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NEW ELSD 2000ES

E N H A N C E D S E N S I T I V I T Y

More Sensitive – Lower detection limits

Two Operating Modes – Get optimum performance for all applications

Universal – Detect compounds missed by other detectors

Advanced Features – Increase productivity and decrease downtime

Low Temperature Operation – Detect semi-volatile compounds



The Most Advanced
ELSD
Is Now Even **MORE**
SENSITIVE

Alltech Specialists in Chromatography

Brochure #497

UNP

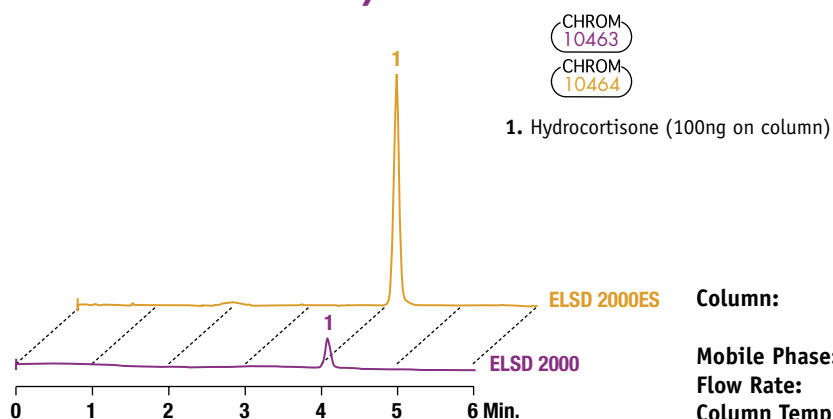
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FROM THE LEADER IN EVAPORATIVE LIGHT SCATTERING DETECTION

The Most Advanced ELSD Is Now Even More Sensitive

The ELSD 2000ES has all the benefits of the ELSD 2000 plus even greater sensitivity! The optical and electronic components have been redesigned to minimize background noise and increase sensitivity. The result of this new, patent pending technology is lower detection limits and greater signal-to-noise ratios.

The ELSD 2000ES Increases Sensitivity for Equal Concentrations of Hydrocortisone



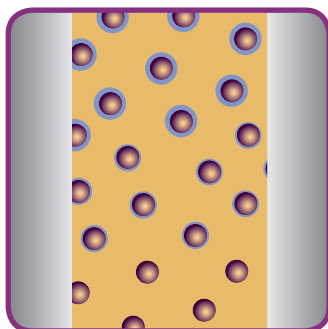
Column: Alltima™ C18, 5µm, 250 x 4.6mm (Part No. **88056**)
Mobile Phase: Water:Acetonitrile (55:45)
Flow Rate: 1.0mL/min
Column Temp: Ambient

Evaporative Light Scattering Detection in Three Simple Steps



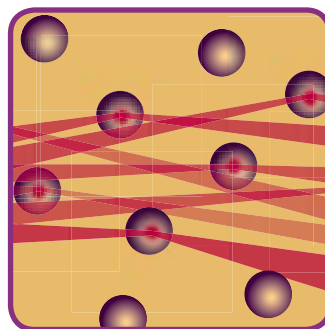
1. Nebulization

Column effluent passes through a needle and mixes with nitrogen gas to form a dispersion of droplets.



2. Evaporation

Droplets pass through a heated 'drift tube' where the mobile phase evaporates, leaving a fine mist of dried sample particles in solvent vapor.



