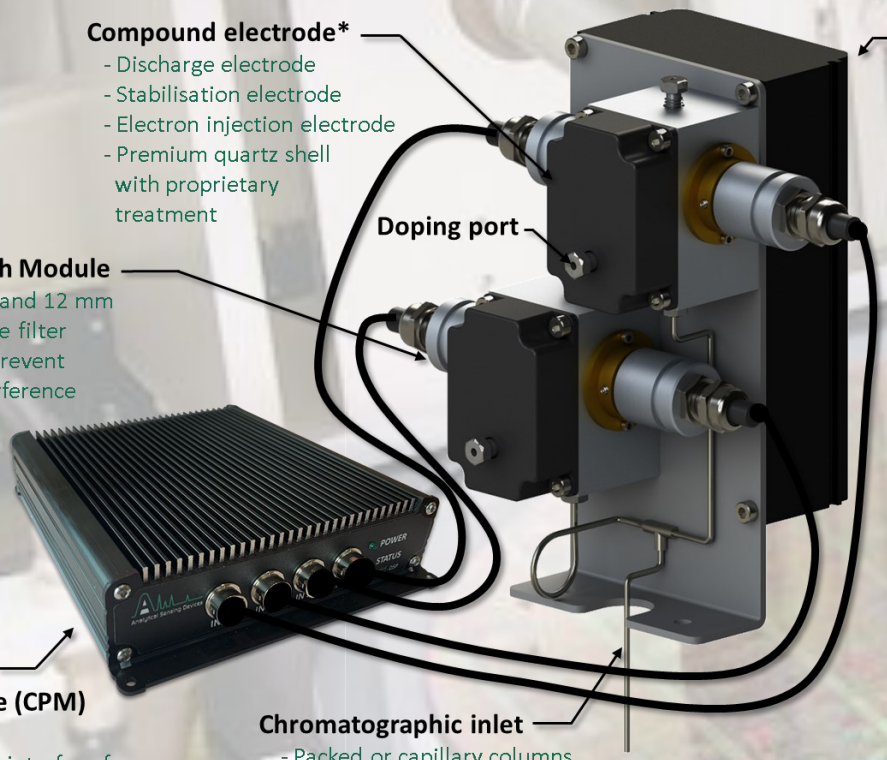


Trap and Release menu

Flow diagnostic menu

SePdd NG™ SCALABLE ENHANCED PLASMA DISCHARGE DETECTOR

A NEW SENSING TECHNOLOGY AND TOOLSET FOR CHROMATOGRAPHY



THE SEPDD IS A SCALABLE EPD* BASED DETECTOR ARCHITECTURE. IT IS NOT JUST A GC DETECTOR, IT'S A COMPLETE SYSTEM. AVAILABLE IN 3 CONFIGURATIONS (DUO, TWIN AND QUATTRO), OPTIMISE AND SIMPLIFY YOUR CHROMATOGRAPHY LIKE YOU NEVER DID BEFORE. WITH THE CPM PLATFORM, TURN THE SEPDD INTO A FULL FEATURE COST-EFFECTIVE GC SOLUTION.

FEATURES

- **Up to 2 detectors for the price of one**
  - **SePdd** available in Duo, Quattro and Twin versions
- **Epd technology***
  - Discharge cell available in metal or ceramic
  - Unique compound electrode* that can withstand high temperature, high pressure and sub-atmospheric pressure
  - Plasma stabilisation and electron injection electrodes*
- **Optimised for packed, µPacked and Capillary columns**
- **Using configurable optical wavelength module**
- **Integrate it on any existing GC platform**
- **ppt to % measurement range**
- Alternative to DID, PDHID, ECD, FPD, PFPD, SCD, FID, TCD, Mass Spectrometer and former PED technologies
- Compatible with argon, helium, nitrogen, oxygen, CO_2 and hydrogen carrier

