Thermo Scientific
ARL 3460 Metals Analyzer

Improving Productivity of Your Operations

The worldwide reference in optical emission
More than 5000 units installed since launch

Excellent sensitivity, reproducibility and accuracy

Best stability and reliability, minimal argon consumption and lowest total costs of ownership

Line selection in the range 130 to 780 nm, allowing analysis from low C, N and O to alkaline elements
ARL 3460
Exceptional History

For over 70 years, our company has set the standard for instrumental analysis of metals. A continuous stream of innovative products using optical emission and X-ray spectroscopy has been the cornerstone around which that long and successful tradition of leadership has been built. The first model of the Thermo Scientific ARL 3460 was launched in 1982 and it is, since then, the most widely used optical emission spectrometer in the world. The delivery of the 5000th unit was celebrated at the beginning of 2005.

Fast and Accurate
As a multi-channel optical emission spectrometer, the Thermo Scientific ARL 3460 is designed for fast, accurate metals analysis in:
- Primary metal producing plants
- Foundries, forges, mini-mills
- Casting operations
- Incoming material control
- Metals QC and R&D laboratories

The ARL 3460 is custom designed for meeting any customer specific requirements.

Unrivaled Reproducibility, Reliability and Stability
A well proven, one meter Paschen-Runge optics mounted into a vacuum stabilized cast iron body is at the heart of the system, providing unrivaled reproducibility, reliability and stability over both the short and long term. This brings the following advantages:
- Less time spent on recalibration
- More time available for the productive analyses

The cabinet is also ergonomically designed to allow the sample and its identification to be rapidly input by a standing operator, thus avoiding wasted seconds and further optimizing result turnaround times.

Highest Productivity, Lowest Costs of Ownership
Over the years the ARL 3460 has undergone constant improvements in analytical performance and has become the best tool in increasing your productivity. Due to continuous evolution of the optical components, electronics and software, we were able to decrease all costs of ownership.

Unparalleled Performance
Our company has a wealth of experience in analyzing almost every type of metal and thereby can only provide an exceptional product that meets or exceeds every customer’s requirements.

This experience extends to the less common metallic materials. When it comes to the analysis of materials producing toxic vapours, such as zinc and lead, the special exhaust system of the ARL 3460 ensures maximum safety of the operator.

Nitrogen/Oxygen Analysis
Traditionally handled by combustion analyzers, the analysis of N and O can now be performed by optical emission spectrometers. Today, more than 1000 installed ARL 3460 analyze nitrogen in steels and many analyze oxygen in steel and copper alloys.
**Turn-Key Operation**

The ARL 3460 is configured and calibrated in the factory before delivery.

We are fully aware that accuracy, which depends on the calibration of the instrument, is the most important figure of merit required from a spectrometer. Our factory calibrations performed with CARL (a very sophisticated multi-variable regression software tool that corrects for matrix effects as well as for spectral interferences), ensures the customer the highest possible accuracy. CARL provides an immediate «turn-key» instrument ready to analyze customer samples on the installation day.

**ARL 3460 Advantage**

Derived from the standard ARL 3460, the ARL 3460 Advantage shares with its superior stability, reliability, repeatability and long lifetime with lowest running and maintenance costs. It has been designed to address the analytical needs of foundries and metal processing industries dealing with cast iron, steel or aluminum products.

The ARL 3460 Advantage is factory calibrated for most accurate and uncompromising analytical performance like all Thermo Scientific optical emission spectrometers.

**OXSAS Software: the most powerful operations made easy**

OXSAS software outperforms software that is currently available on the market today for metals analysis by OES. OXSAS provides virtually unlimited analytical capacity and flexibility and will therefore meet your needs throughout your instrument’s lifetime:

- Triple navigation style: menus, tree and icons to accommodate individual preferences
- Simple one-click routine analysis launch
- Quantitative analysis using tasks with analysis parameter template
- Access to various functional levels through password protected user accounts allowing for secured operation
- One click access to recent analyses results, readily available for comparison in the analysis screen
- Full traceability

These are just a few of the many features contributing to the fast and easy routine operation of OXSAS.

**Your Partner In Productivity**

Our company is not only your supplier, but also your partner in productivity who offers you complete analytical solutions backed up by the following statements:

- Regular «firsts» in spectrometry, software and automation for over 70 years
- Tens of thousands of OES & X-ray systems already supplied in the world
- Continuous improvements of analytical performance and shorter analysis times
- Easy integration to increase productivity
- Unrivaled reputation for quality, stability, reliability and long lifetime
- Easy to use, easy to upgrade
- The OES/X-ray manufacturing facility in Ecublens, Switzerland is ISO 9001:2000 certified
- Worldwide customer support network

To keep you informed about our latest developments, please visit [www.thermo.com/oes](http://www.thermo.com/oes).

**Improve The Quality of Your Products**

The design of the Thermo Scientific ARL 3460 combines high performance with rugged construction and operational convenience with reliable operation. The productivity needed by a modern metals production is optimized by the system providing fast, accurate results, day-by-day, month-by-month and year-by-year. This will ensure the best quality of your own products.
ARL 3460 Specifications

Spectrometer

Spectrometer design: Paschen-Runge vacuum polychromator made of special cast iron and temperature controlled to ± 0.1° at 38°C. Maximum 60 channels.

- Focal length: 1 m
- Primary slit width: 20 µm
- Secondary slit width: 20, 25, 37.5, 50, 75, 100, 150 µm
- Type of detector: Photomultiplier tube 28 mm, 10-stage side window tubes, fused quartz, glass or MgF₂ windows

Grating type: 1080, 1667 or 2160 gr/mm, selected by analytical task

Resolution: Dependent on grating, secondary slit and spectral order

Sample stand: Argon flushed, water-cooled table with self-contained, closed loop cooling system

Electronics

Spectrometer control: ARL MM8 386 Microprocessor utilizing CMOS technology with Status Measuring Card. A/D converters and attenuators included for each channel.

Programmable attenuators: Up to 24, available as an option

Dynamic range: 10⁻¹

Enclosure: Built-in dust protection with high capacity cooling fans

Requirements

Ambient temperature: 16-30°C (62-86°F); maximum gradient 5° C/hour

Relative humidity: 20-80 %

Voltage: 230 V (+10 %/-15 %), single-phase with protective ground (5kVA regulator required if fluctuations exceed ±10 %)

Current: 12 A, including PC, screen and printer

Frequency: 50 or 60 Hz

Grounding: < 1 Ω

Argon: > 99.996 % maximum 5 ppm oxygen (maximum 2 ppm oxygen for samples with high Si content). Optional argon purifier available and recommended for low carbon analysis. For VUV lines (nitrogen, oxygen, chlorine), argon purifier included

Consumption

Electrical power: Max 3.5 kVA

Argon: 3.5 l/min during analysis, 0.35 l/min stand-by

Compliance to norms: 96/37/EEC Machinery

73/23/EEC Low voltage material

89/336/EEC Electromagnetic compatibility

Dimensions and weight

Overall dimensions: 166.5 x 91 x 119 cm or 65 x 47 x 36 inches, including excitation stand

Weight: 450 kg or 992 lb approximately

Accessories and options:

Small samples analysis kit

Argon purification systems

Voltage stabilization systems

Uninterruptible Power Supply (UPS)

Suction device accessory to exhaust toxic fumes

Stand upgrade for semi-automatic operation

Data communication software options

Analytical results processing software options