The ELSD Innovators

Delivering the best ELSD Universal Detection

SOFTA

Feature Rich Detectors for Every Laboratory and Application

Delivering the Best ELSD Universal Detection

SofTA Evaporative Light Scattering Detectors (ELS detectors) are high performance instruments used for liquid chromatography concentration detection. ELS detectors are an ideal alternative to refractive index and low wavelength UV detectors for analytes with no UV chromophore. Common application areas include pharmaceuticals, nutraceuticals, combinatorial libraries, carbohydrates, lipids, phospholipids, triglycerides, fatty acids, amino acids, polymers, and surfactants.

Model 200S

Model 100

INTRODUCING
Model 2300
High Sample Throughput.
Sleek Modern Design.

Model 300S

Model 1300

SofTA Advantages

- Outstanding semi-volatile detection at ambient temperatures with patented Thermo-Split™ Technology and dual gas option.
- Outstanding baseline stability and response with extreme gradients without gas flow control.
- Very low effective detector volume resulting in the narrowest peak widths of any ELS detector to match the speed requirements of today's fast LC.
- Patented Thermo-Split Vapor Phase Control for optimum sensitivity.
- Reproducible droplet distributions, assured by thermally isolating the nebulizer from the spray chamber and drift tube, improving reproducibility between methods.
- Very low detection limits, as low as 10ng with conventional HPLC flow rates and columns. Lower detection limits can be achieved with µl/min flows and narrow columns.
- Extended dynamic range, up to 0.25mg or 3+ orders of magnitude.
- Outstanding reproducibility, ~2%RSD.
- Low evaporation temperatures with high flow rates: 3mL/min water at 10°C SC/40°C DT.
- Bench-saving footprints: 7.5" wide vertical or 6.5" high horizontal designs fit into existing systems for a safer, cleaner work environment.

APPLICATION AREAS INCLUDE:

PHARMACEUTICALS
NUTRACEUTICALS
COMBINATORIAL LIBRARIES
CARBOHYDRATES
LIPIDS
PHOSPHOLIPIDS
TRIGLYCERIDES
FATTY ACIDS
AMINO ACIDS
POLYMERS
SURFACTANTS

Advantages Over UV and RI Detectors

- Detects everything in your sample independent of a compound's absorbance, fluorescence, or electroactivity.
- Responds universally to a wide variety of analytes to accurately compare the actual component ratios.
- Is compatible with most solvents and fast gradients for better separations.
- Accurately quantifies without pre- or post-column derivitization—saving time and money.
- Detects to low nanogram levels and excellent responses for all non-volatile compounds.

East To Use, Saves Money

- Fast start-up, no consumable parts, and low-cost operation.
- Easy-to-use interfaces, automated system diagnostics, and context-sensitive help features. With the push of one button the user receives detailed instructions, providing increased productivity with less training.
- Long-life lasers with a continually monitored output for stable detection without costly lamp replacements.
- Clog-free 100% Teflon nebulizer optimized for flowrates from 0.2mL/min to 5mL/min. One nebulizer for all applications saves time and money.
- Gas flow optimization not required. Low gas pressure and flow requirements allow use of cylinder, house systems, or gas generators. The pneumatic system is protected by a high-pressure shut-off and provides a signal in the event of unstable or insufficient pressure.
- Designed for unattended operation. If the detector encounters a deviation from one of the predefined set points, an audible signal accompanies an electronic signal that can be used to stop the mobile phase and auto sampler.
- Lowest purchase price in the industry. SofTA's state-of-the-art technology provides ELS detectors with the best performance at the lowest cost.

SofTA ELS Detectors: An ideal substitute, or suppliment to, traditional HLPC detectors for liquid chromatography concentration detection

How an ELS Detector Works

An ELS detector employs a unique method of detection. The process involves three steps: nebulization, evaporation, and detection.

Nebulization

In the first step, the SofTA ELS detector transforms the liquid phase leaving the column into an aerosol cloud of fine droplets. The size and uniformity of the droplets are extremely important in achieving sensitivity and reproducibility. SofTA ELS detectors use a concentric gas nebulizer, a constant flow of an inert gas, and independent nebulizer zone (spray chamber) temperature control to achieve the required consistency.

