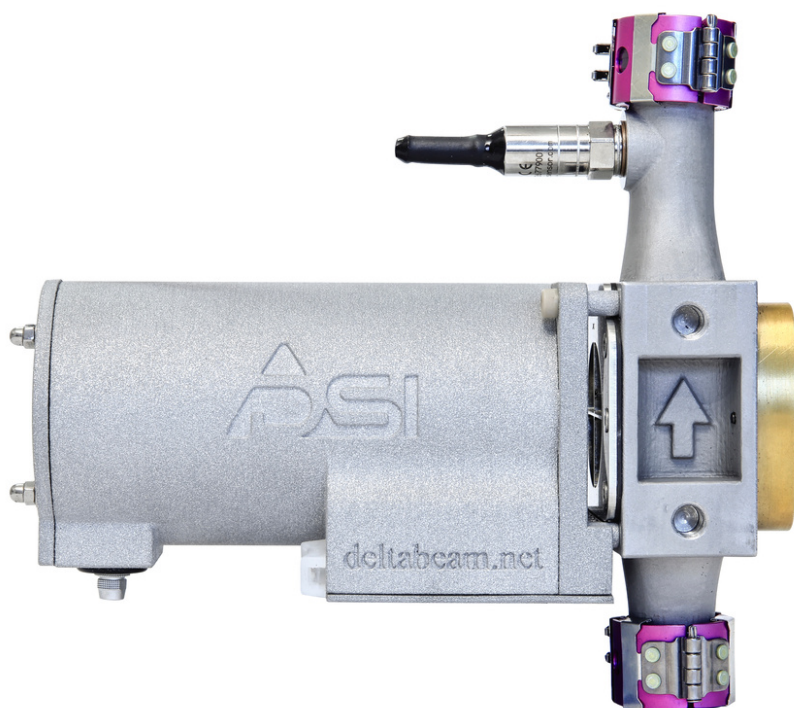




SC AIR-X

Oil Aeration Measurement



TECHNICAL BROCHURE

AIR-X, THE RIGHT TOOL TO MEASURE OIL AERATION

Air-X equipment is designed for on-line lubricant aeration monitoring within a running mechanical system: engines, gear boxes, turbojets and lubrication units.

The operating principle is based on an accurate density measurement using X-ray transmission. An oil sample coming from the mechanical system is flowing continuously through a measuring sensor where the density measurement is continuously performed.



Air-X technology allows the instrument to perform on-line measurements using a very low activity X-ray source. The chamber is self-shielded so that no radiation at all comes out from the unit whatever the operating conditions.

The total volume of oil sampled in Air-X is less than 0.3 liter for a minimal impact on the operating mechanical system.

The sensor includes probes that are used for automatic temperature and pressure compensation. Therefore, the air content can be computed and displayed at Standard conditions ($T = 25^{\circ}\text{C}$ and $p = 1 \text{ atm}$).

The presence of air in the fluid of a working hydraulic system can lead to bad consequences. Mixed air may be in an entrained or dissolved state and it can directly affect fluid parameters such as density, bulk modulus, etc.

Consequences can be the following :

- Loss of lubricity
- Higher oil temperatures
- Wasted horsepower
- Cavitation problems
- Noisy operation

On engines, high aeration rates could occurs when :

- Underfilling or overfilling of oil pans
- Insufficient blow by oil mist separation
- Ineffective design and positioning of oil intake and wash plate within oil pan
- Shorter rest time of lubricant within oil pan due to high flow rate
- High speed cornering
- Inappropriate oil formulation

SC Air-X offers a wide range of applications where oil aeration is critical :



Aerospace

Wide operating range from 0% to 100% air-in-oil capabilities



Automotive

High accuracy and repeatability compared to conventional methods



Motorsport industry

Onboard measurement and scavenging applications



Off-road

Engine tilting limits and hydraulic circuit monitoring



Air-X is able to sample and evaluate oil from atmospheric or pressurized lines in an operating hydraulic system.

Particularly suitable for stationary dyno, tilt rig, on-board and dry sump applications, it is a lightweight and ruggedized compact measuring chamber to be fitted close to the mechanical system. The electronics is deported to reduce the size at its best.

All measurement data (oil temperature, oil pressure and gas content) are recorded and can be visualized on a graphic during operation of Air-X. A dedicated routine is also provided, which allows converting the results to a .csv format. Results are displayed in real-time and communicated to test bed management system.

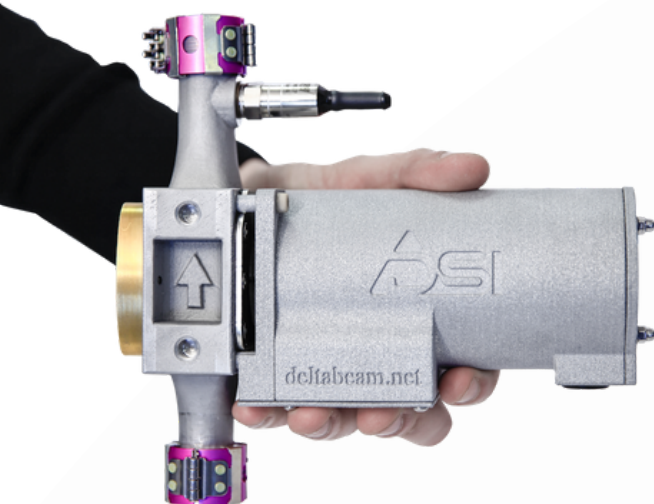
DSi team has acquired a strong expertise in assisting engineers to understand and solve oil aeration problems.