3. Detection

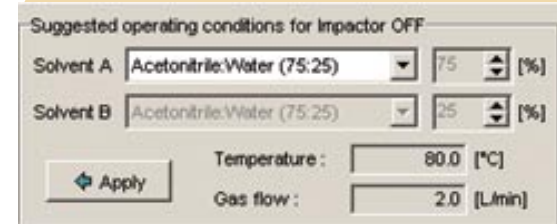
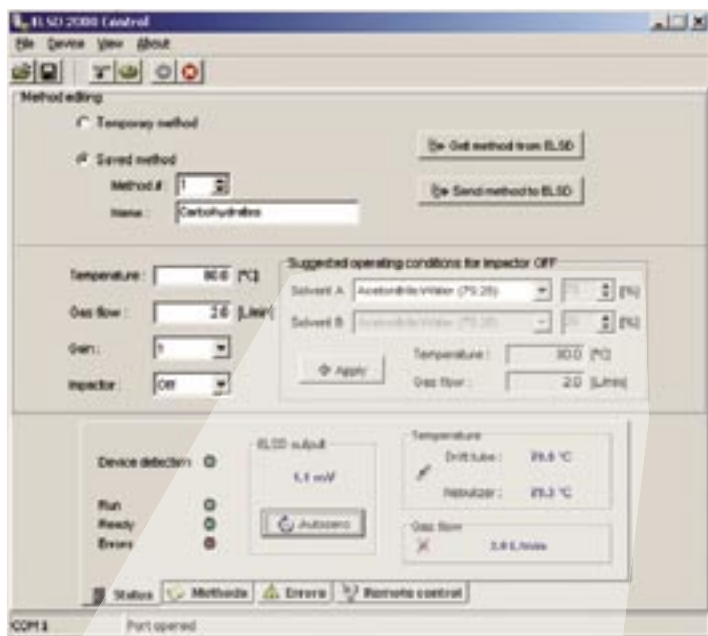
The sample particles pass through a cell and scatter light from a laser beam. The scattered light is detected, generating a signal.

ADVANCED INSTRUMENT CONTROL

The ELSD 2000ES has many features that enhance detector performance, increase productivity, and decrease downtime



Program and view method parameters on the ELSD's menu-driven front panel. Store as many as 10 methods.



Comprehensive PC-based control software makes choosing the critical operating parameters of temperature and gas flow a snap.

Digital Gas Flow Control

Digital gas flow control ensures reproducible results. Changing gas flow is fast and easy from the ELSD's front panel or PC control software. Save gas by automatically shutting off gas flow at the end of an unattended run.

Onboard Diagnostics

Decrease downtime with automated troubleshooting, or use diagnostic tests to verify detector functions on start-up.

Safe, Unattended Operation

Alarm set points ensure tight control of the critical operating parameters. When operating unattended, an output signal can trigger the LC pump to shut down under alarm conditions. Deviations in operating parameters are logged by the type of error at the time it occurs.

ELSD 2000ES* Specifications

Light Source:	Laser diode with collimating optics, 650nm, 30mW output, class IIIB
Detector Element:	Silicon photodiode
Temperature Range:	Ambient to 120°C in 1°C increments
Nebulizer Gas:	Nitrogen preferred; Calibrated to 4.0L/min
Inlet Pressure:	60-80psig
Typical Operating Range:	1.0-3.0L/min
Flow Control:	Digital mass flow control
Mobile Phase Flow Rate:	To 5.0mL/min
Analog Output:	1V or 10mV full scale
Communications:	Inputs: TTL/contact closure for auto zero and gas shutoff Outputs: Contact closure for pump shutdown in error conditions
User Interface:	Graphical LCD with alphanumeric keypad and/or Windows® based PC control via serial I/O
Power Requirements:	120/240V, 50/60Hz
Dimensions:	23.0" H x 12.5" W x 21.6" D (58.4cm H x 31.8cm W x 54.8cm D)
Weight:	35lbs (16Kg)
IEC/FDA Classification:	Class 1 laser product
Warranty:	1 year parts and labor

*Patent pending

OPTIMUM PERFORMANCE WITH ANY APPLICATION

Why Two Operating Modes?

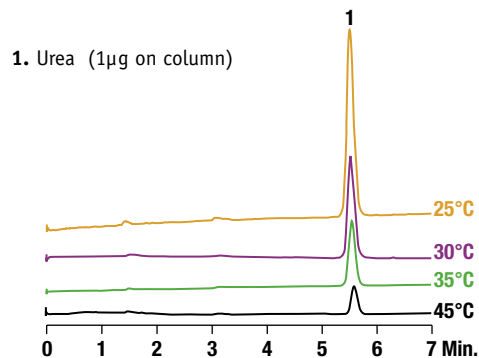
- **Splitting** – Best for semi-volatiles at low temperatures
- **Not Splitting** – Best for non-volatiles at high temperatures

Since an ELSD's response is based on the amount of particles passing through the optical cell, it makes sense that sending 100% of the column effluent would net the highest responses. In most, but not all cases, this is true. Some samples such as semi-volatiles may benefit from lower operating temperatures and gas flows achieved by splitting a portion of the aerosol stream to waste. Only the ELSD 2000ES offers the choice of splitting or not splitting, giving you optimum sensitivity for every application.