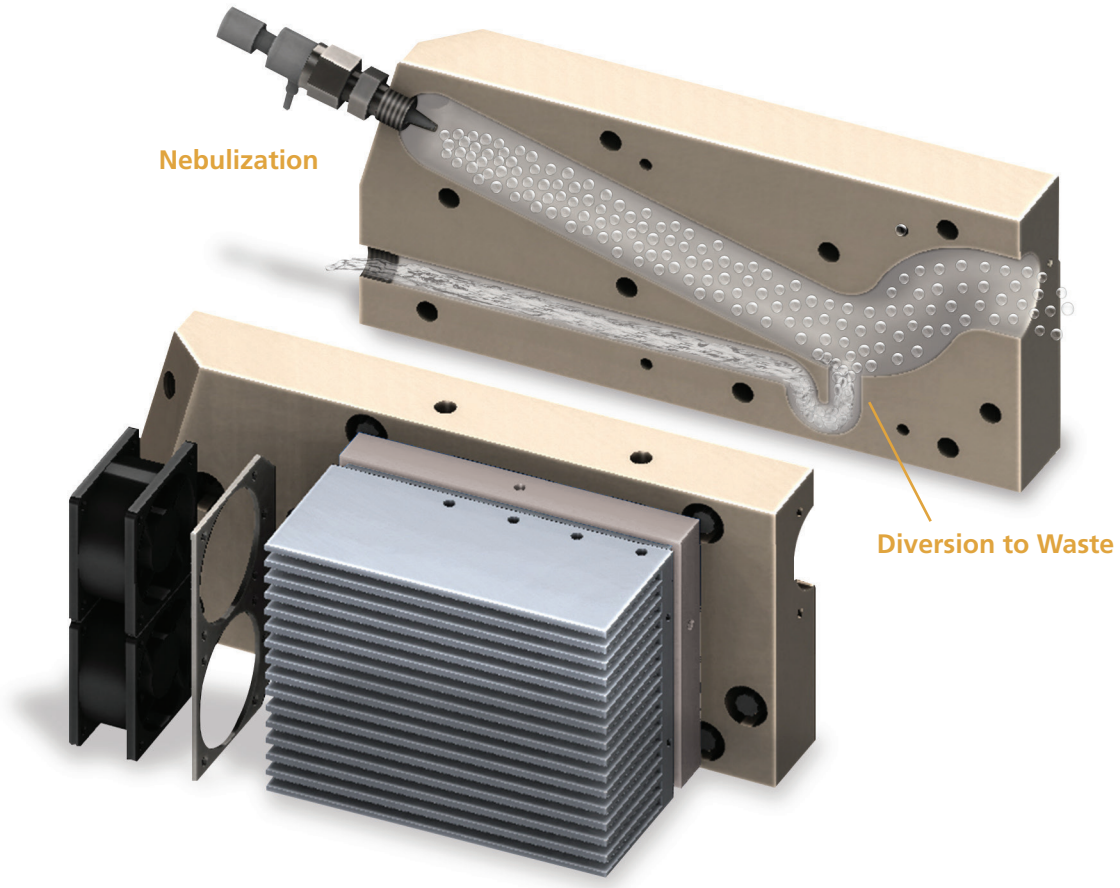
Evaporation

The aerosol cloud is propelled through the temperature-controlled evaporation tube assisted by the carrier gas. In the evaporation tube, the solvent is volatilized to produce particles or droplets of pure analyte. The temperature of the drift tube is set at the temperature required to evaporate the solvent. The design of the SofTA drift tube provides evaporation of solvents at low temperatures to minimize the evaporation of the compound of interest and increase sensitivity.

The total swept volume of the detector is critical to maintain narrow peak widths, especially important for work with small column volumes. The SofTA ELS detectors feature extremely low swept volume and minimum peak dispersion The total swept volume of the detector is critical to maintain narrow peak widths, especially important for work with small column volumes.