A software package is supplied with Air-X, and offers the following functions :

- Setting-up of equipment
- Calibration
- On-line measurement and data logging
- Data visualisation and analysis

Our team of experts are at your services :

- On-site service measurement with Air-X at your facility
- Engine Test Center equipped with Air-X
- Oil aeration problem solving, cause and failure analysis
- Training on the aeration process (theoretical and practice)
- Design and manufacturing of dedicated test rigs for benchmarking hydraulic devices (Air-Mix for Air-in-oil production)



Super Compact Air-X performances

Accuracy (vs acquisition time)

0,5% : 10 sec

0,2% : 100 sec

Measuring range (gas content)

0% to 100% air in fluid

Operating T° range

-40°C to 140°C (high temp. on request)

On-line results

Response time from 1 sec to several minutes

Oil flow rate range in aeration measuring chamber

0,5 L/min to 20 L/min

20 L/min to 80 L/min (high flow on request)

Measurement possibility

On-board or on test benches

Pressure range

Up to 4 bars gauge (more on request)

Calibration

Self calibration by end-user

Power requirements

110-220VAC/60-50Hz (on demand)

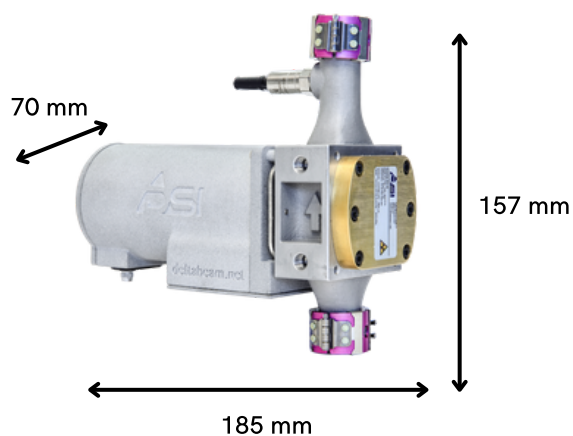
Power consumption

< 1 kW

Super-Compact Air-X dimensions and weight

Air-X weight

1,2 kg





YOUR RELIABLE PARTNER FOR THE DEVELOPMENT OF ENGINES & LUBRICANTS

For 20 years, DSi has supplied industrial equipment to offer accurate engine and lubricant testing.

DSi is a range of innovative services designed to enhance your R&D and is a world leader in the use of radiotracer techniques.

Our customers are from the automotive, lubricant, and aeronautic industries. We work as R&D partners for the development of new products and for a quick solving of your technical problems.



We supply industrial equipment and measurement services worldwide such as :

- Engine oil consumption
- Oil Aeration measurement
- Engine wear measurement
- Fuel dilution measurement
- After treatment systems
- Test rigs and ancillary equipment
- Tribology and aeronautics
- Valvetrain and cylinder head test stand

Our R&D programs are presently carried out in cooperation with the following research centres :



UNIVERSITY OF
BIRMINGHAM



UCLouvain



UNIVERSITÉ
LIBRE
DE BRUXELLES



DSi offers industrial products for engine and lubricant testing.

Why should you work with DSi ?

- ✓ Selecting DSi is choosing a fully independent contract service centre with modern engine test equipment associated to innovative radiotracing tools.
- ✓ The real-time results produced by our equipment offers a significant reduction of your development time and associated testing costs.
- ✓ Our highly qualified and experienced technical staff always keep informed our customers continuously during every project.
- ✓ The strength of DSi is the motivation generated by our passion and shared with our customers.
- ✓ The advanced technology and flexibility of our company creates new possibilities to our clients by developing customised and unique solutions.



CUSTOMER SATISFACTION



INNOVATION



PASSION



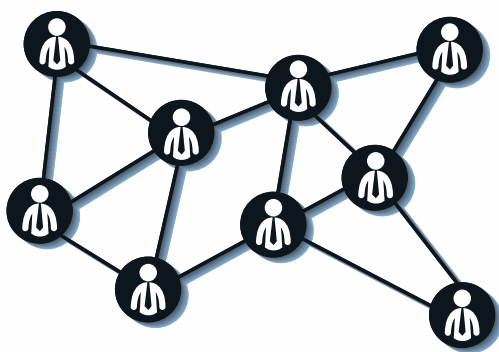
QUALITY



TEAM SPIRIT



MISSION



STAY CONNECTED TO



AT ANYTIME, ANYWHERE !



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