Technical specifications	Description
Test method	ASTM D3241, IP 323, ISO 6249 Up to 21 programmable test methods
Test Temperature	Programmable from 100°C up to 380°C
Differential Pressure	0 – 750 mmHg (automatically bypassed at + 700 mmHg)
Test time Range	Programmable from 4 to 600 minutes
Fuel Aeration	Programmable time, automatic air flow control
Aeration Flow rate	Programmable or according to test method, 1.5 L / min
Air Flow Humidity	Humidity sensor with displayed message for dessicant replacement
Heater tube temperature measurement	Thermocouple Type K, class 1
Fuel Flow	Dual 5 mL syringe, maintenance free, programmable fuel flow rate or according to test method Accuracy ±1% No flow pulse or peak
Bus Bar Temperature Control	Independent and programmable, each bus bar temperature can be adjusted No liquid cooling circulation Peltier modules + heat pipe technology
Heater tube section assembling	Special gauge to quickly and perfectly position the heater tube
Fuel vapor handling	Dedicated compartment with sliding doors acting like fume hood encompassing beakers and heater tube section, connectable to a fume extractor
Diagnostic and Service	Dedicated service menu with a flow chart layout with ability to click on each symbolic element to check its operation
DR10 – ITR connectivity	Via Ethernet port RJ45 Full test results can be automatically transferred from the DR10 to the TO10
Results storage	Result database Limited only to capacity of external device
LAN connectivity	Ethernet port RJ45
Printer output	USB (printer is optional)
Data output	USB (2), Ethernet
Dimensions (mm)	440 x 600 x 670 (17”x 23”x 26”)
Weight	75 kg (165lbs.)
Electrical	100 to 240V - 8 A - 50/60 Hz
Operating temperature	From +10 to +35°C
Relative humidity	20% to 90% non-condensing

We reserve the right to alter specifications without notification.

Your local distributor:

Distributed in Canada by:
ATS Scientific Inc.
4030 Mainway
Burlington, ON L7M 4B9
1-800-661-6700
ats-scientific.com

ATS SCIENTIFIC INC

For additional information:

AD Systems
P.A. Portes de la Suisse Normande
Allée de Cindais
14320 Saint André sur Orne - France
☎ +33 (0)2 31 75 02 68
Email: sales@adsystems-sa.com
www.adsystems-sa.com

AD systems
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Thermal Oxidation Stability of Aviation Turbine Fuels
ASTM D3241

TO10 –Thermal Oxidation Stability Test Rig

Methods:
ASTM D3241
IP 323, ISO 6249
ASTM D1655, D7566
DEF STAN 91-091

- **State of the art automation level**
- **Dual 5 mL syringe fuel pumping system, perfect fuel flow control, no pulse**
- **Automatic fuel aeration control**
- **Didactic and intuitive man-machine interface**
- **Independent bus bar temperature control, no cooling liquid**
- **DR10 – ITR connectivity for automatic result storage**
- **No operator exposure to fuel vapor with safety door and fume extraction**

For the development of this innovative instrument, all the parameters influencing the accuracy of the D3241 / IP323 test method have been identified. For each of these parameters an innovative and reliable solution has been developed. This very successful apparatus is unmatched in the market.

The preparation of the test is simplified. No tools are needed for assembly and the heating tube mounting.
An extremely intuitive teaching software makes it possible to very quickly initiate a test and if necessary to follow step by step its progress.

Applications

Based on its flexibility, its robustness and reliability, the TO10 is designed for any type of applications, research, and civilian and military fuel certification.

AD systems
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TO10 - Thermal Oxidation Stability Test Rig

State of the art automation level

The ASTM D3241 / IP 323 Thermal Stability test is one of the most important tests for jet fuel quality. This test method was inherently limited due to the subjectivity in the color standard for tube deposit rating.

For quantifying the thermal stability of jet fuels, the advanced interferometry technique developed by AD Systems for the thickness deposit measurement (DR10-ITR) was declared referee in jet fuel specifications ASTM D1655 / D7566 and DEF-STAN 91-091.