Detection

The particles emerging from the evaporation tube enter the optical cell, where the sample particles pass through a beam of light. The particles scatter the light. A light trap is located opposite the laser to collect the light not scattered by particles. The amount of light detected is proportional to the analyte concentration and solute particle size distribution. SofTA ELS detectors guarantee years of stable detection by employing a laser diode light source instead of a short-lived halogen lamp. This eye-safe laser, when combined with our high gain and wide range photo-diode detector, provides at least 3 orders of magnitude detection without changing gain or range.



SofTA's Unique Technology

Exclusive Thermo-Split™ Technology: HIGHEST SENSITIVITY - ULTIMATE CONTROL

All SofTA ELS detectors use Thermo-Split Technology to provide full control of the ratio of mobile phase to analyte particles. This ratio can be optimized for increased sensitivity and varying flow rates or mobile phase gradients. This means that with one low-cost detector you can handle high volume as well as semi-volatile and non-volatile analytes and difficult-to-evaporate mobile phases optimally, efficiently, and easily, all without sacrificing sensitivity.

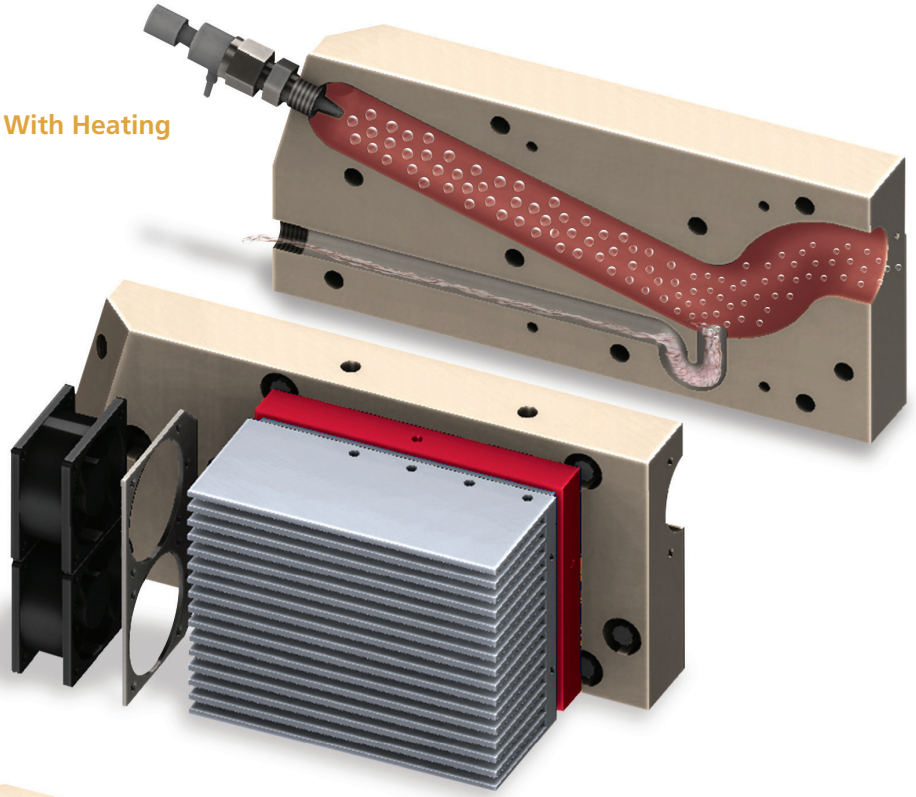
All ELS detectors divert part of the aerosol cloud to accommodate high flow rates and mobile phases common in HPLC. SofTA's patented (Patent No. US 7,290,723 B1) Thermo-Split Technology has the ability to vary the split ratio smoothly over a wide range. This precise vapor phase control combines a gentle bend with a temperature-controlled spray chamber.

For easy-to-evaporate mobile phases, the Spray Chamber walls are heated. As the aerosol traverses the chamber, it partially evaporates, shifting the particle size distribution low enough for essentially all the particles to negotiate the bend.

