ASDevices — Improving the past... Redefining The Future

PAPS™

5 Liters / minute End of Life (EoL) version

THE FIRST NOBLE GAS PURIFIER WITH BUILT-IN REAL-TIME END OF LIFE DETECTION*

ASDevices offers the unique End of Life (EoL) technology* and the extended life time option* in its innovative iPaps. The iPaps is a getter-based purifier for carrier gas purpose that is offered with a two heat purification vessels process.

UNIQUE FEATURES

- Noble gas purifier for GC carrier gas, zero reference and calibration gas
- Built-in End of Life (EoL) detector*
  - Based on our Pulse Discharge Optical Feedback Detector (PDOFD)*
- Optional extended life time technology*
- Advanced diagnostic
  - Automatic shut down in case of system pollution
  - Monitor gas supply pressure to detect low pressure bottle
  - Automatic gas type detection
  - User programmable alarm level
  - Ethernet / IIoT ready
- Low flow consumption
- No maintenance required

DUAL VESSEL PURIFICATION PROCESS

The proprietary dual stage purification design unlocks a better purification process and higher performance.

1. High temperature (400 °C) first stage to remove all the main impurities such as O_2, N_2, HCs, CO, CO_2, H_2O, VOCs
2. Lower temperature (180 °C) second stage to remove H_2

Dual vessel purification process

ENHANCED BY

Liplok™ FITTING TECHNOLOGY

Better leak integrity | **Leak detection capability** | **No dead volume**

Backward compatible with Swagelok™ standard double ferrule fitting

Printed in Canada

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* = patent pending

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BRINGING ASDevices DISRUPTIVE TOUCH TO THE PURIFICATION INDUSTRY

ISN'T IT THE EXPENSIVE WAY?

Chromatograph carrier gas quality is extremely important as it impacts dramatically the GC performance and can also cause complete shutdown. For instruments requiring a purified gas to generate a zero calibration point, a polluted gas causes a calibration error. Despite being so critical, there is currently no cost effective technology to detect or predict a purifier's end of life. Most users still rely on an instrumentation specialist's judgement and instrument performance to decide if a purifier's end of life has been reached. When it occurs, it is often too late. Isn't it the expensive way?

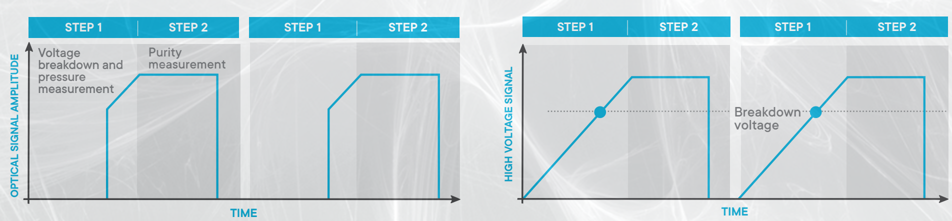
Our new technologies* address two main problems associated with current purifiers. It offers a true real-time end of life detector (not an estimation) and an optional getter life time extender.

END OF LIFE (EOL) DETECTION TECHNOLOGY*

Our purifier End of Life technology is based on a Pulse Discharge Optical Feedback Detector (PDOFD)*. The innovation of this technology is related to the dual use of a feedback system comprising a low cost optical measurement device and pulse discharge generator. All of this is controlled by a proprietary algorithm and integrated in a compact and low cost design. As a first step, the gas breakdown voltage is detected by ramping a pulsed and frequency modulated high voltage signal across two electrodes that are in direct contact with the gas. The two electrodes are specially designed with a proprietary long lasting material which is the outcome of many years of research.

The breakdown voltage, which is identified optically when the discharge starts, is a function of the detector internal gas pressure. Consequently, the breakdown voltage is used as a mean to monitor the detector internal pressure without the use of an expensive standalone pressure sensor. As a second step, the discharge is maintained and stabilized by an algorithm which stabilizes the discharge current. From the discharge, an optical measurement is done and the gas purity measurement is obtained. A key region of the optical spectrum is monitored to provide a universal measurement to molecules such as H_2, O_2, N_2, CH_4, CO, CO_2 and H_2O.

As a stable long term measurement is required, the measured pressure is used to compensate the purity measurement. Without this compensation, the measurement would be unstable and not usable as a detection limit below 10 ppb is required. This two-step process is repeated continuously to provide a real-time purifier end of life detector. The end of life occurs when the gas purity measurement exceeds a threshold which can be configured by the user.



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* = patent pending

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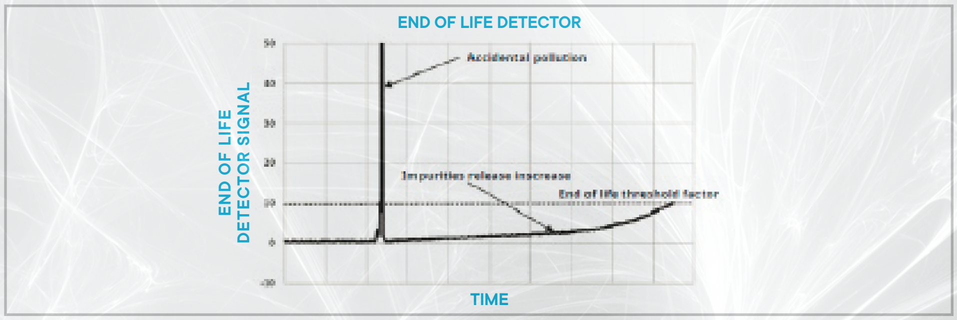
As the technology can measure the detector internal pressure, it is also used to provide further diagnostic. When coupled with a detector outlet shut-off valve, it is possible to pressurize the detector to that of the purifier supply pressure and monitor the gas system delivery pressure. With this feature, notifications can be sent to the users and prevent catastrophic events such as gas bottles that are running low. This is very often costly as purifiers are most of the time damaged and all instruments polluted.