Splitting Allows Near Ambient Temperature Evaporation, Maximizing Sensitivity for Semi-Volatiles

Low Temperature Analysis of Urea

CHROM 10307

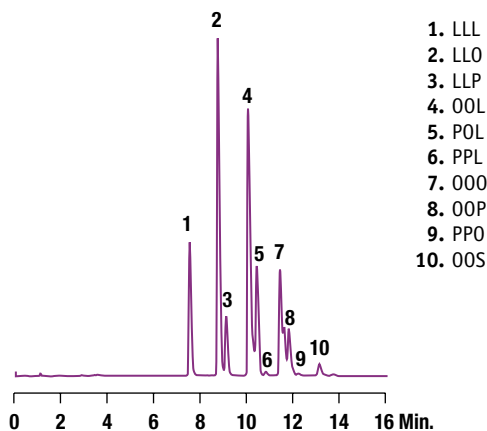


Column: Prevail™ Carbohydrate ES, 5µm, 250 x 4.6mm (Part No. 35101)
Mobile Phase: Acetonitrile:Water (85:15)
Flow Rate: 1.0mL/min
Column Temp: Ambient

Not Splitting is Best for Non-Volatile Samples and/or Organic Mobile Phases

Triglycerides in Sesame Seed Oil

CHROM 9517



1. LLL
2. LLO
3. LLP
4. OOL
5. POL
6. PPL
7. OOO
8. OOP
9. PPO
10. OOS

Column: Alltima™ C18, 3µm, 150 x 4.6mm (Part No. 91387)
Mobile Phase: A: Dichloromethane B: Acetonitrile
Gradient:

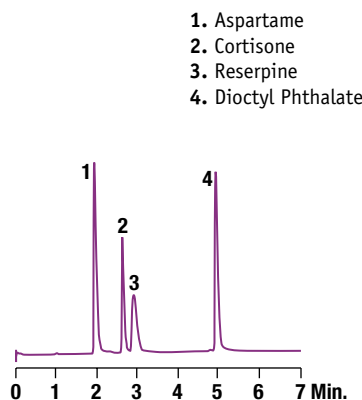
Time:	0	10	18	20
%B:	70	55	70	70

Flow Rate: 1.5mL/min
Column Temp: Ambient

Splitting Maintains Stable Baselines with Rapid, Extreme Gradients

LC/MS Screening Performance Test Mix

CHROM 10273



1. Aspartame
2. Cortisone
3. Reserpine
4. Diocetyl Phthalate

Column: Platinum™ C18, 3µm, 20 x 4.6mm (Part No. 43804)
Mobile Phase: A: 0.05% Formic Acid in Water B: 0.05% Formic Acid in Acetonitrile
Gradient:

Time:	0	3	7	10
%B:	5	90	90	5

Flow Rate: 1.0mL/min
Column Temp: 40°C

E L S D 2 0 0 0 E S

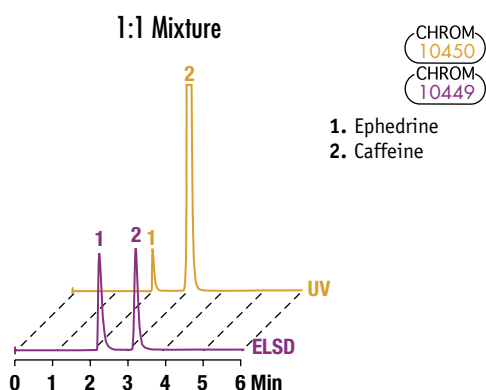
REPLACE OR COMPLEMENT YOUR EXISTING DETECTOR

ELSD Advantages Compared to Other LC Detectors

	ELSD	RI	UV	MS
Sensitivity	●	○	●	●
Gradient Capability	●	○	○	●
Baseline Stability	●	○	○	●
Solvent Interference	●	○	○	●
Mass Balance	●	●	○	○