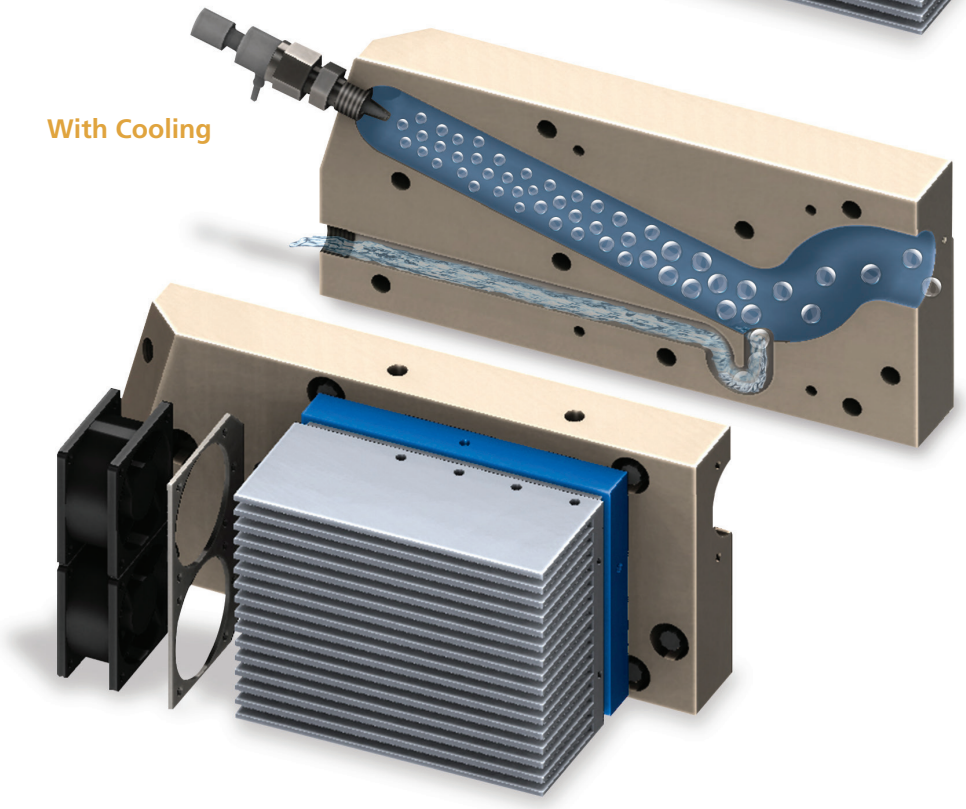
For difficult-to-evaporate mobile phases, or high flow rates, the walls are cooled. When the aerosol exiting the nebulizer encounters a cooled environment, it partially condenses into larger particles whose momentum carries them into the wall and down the drain. By making the walls cold, a portion of the vapor phase is diverted away from the evaporative zone.

The ultimate benefit of Thermo-Split Technology is that it can be controlled in a smooth analog fashion by simply controlling a temperature. The temperature of the nebulization zone can be set from 10°C to 60°C, in 1°C increments. This achieves split ratios of approximately 99% to 1%. Unlike some ELS detectors, our splitter isn't always on. Instead, it can be on, off, or anything in between. **This patented technology was invented by SofTA Corporation and is exclusive to our products.**

With Heating



With Cooling



SofTA's ELS Detectors

SofTA Corporation offers five ELS detector models; one is perfect for your laboratory whether it is a high throughput, advanced research, quality control, or educational lab. Regardless of the model you choose, you'll get the most advanced, easiest to use ELS detector.

Model 300S

Model 2300

Model 1300

High Throughput, High Sensitivity Systems

SofTA 300 Series detectors, Models 300S, 1300, and 2300, are ideal for any advanced research laboratory requiring high sensitivity, high flow rates, or analysis of semi-volatile compounds.

They provide both heating and sub-ambient cooling of the Thermo-Split chamber for superior ELS detection. Two filter algorithms allow for adapting the instrument to either conventional or fast liquid chromatography. With 3+ orders of magnitude dynamic range, these detectors allow a user to quantify an analyte and still see an impurity. Because these detectors are oriented toward a research environment where a wide variety of analytical methods may exist, they can store and recall 10 different instrument profiles.

