Model 5360/5360A XSD™ Halogen Specific Detector

Description

The Model 5360 and Model 5360A Halogen Specific Detectors (XSD™) were developed for the selective detection of halogen-containing compounds eluting from a gas chromatograph's (GC) capillary column in the subpicogram to microgram range. The XSD installs in the standard detector port of most GC makes and models. It can be installed either as a stand-alone detector or in tandem with the Model 4430 Photoionization Detector (PID).

The 5360A XSD heated base assembly provides improved baseline stability and easy column installation. When used with the enhanced venting option, venting efficiency is nearly 100%, even in the case of a chlorinated solvent injection.

Unlike other halogen selective detectors, the XSD contains no radioactive sources and does not use organic solvents. These XSDs do not require catalyst tubes, solvents, resin cartridges, pumps, or transfer lines. Wipe testing and complicated record keeping are eliminated.

Operating Principle

The reactor is operated in an oxidative mode, pyrolyzing the effluent from a GC column. This oxidative pyrolysis efficiently converts compounds containing halogens to their oxidation products and free halogen atoms.

The cathodic surface is activated by neutralization of alkali ions emitted from the anodic surface. The adsorption and reaction of free chlorine atoms with this alkali-sensitized cathodic surface yields an increased thermionic emission comprised of free electrons and halogen ions.

The total cathodic current is measured by the 5360/5360A electrometer and converted to a 0–1 V or 0–10 V output signal, which can be readily coupled to a chromatographic data handling system.

XSD™ Capabilities

- High halogen selectivity vs. hydrocarbon simplifies analyses and minimizes or eliminates the need for sample preparation
- High detector sensitivity permits very low-level selective analysis of halogen-containing (Cl, Br, F) compounds
- Unique jet design minimizes peak tailing due to unswept dead volumes
- Requires only air to operate
- Designed to operate on most GC makes and models
- No routine maintenance required
- Enhanced venting option diverts solvent before entry to the reactor

Principal Applications

- Halogenated compounds
- VOCs
- Pesticides
- PCBs
- QA/QC testing
- Field GC detector
- Process control/testing
- Residual solvents

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General Specifications

Controller Dimensions	21.2 cm H x 12.8 cm W x 30.8 cm D (8.25″ H x 5.0″ W x 12.0″ D)
Weight	3 kg (5.5 lb)
Controller	3.8 kg (8.4 lbs)
Detector	0.36 kg (0.8 lbs)
Options	Venting Option

Requirements

Gas Requirements	Air 20–30 mL/min (ultrahigh purity)
Power Requirements	90–260 (±10%) V_{AC}, 47–63 Hz, 200 W

Performance Specifications

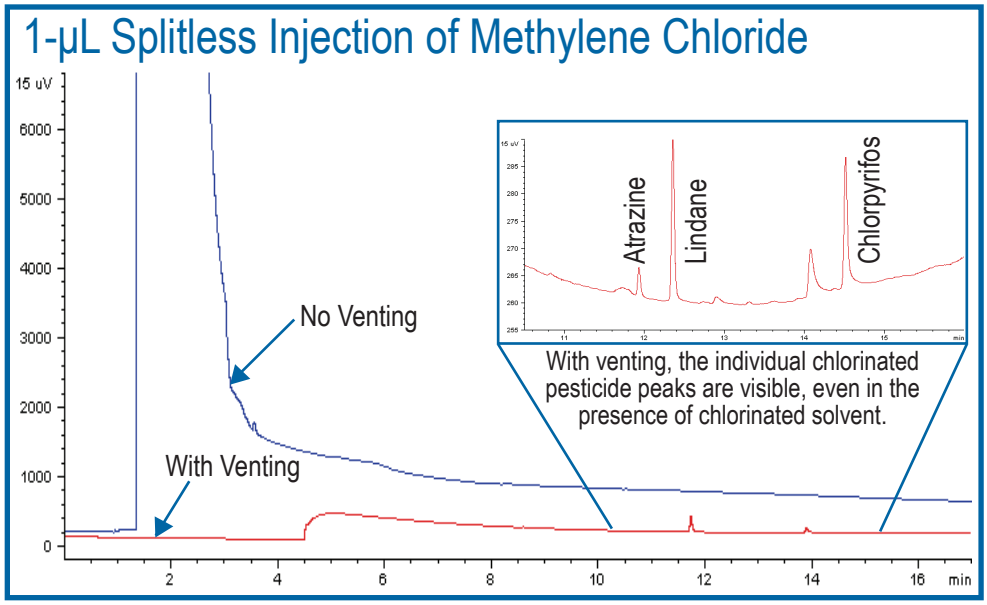
Dynamic Range	$>10^5$
Linear Range	$>10^4$
Detectivity	<1 pg Cl/second
Selectivity	Cl:HC $>10^4$
Reactor Operating Temperature	900–1100 °C in 100 °C increments
Flow Rate	20–30 mL/min air

Communications

Signal Output	0–1 V or 1–10 V

Note

Performance is affected by several factors, including GC, column, gas flow rate, gas supply, compound class, and reactor temperature.



Venting Capability Demonstrated by Complete Venting of a 1-µL Splitless Injection of Methylene Chloride (Pesticide Analysis)

Detector
5360A XSD compared to 5360 XSD

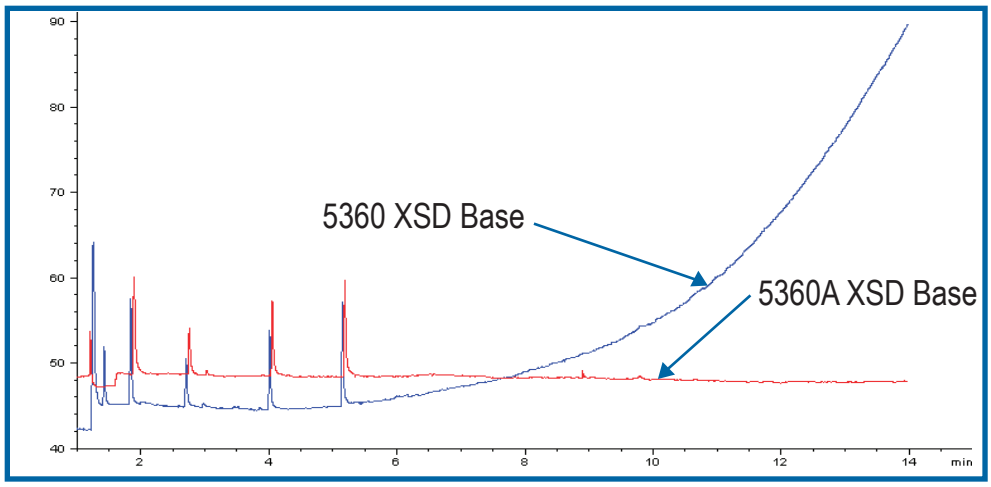
Reactor
1000 °C

Column
Rtx®-5 30 m x 0.32 mm I.D. x 0.25 µm film thickness

Gases
2 mL/min Carrier;
20 mL/min Air

Oven
50 °C for 1 min, 50–250 °C @ 20 °C/min, hold @ 250 °C for 5 min

Sample
1 µL split 10:1



OI Analytical VOC Test Standard Diluted 1:100 in Acetone

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