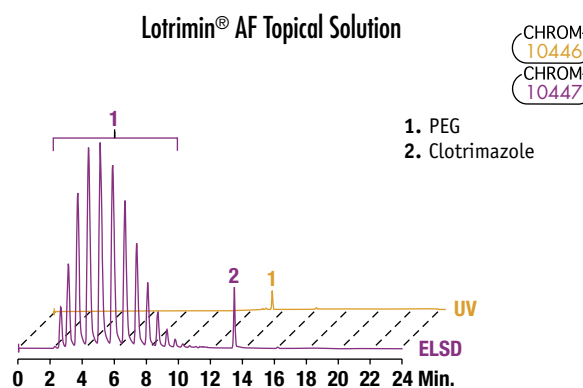
Chart Key	
Excellent:	●
Good:	◐
Poor:	○

ELSD Obtains a More Accurate Representation of Sample Mass than UV



Column: Alltima™ HP EPS C18, 5µm, 150 x 4.6mm (Part No. 87715)
Mobile Phase: 1% Acetic Acid:Methanol:Acetonitrile (70:20:10)
Flow Rate: 1.0mL/min
Column Temp: Ambient

ELSD Shows What May Be Missing From Your UV Chromatogram

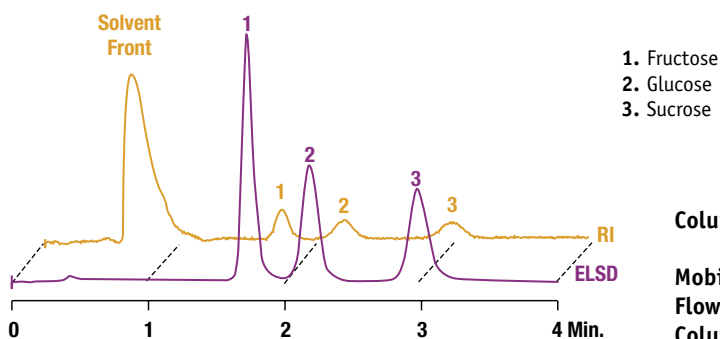


Column: Alltima™ C18, 5µm, 150 x 4.6mm (Part No. 88302)
Mobile Phase: A: Water B: Methanol
Gradient:

Time	0	8	10	20	25
%B	30	50	100	100	30

Flow Rate: 1.0mL/min
Column Temp: 40°C

ELSD Replaces RI with Higher Sensitivity and Stable Baselines



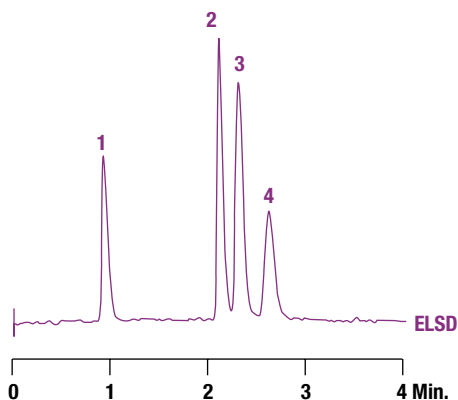
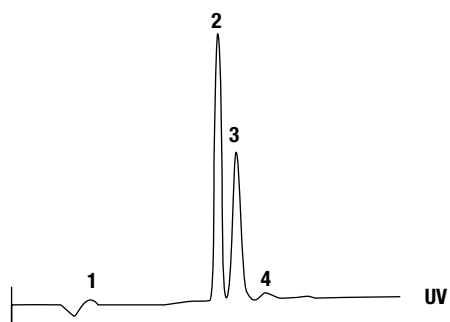
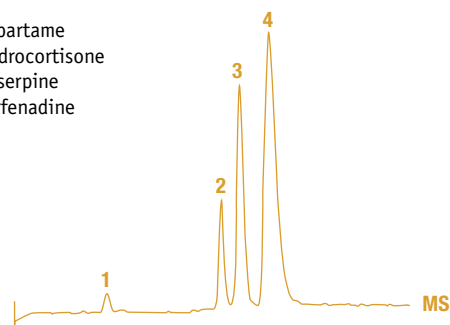
Column: Prevail™ Carbohydrate ES, 5µm, 53 x 7mm Rocket™ (Part No. 35104)
Mobile Phase: Acetonitrile:Water (75:25)
Flow Rate: 2.0mL/min
Column Temp: 30°C

CHROM 10278
 CHROM 10277

IDEAL FOR PHARMACEUTICAL AND NUTRACEUTICAL ANALYSIS

Use ELSD In Parallel with UV/Vis and MS for Maximum Structural and Concentration Information

1. Aspartame
2. Hydrocortisone
3. Reserpine
4. Terfenadine



CHROM-10456
CHROM-10458
CHROM-10457

Column: ZORBAX® StableBond C18, 3.5µm, 50 x 4.6mm (Part No. 835975-902)
Mobile Phase: A: 0.025% Formic Acid in Water
B: 0.025% Formic Acid in Acetonitrile
Gradient:

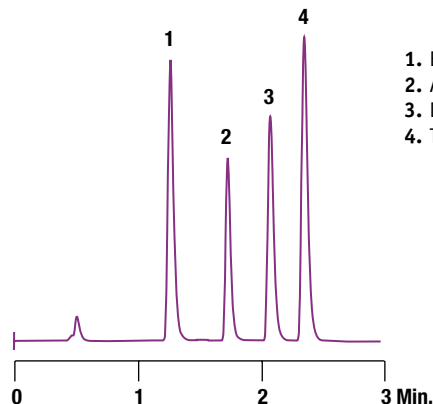
Time:	0.0	1.0	5.0	5.1
%B:	25	70	70	25

Flow Rate: 1.0mL/min
Column Temp: 30°C

Chromatograms courtesy of Agilent Technologies

Stable Baselines with Rapid, Extreme Gradients

1. Ephedrine
2. Acetylsalicylic Acid
3. Diphenhydramine
4. Trimipramine



CHROM-10451

Column: Alltima™ HP C18, 3µm, 33 x 7mm Rocket™ (Part No. 87671)
Mobile Phase: A: 0.1% TFA in Water B: 0.1% TFA in Acetonitrile
Gradient:

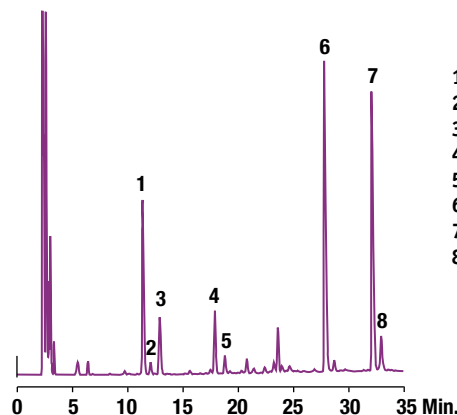
Time:	0	3
%B:	10	90

Flow Rate: 2.5mL/min
Column Temp: 30°C

Use Gradient Elution and Detect Non-Chromophoric Nutraceuticals

Ginkgo Biloba Standardized Extract

1. Bilobalide
2. Ginkgolide J
3. Ginkgolide C
4. Ginkgolide A
5. Ginkgolide B
6. Quercetin
7. Kaempferol
8. Isorhamnetin



CHROM-10241

Column: Alltima™ C18, 5µm, 250 x 4.6mm (Part No. 88056)
Mobile Phase: A: 0.05% TFA in Water:Methanol (95:5)
B: 0.05% TFA in Methanol
Gradient:

Time:	0	35
%B:	25	75

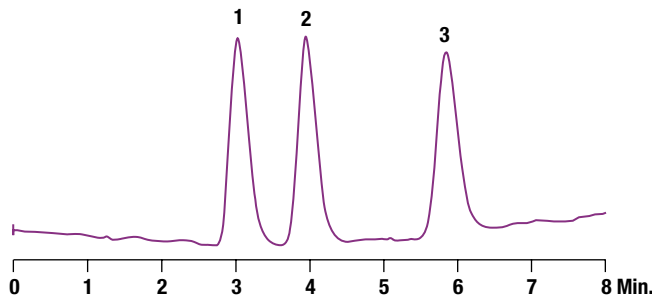
Flow Rate: 1.0mL/min
Column Temp: Ambient

VERSATILE DETECTION FOR A BROAD RANGE OF APPLICATIONS

Use ELSD with Microbore Columns without Modifying the Detector

Glucopyranosides

CHROM 10310



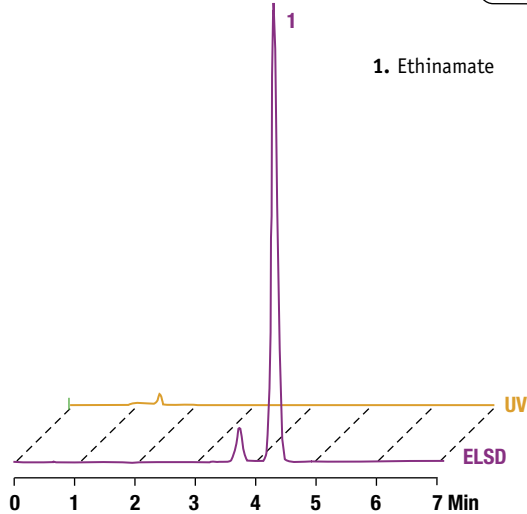
1. n-Octyl Glucopyranoside (50ng on column)
2. n-Decyl Glucopyranoside (50ng on column)
3. n-Dodecyl Glucopyranoside (50ng on column)