Profiles (methods) can be created to optimize for commonly encountered HPLC conditions and analytes, then reloaded with a few keystrokes. During start-up, the ELS detector performs an extensive series of diagnostic checks, ensuring instrument functionality. And unlike ELS detectors from other manufacturers, internal temperatures are controlled from the nebulizer all the way to the exhaust tube. As a result, fluctuations in laboratory temperature during the course of a day, or from season to season, have negligible effect.

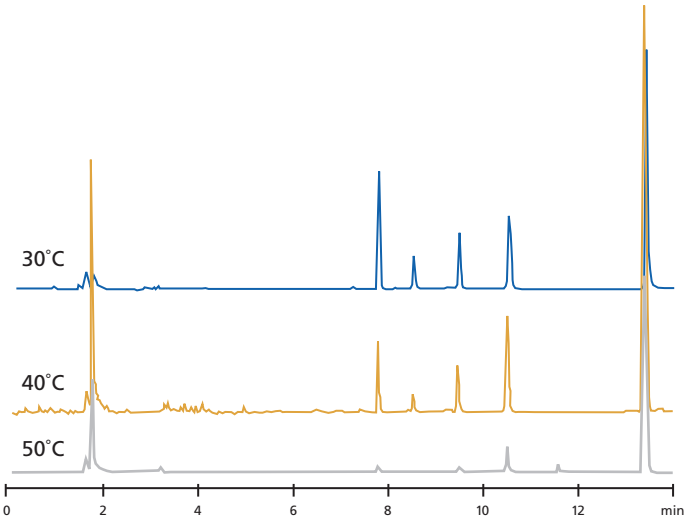
Models 1300 and **2300** are designed for use with Rapid Resolution and Ultra Performance LC Systems. They maintain the peak widths obtained with these systems. These are our fastest ELS detectors, with peak widths less than 1 second. The narrow peak widths provide for the extremely high sample throughput required in today's laboratories. Narrow peaks also result in improved signal to noise, making these detectors about two times more sensitive than our other models.

These detectors also feature dual gas operation. Low-cost nitrogen is used as the nebulization and carrier gas for non-volatile and high to moderately low concentrations of semi-volatile analytes. Substituting helium provides maximum low-nanogram sensitivity for compounds with significant volatility by allowing ambient evaporation of the mobile phase.

Detection of semi-volatile analytes

When an analyte is non-volatile, drift tube temperatures of 60 to 100°C can be used to ensure total evaporation of aqueous mobile phases, providing the very best sensitivity. However, when compounds have higher volatility these drift tube temperatures will volatilize the analyte along with the mobile phase resulting in low sensitivity or even no detection.

Sub ambient operation of the SofTA Thermo-split chamber allows for near ambient drift tube temperatures. The example below illustrated the detection of the low molecular weight parabens with an ordinary 1ml/min gradient. Reduction of the drift tube temperature from 50°C to 40°C results in excellent sensitivity for the smallest paraben, methyl. Switching from nitrogen to helium as the nebulizing and sweep gas allows an even lower drift tube temperature of 30°C and provides even better sensitivity for methyl paraben.



Column: C18 5µ 150mm x 4.6mm
Mobile Phase: A: Water B: MeOH5 to 70% B in 5 min, 70 t0 95 in 12min, 1ml/min
ELSD: SC 10°C, DT 30°C, 40°C, 50°C
Peaks
Methyl Paraben
Ethyl Paraben
Propyl Paraben
Butyl Paraben
Heptyl Paraben