µInProve™ PURGED LIP SEALING VALVE

THE MOST RELIABLE AND DURABLE VALVE

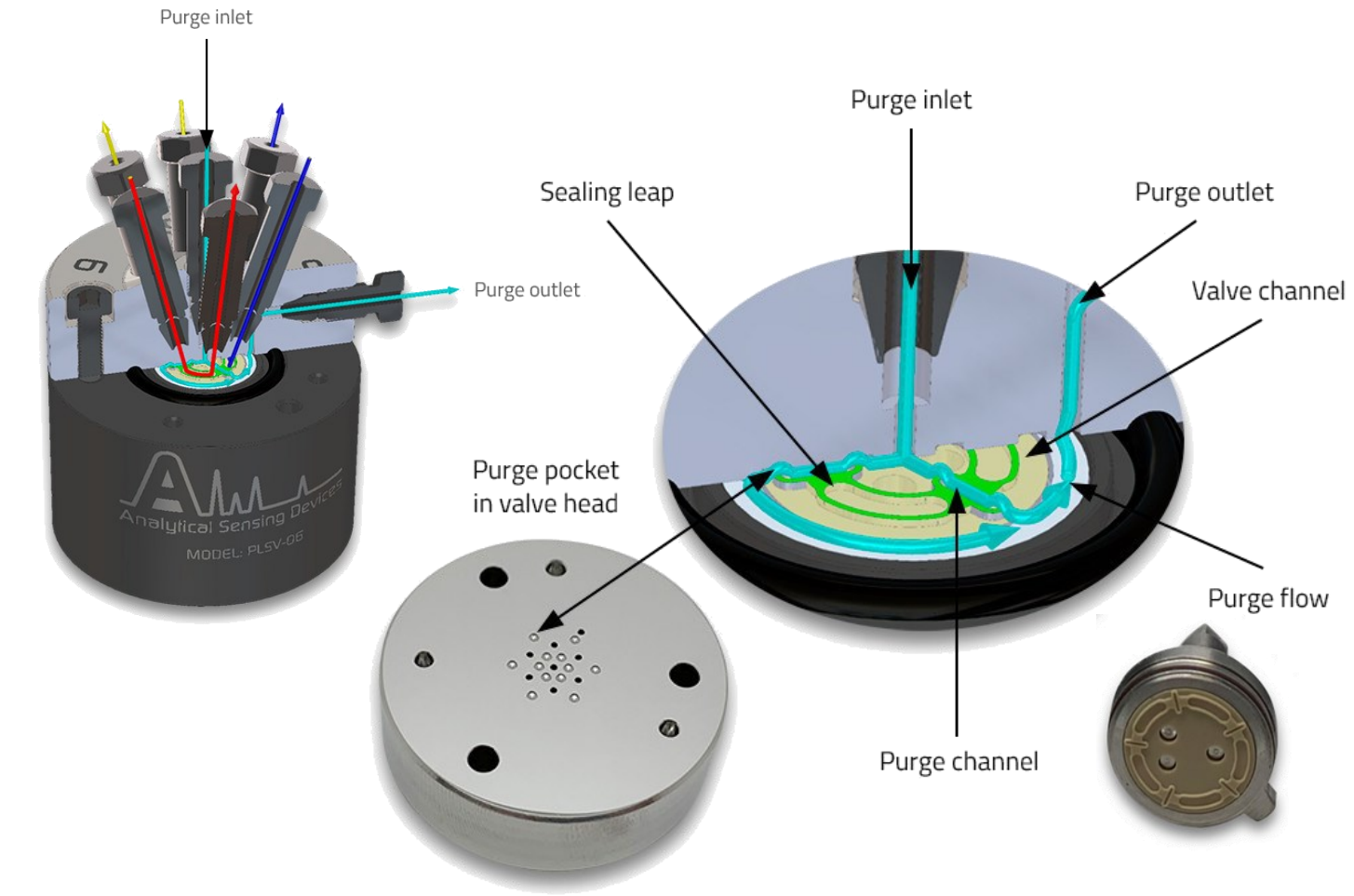
THE PLSV (PURGED LEAP SEALING VALVE) IS A DISRUPTIVE ANALYTICAL VALVE TECHNOLOGY THAT EXCEEDS THE LIFETIME OF A DIAPHRAGM VALVE AND HAS THE CONSTANT PRESSURE DROP AND THE SIMPLICITY OF A CONICAL ROTARY VALVE.

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]	0-10 or 0-100
Limit of detection (3σ) [ppm]	0.5% of range (except CO 1% of range)
Enhanced Limit of detection (eLOD) [ppm]	0.2% of range (except CO 0.4% of range)
Linearity [%]	< 1%
Repeatability (σ) [%]	< 1% full scale range
Sensing technology	Enhanced Plasma Detector (Epd)
Chromatographic valve	uInprove PLSV
Carrier gas inlet pressure requirement [PSIG]	90
Sample gas inlet pressure requirement [PSIG]	5 to 15
Carrier gas type	Purified argon 5N
Dimension (H x W X D) [mm]	132 x 202 x 610 The instrument is provided with a 19'' rackmount mounting plate
Communication	RS-232, Ethernet, 4-20 mA (Optional)

ORDERING MODEL NUMBER	IMPURITIES	MATRIX(ES)
KA5000-CFG1-PACK1-AAA	H_2, O_2, N_2, CH_4, CO	Argon
KA5000-CFG1-PACK2-AAA	H_2, O_2, N_2, CH_4, CO, CO_2	Argon
KA5000-CFG1-PACK3-AAA	CO_2	Argon

NOTE: *AAA IN THE MODEL NUMBER REPRESENTS THE RANGE. USE 010 FOR 10 PPM AND 100 FOR 100 PPM*

CHROMATOGRAPH WITH RECOMMENDED ACCESSORIES

Carrier Gas Purifier Sample Stream Selection System Gas Calibration System