This advanced technique highlighted the weaknesses of the existing thermal jet fuel oxidation test rigs. By precisely mapping the thermal oxidation deposit on the surface of the aluminum tube, it became possible to identify issues with existing test rigs that were undetectable with the visual (VTR) rating.

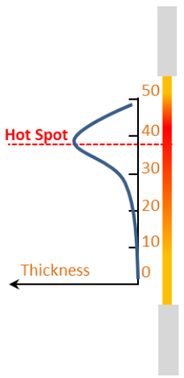
Based on these finding, AD Systems had developed a new jet fuel thermal oxidation test rig (TO10) that ensures perfect fuel preparation, perfect fuel flow control, perfect heater tube temperature profile and perfect thermal deposit quantification when used with tube deposit Rater DR10 - ITR.

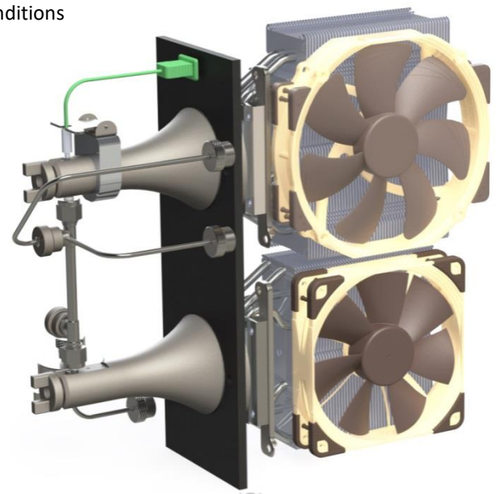
Unparalleled flow and sample volume control:

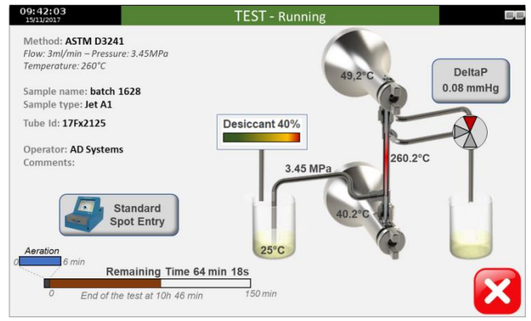
- ✓ Dual 5 mL syringe
- ✓ Automatic priming
- ✓ Ideally stable flow rate, no flow variation unlike an HPLC pump
- ✓ Reduced maintenance, only 60 injections cycles for a full test (150 min.)

Thermal profile of the heater tube perfectly controlled:

- ✓ The temperature of each bus bar is precisely controlled, each with its own independent system
- ✓ Bus bars cooling without liquid circulation
- ✓ Reproducibility improved by perfect control of thermal profiles whatever the ambient conditions

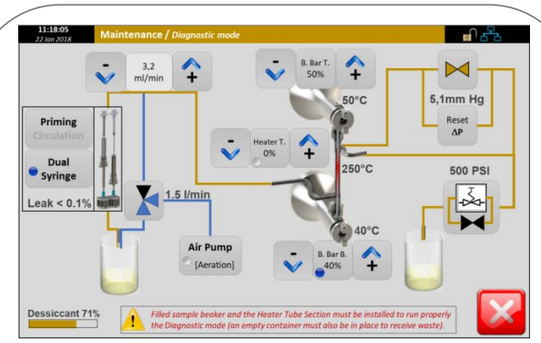






Rapid start:

- ✓ Didactic menus
- ✓ Graphical visualization of the test parameters
- ✓ Highly readable sample information



Simplified maintenance:

- ✓ Graphic screen with complete vision of all sensors and active organs
- ✓ In case of problems the technician can very quickly identify the reason
- ✓ Reduced maintenance training time

Simplified operation:

- ✓ No tools are needed for the installation of the heater tube

Operator safety:

- ✓ Insulated test cell with sliding doors that can be operated with one hand
- ✓ Vapor extraction nozzle that can be connected to a central fume extractor
- ✓ Beaker presence detectors

Automated sample aeration:

- ✓ Automatic control of the air flow during the aeration phase
- ✓ Measurement and display of moisture content