Model 300S

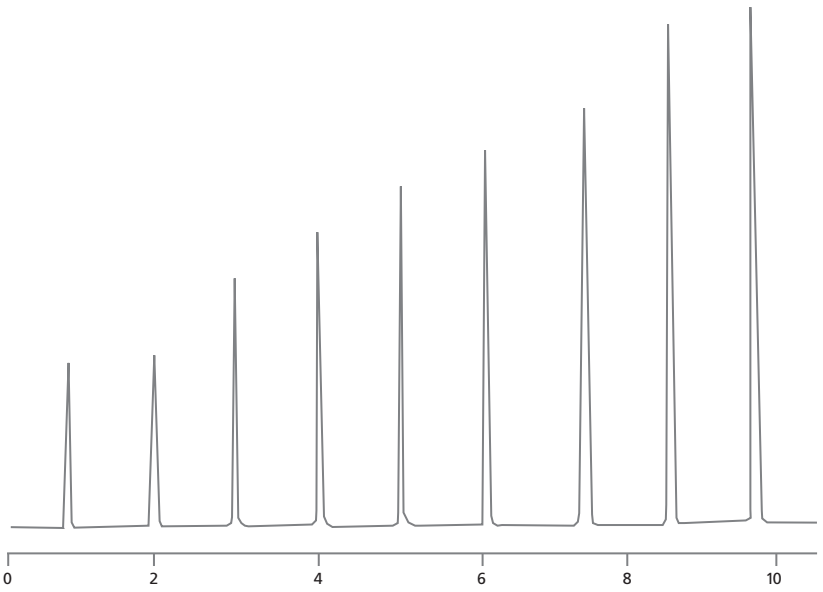
The Model 300S features an easy to use and learn four-button interface, as well as an informative dual zone display. Instrument output is always displayed, along with one other user-selected instrument parameter. Changing the secondary parameter is as easy as using the up and down arrows on the keypad. Priced at thousands less than the competition, the Model 300S is a great choice for demanding users.

Model 1300

The Model 1300 has been designed with physical dimensions to fit within almost all manufacturers' LC systems. The ELS detector is placed in the instrument stack to conserve bench space and reduce the tubing length between the autosampler, or UV, and the ELS detector. The drop-down front and pull-out tray allows the detector to be serviced in place. No need to dismantle the entire system. The detector is controlled from touch-sensitive keys behind the front panel and the dual zone display, or via the SofTA PC-based control application.

Model 2300

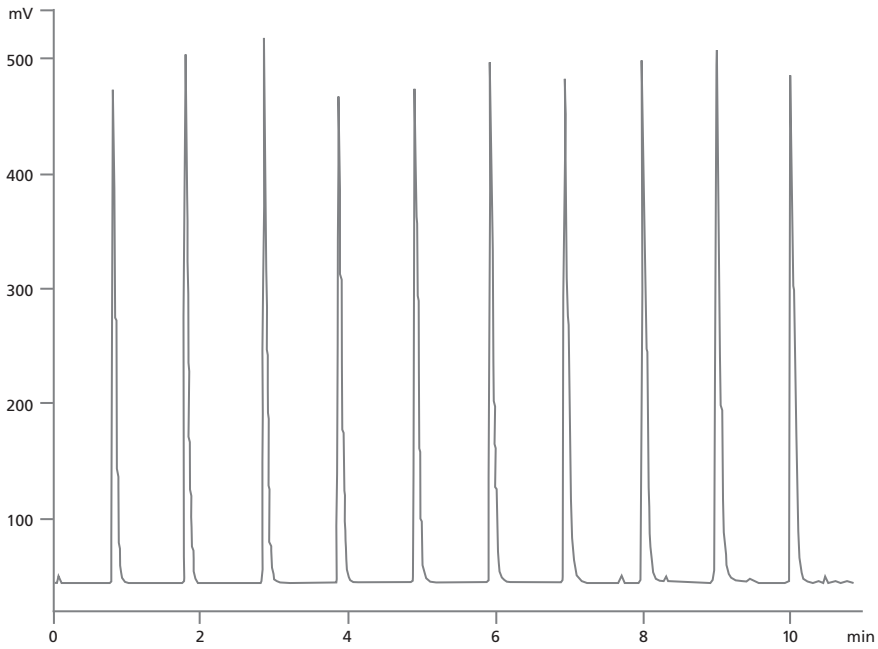
The Model 2300 is designed to be placed beside the system. It can be configured to sit to the left or the right of the system. The narrow width of the detector, 6.5", preserves valuable bench space. The attractive design of the detector is practical and durable. The hard anodized finish and laser marked labeling are solvent- and wear-resistant. The detector is controlled via the unique touch panel on the molded front or via the SofTA PC-based control application.



