

# Escort® ELF Sampling Pump

## Feature

- Patented electronic laminar flow control.
- Internal secondary standard calibrates the pump continuously for compliance with OSHA 3058.
- Check against a primary standard only once a month or every 200 hours for coal mine dust sampling.
- Inlet filter traps moisture and particulate matter.
- Stainless steel-filled plastic case provides EMI/RFI protection.
- Rated IP66 for resistance to water and dust ingress.
- Exceptionally quiet operation.
- Flow-Fault Indicator shows any sample inlet blockage.
- Run/Hold feature allows “time out” during sampling process.
- Elapsed time readout and low-battery warning.
- Low flow and dual tube sampling available with Gemini Twin-Port Sampler



## Approvals

Escort ELF Sampling Pumps are UL approved as intrinsically safe for use in hazardous locations – Class I, Groups A, B, C, D; Class II, Groups E, F, and G; and Class III, Division I locations. NIOSH certified for coal mine dust sampling (TC-74-030). MSHA certified as intrinsically safe for underground use (Approval No. 2G-3924-1). ATEX approved LOM 11ATEX2041 (select models). Pennsylvania DEP #BFE 6-11.

## Competitive Advantages

- Patented “Laminar Flow” control permits the best accuracy in the business
- Requires calibration only once per month or once every 200 hours for MSHA applications.
- “Key Pad” design allows adjustment of flow rates without tools or a potentiometer.
- Lightweight – only 23 ounces.
- Very durable design.
- Extremely easy to use.
- Resolution display is .1 lpm in standard mode, .01 lpm in calibration mode.
- 3 gaskets provide superior protection against water and dust ingress.
- Tamper-resistant door restricts access to adjustment keys.
- Designed for use with many different sampling accessories.

## Escort ELF Specifications

Operating Flow Control	Volumetric flow rate held within $\pm 2.5\%$ of set-point over the 1-to-3 lpm operating range ( $\pm 5\%$ to 0.5 lpm), with automatic compensation for battery voltage, altitude, temperature and sample load changes.
Flow Rate	Flow rate adjustable between 0.5 and 3 lpm; lower flow rates attainable (to 1 mlpm) with optional Gemini Twin-Port Sampling accessory.
Flow Indication	Liquid Crystal Display provides 0.01 lpm resolution.
Operating Range	30 inches of water load up to 2 lpm and 10 inches up to 3 lpm.
Flow Blockage Detection	Flow-Fault LED comes on immediately when block is detected. Pump shuts down within 90 seconds if block is not cleared.
Elapsed Time Readout	To 999 minutes in increments of 1 minute. Holds the last reading after either flow blockage or low battery shut-down and when pump is off or in hold mode.
Operating Time	Varies with flow rate and sampling device loading.
Operating Temperature Limits	32°-113°F (0°-45°C)
Physical Weight	23 oz. (652 gm), with battery pack.
Dimensions	2.25" D x 4.25" H x 4" W (5.7 cm x 10.8 cm x 10.2 cm), with battery pack.
Power Supply	4.8-volt battery pack of four nickel metal hydride cells.
Battery Pack Capacity	2.8 amp hours
Battery Pack Recharge Time	14-16 hours (overnight) with Omega™ Charger.
Typical Battery Pack Life	300 or more charging cycles



## CALIBRATION DEVICES

The calibration of a sampling pump is critical to the quality of samples taken. Calibration determines that the flow rate of air through the pump is accurate, within specified limits, usually  $\pm 5\%$ . A primary calibration device, the DigiCal™ Calibrator provides instantaneous calibration for instruments like the Zefon Escort LC Pump or the secondary flow standard inside the Escort ELF Sampling Pumps.

Just press the plunger and the Digi-Cal Calibrator does the work. Its unique flow cell replaces conventional bubble tubes and makes calibration easier. The DigiCal Calibrator achieves extreme accuracy by utilizing a computerized flow meter that provides instantaneous flow readouts on a digital display. Accurate measurements are possible within  $\pm 0.5\%$  at any altitude.

### Single Pump Kits

Part Number	Description
805558	Escort ELF Pump with sampling line. No charger.
805559	Escort ELF Pump with 120v charger, Gemini® Twin Port Sampler.
805560	Escort ELF Pump with 120v charger and sampling line.
P1-ELF1-2-1-0-E	Escort ELF Pump with 230v charger and sampling line, ATEX
P1-ELF1-2-3-0-E	Escort ELF Pump with 230v charger, Gemini® Twin Port Sampler, ATEX

### 5-Pack Pump Kits

Part Number	Description
805563	Escort ELF Pump with 5 station 120/240v, 50/60Hz charger and sampling line.
711396	Escort ELF Pump with 5 station 120/240v, 50/50Hz charger and Gemini® Twin Port Sampler

### Sorbent Tube Sampling

Part Number	Description
497697	Gemini® Twin Port Sampling Kit -- includes: Gemini Sampler, tube protectors, Y-connectors, clips and carrying case.
ZST-001	Charcoal Sampling Tubes (50/100mg), 6 x 70mm, 50 tubes

### Cassette Sampling

Part Number	Description
803462	Coal Dust Filter Cassette: Prewighed filter cassette with 5- $\mu$ pore size PVC filter and Mine Data Card - Coal Dust - MSHA mandated sampling.
711361	Coal Dust and/or Silica Filter Cassette: Prewighed filter cassette with 5- $\mu$ pore size PVC filter non regulated use, General Purpose.

### Cyclones

Part Number	Description
456243	Respirable Dust Sampling Cyclone Assembly for Coal Dust Cassettes
10044015	Respirable Dust Sampling Cyclone Assembly for 37mm IH Cassettes

### Calibration

Part Number	Description
655101	RDigital-5 Primary Flow Calibrator

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## Gemini® Twin-Port Sampler

For low-flow control when sorbent tubes are used, the patented Gemini Twin-Port Sampler is a valved mechanism that allows flow adjustment down to 1 mlpm (0.001 lpm to 600 mlpm total between both tubes). U.S. Patent No. 5,370,004. As an added benefit, the Gemini accessory permits simultaneous sampling from sorbent tubes, with independently controlled flow rates of each. Dual sampling means two like sorbent tubes can be attached for simultaneous sampling at different flow rates, or two different tubes can be used to sample two types of substances at once.