Column: Alltima™ C18, 3µm, 150 x 1mm (Part No. 43864)
Mobile Phase: Methanol:Water (90:10)
Flow Rate: 50µL/min
Column Temp: Ambient

Use ELSD for Triggering Fraction Collection of UV/Vis Transparent Compounds in Preparative Applications

Ethinamate

CHROM 10438



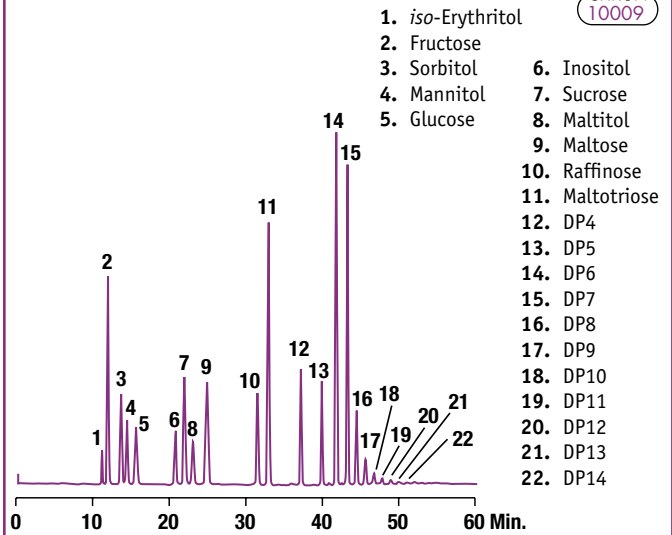
1. Ethinamate

Column: Alltima™ C18, 5µm, 150 x 10mm (Part No. 81102)
Mobile Phase: Water:Acetonitrile (55:45)
Flow Rate: 5.0mL/min
Column Temp: 25°C

ELSD Simplifies Detection of Difficult Samples

Mono-, Di-, Tri-Saccharides

CHROM 10009



1. iso-Erythritol
2. Fructose
3. Sorbitol
4. Mannitol
5. Glucose
6. Inositol
7. Sucrose
8. Maltitol
9. Maltose
10. Raffinose
11. Maltotriose
12. DP4
13. DP5
14. DP6
15. DP7
16. DP8
17. DP9
18. DP10
19. DP11
20. DP12
21. DP13
22. DP14

Column: Prevail™ Carbohydrate ES, 5µm, 250 x 4.6mm (Part No. 35101)
Mobile Phase: A: Acetonitrile
 B: 0.04% Ammonium Hydroxide in Water
Gradient:

Time:	0	25	40	60
%B:	17	27	45	55

Flow Rate: 1.0mL/min
Column Temp: Ambient

PRODUCT DETAILS AND SERVICES



The ELSD 2000ES has been designed and manufactured in accordance with the following standards: EN6101-1 + A2:95, EN555011: 1998, FCC CFR 47 Part 15: 2001, EN 61326: 1998, EN 6100-3-2: 1995 + A14:2000 and EN61000-3-3: 1995

ELSD 2000ES*	
DESCRIPTION	PART No.
120V	600100ES
240V	600200ES

* Patent Pending

Full IQ/OQ/PQ Protocols Included With Each ELSD

Alltech makes it easy for you to integrate the ELSD into a qualified HPLC system. The ELSD 2000ES is thoroughly tested before shipment and calibration and performance documents are included with each instrument. Detailed IQ/OQ/PQ procedures are included with the detector to help you perform your own qualification. We also provide the option of onsite qualification performed by an Alltech service engineer.

Instrument Services	
DESCRIPTION	PART No.
Qualification Services	
IQ/OQ performed by Alltech	Q60010ES
PQ performed by Alltech	Q60020ES
IQ/OQ/PQ performed by Alltech	Q60030ES
Re-OQ performed by Alltech	Q60040ES
Re-OQ/PQ performed by Alltech	Q60050ES
Installation and Training	
Installation and familiarization	INSTALL



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