Typical ELSD Gradient Response

Gradient

SofTA ELS detectors, due to the unique nebulizer and spray chamber design, are independent of the viscosity of the mobile phase and provide a constant response across a gradient. Other ELS detectors have a response that can vary by a factor of 10 over a gradient can due to these solvent effects.



SofTA ELSD Gradient Response

Mobile Phase: A: Water B: MeOH90/10 to 10/90 in 11 min
ELSD: SC 30°C, DT 60°C
Sodium Benzoate

Quality Control and Educational Laboratories

These detectors meet the requirements of laboratories looking to add ELS detection technology for repetitive analysis or higher concentration samples.

Model 200S

The Model 200S accommodates common HPLC mobile phases and flow rates by controlling the Thermo-Split chamber and evaporation zone temperatures at ambient or higher.

Model 100

The Model 100, our lowest cost ELS detector, has been designed to replace conventional HPLC detectors in most laboratories. The Model 100 can easily accommodate common HPLC conditions using the preprogrammed primary method.

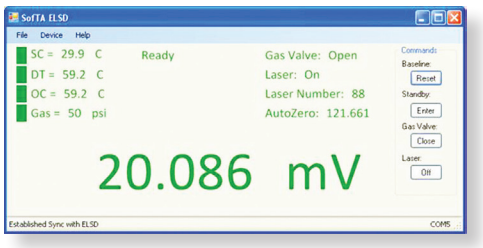
Model 200S

Model 100

SofTA ELS Detectors PC-based Control Application

SofTA ELS detectors feature both digital and analog signal outputs.

Drivers for some popular Chromatography Data Systems (CDS) are available to provide control and data collection from SofTA ELS detectors. For other systems, the detector signal can be collected and imported via an A to D device. The SofTA control application can be installed on the system PC to provide control of all the detector parameters and store and recall user-defined methods.



Specifications

	2300	1300	300S	200S	100
Dimensions	7.5" w x 15" d x 12" h	13.8"w x 17.2"d x 6.3"h	9.8"w x 18"d, 11.5"h		
Weight	21 lbs	46 lbs	23 lbs		
Display	2 line x 20 character per line VFD				
User Interface	Touch- sensitive keys		Four multi-function buttons	Two multi-function buttons	
Evaporative Zone Temperature	Ambient to 120°C				60°C
Thermo-Split™Spray Chamber Temperature	10°C to 60°C			30°C to 60°C	30°C
Liquid Flow Rate	0.2mL/min to 5mL/min			0.2mL/min to 3mL/min	
Gas Requirements	65 psi nitrogen or other inert gas				
Gas Consumption	~3 SLPM		~ 2.5 SLPM		
Gain Settings	Normal, low		Normal, low	Normal	
Operating Conditions	Intended for indoor use only, 60°F to 85°F and <90% R.H. non condensing				
Electrical Requirements	Nominal 120 VAC, 50/60 Hz or nominal 240 VAC, 50/60 Hz; 600 watts				
Wetted Materials	Stainless steel, glass (lenses only), anodized aluminum, Teflon™				
Light Source	650 nm laser diode, <5mW				
Detector	Hermetically sealed photo-diode/operational amplifier				
Output Signal	0 -1 VDC		0 - 5 VDC		
Interface	RS232, contact closure, software driver (DataApex Clarity)				

Part. No	Description
5-002300-R-120	Model 2300 ELSD, right side liquid inlet and drain outlet, 120V
5-002300-R-240	Model 2300 ELSD, right side liquid inlet and drain outlet, 240V
5-002300-L-120	Model 2300 ELSD, left side liquid inlet and drain outlet, 120V
5-002300-L-240	Model 2300 ELSD, left side liquid inlet and drain outlet, 240V
5-001300-120	Model 1300 ELSD, 120V
5-001300-240	Model 1300 ELSD, 240V
5-000300-120	Model 300S ELSD, 120V
5-000300-240	Model 300S ELSD, 240V
5-000200-120	Model 200S ELSD, 120V
5-000200-240	Model 200S ELSD, 240V

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