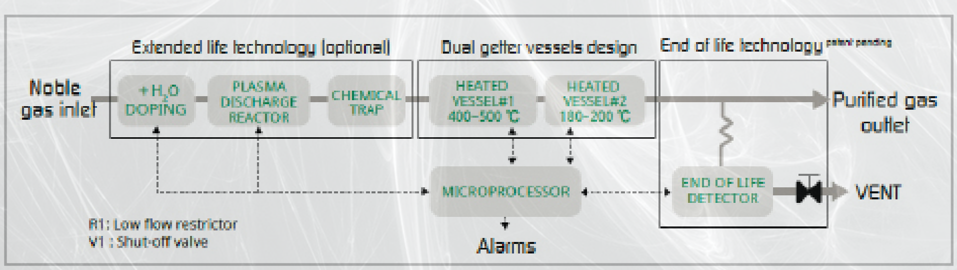


Finally, this technology provides even more benefits. As the breakdown voltage is gas type dependent, the algorithm can also detect which gas is being purified or if a major air pollution is occurring. It is also used to provide an automated purifier start-up procedure that only heats the getter when a proper gas, argon or helium for example, is flowing through the purifier. It is not uncommon for purifiers to be damaged from the start.

EXTENDING LIFE TIME*

Generally, when a heated getter alloy based purifier reaches or gets close to its end of life, the first impurities to break through will be N_2 followed by CH_4. The technology allows the reduction of the N_2 and CH_4 load on the getter alloy by reacting them in a plasma reactor pre-stage doped with H_2O. They are transformed into NOX, H_2O, CO, and CO_2 that are more easily trapped in an intermediate chemical trap. This way the getter alloy sees considerably less impurities and its life time is extended.

As all those features can be integrated at a very low cost and in a compact design. It makes this technology a must have for every purification systems and render obsolete competing ones.



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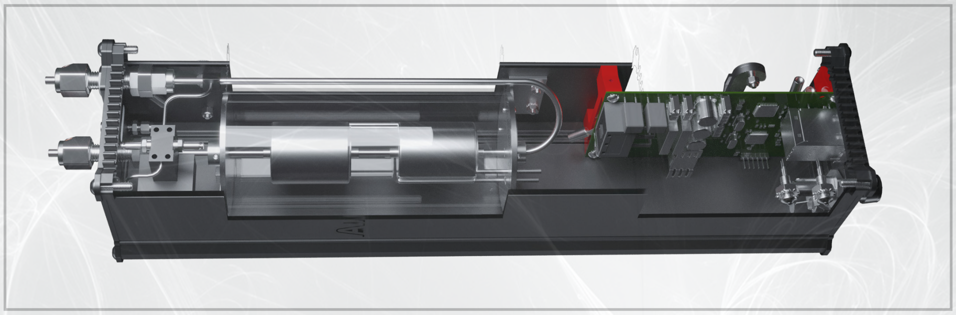
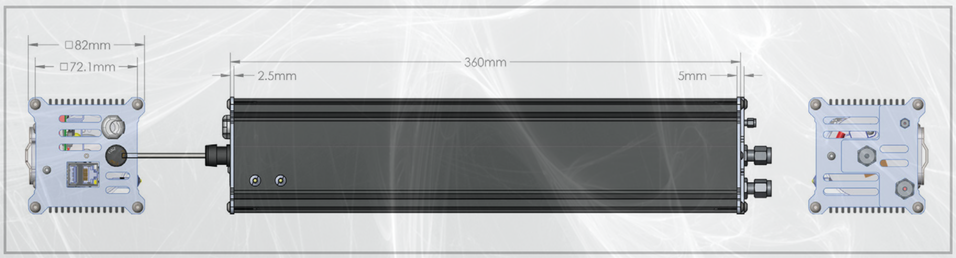


SPECIFICATIONS*	
Gas purified	Ar, He, Ne, Xe, Kr (N_2 in option)
Impurities removed	VOC, BTEX, H_2O, H_2, O_2, N_2, CH_4, CO, CO_2, THC
Impurity level achievable	1 ppb
Nominal flow	5 L/min
Life time at nominal flow	2 years (4 years with Extended life time option)
Fittings	ASD LipLOK™ fitting, compatible with instrumentation double ferrule type or VCRTM
End of Life detector gas consumption	5 L/min
Supply	115 VAC or 220 VAC, 50-60 Hz
Power consumption	Max 260 watts
Weight	6 kg (13,23 lbs)
Dimensions (H x W x D)	60 x 10 x 10 cm (23,62 x 3,94 x 3,94 in)

*Specifications are subject to change without prior or further notices.



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