

# Ettan DALTSix Large Vertical Electrophoresis System

for second dimension 2-D electrophoresis

## Ettan DALTSix Electrophoresis System for large format and medium throughput 2-D electrophoresis

- Runs up to 6 gels 26 cm wide by 20 cm long each with 18- or 24 cm long Immobiline™ DryStrip gels
- Accommodates lab-cast and pre-cast gels
- Simple-to-use 1.0 mm or 1.5 mm pre-assembled hinged gel cassettes
- Innovative anode assembly/cassette carrier and upper buffer chamber simplify loading and unloading
- Built-in ceramic heat exchanger and buffer circulation pump ensure efficient cooling
- Durable, reliable and flexible

The Ettan™ DALTSix Electrophoresis Unit runs up to six large format (26 × 20 cm) second dimension acrylamide gels in just 4–5 hours. The gels accept the first dimension 18- or 24 cm Immobiline DryStrip gels (IPG strips) from both IPGphor™- and Multiphor™ II isoelectric focusing systems.

True to its heritage, Ettan DALTSix uses the same convenient pre-assembled gel cassette designs, with hinged plates and permanent spacers, as the original Amersham Biosciences™ DALT and Ettan DALTwelve (DALT II) Systems. For lab casting choose a 1.0-mm or 1.5-mm gel casting cassette and high quality PlusOne gel casting chemicals. For precast gels on support film, choose the Ettan DALT Gel 12.5 1.0 mm precast gel cassette. For some fluorescence applications, low fluorescence borosilicate glass plates and vinyl spacers are available.

Loading gel cassettes into the unit is simple. Slide up to six filled gel cassettes into slots on the anode assembly/cassette carrier then lower the carrier into the lower buffer chamber. The upper buffer chamber then slides down over the cassettes, sealing the upper ends of the cassettes into the chamber.

Efficient cooling and close temperature control in the Ettan DALTSix Electrophoresis Unit are maintained by the combination of the built-in ceramic heat exchanger and buffer circulation pump with an external MultiTemp™ III thermostatic circulator.

Ettan DALTSix system is modular in design. The system components include the Ettan DALTSix Electrophoresis Unit, Gel Caster, Gradient Maker, an EPS 601 Power Supply and MultiTemp III Thermostatic Circulator. Ettan

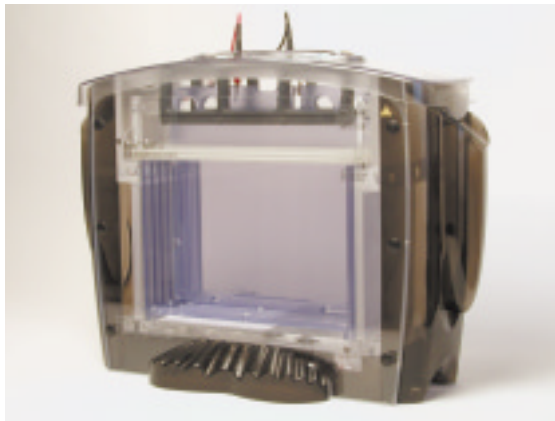


Fig 1. The compact 6-gel capacity Ettan DALTSix Electrophoresis Unit.

DALTwelve Electrophoresis System accessories, including blank cassette insert, separator sheets, filler sheets, cassette rack and staining tray set are fully compatible with Ettan DALTSix units.

Ettan DALTSix System is the newest member of a long line of innovative, durable and reliable vertical electrophoresis units, building on more than 30 years of experience in the field.

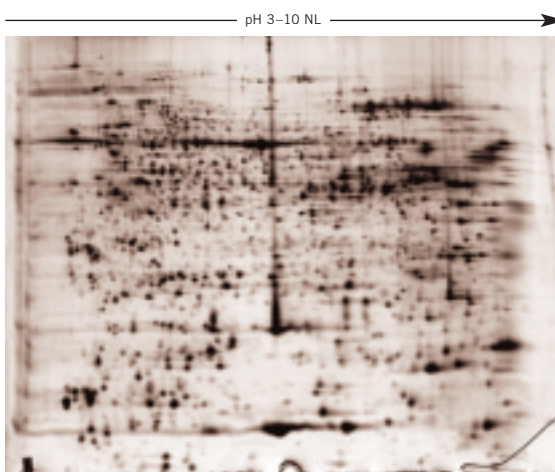


Fig 2. Brussel sprout (*Brassica oleracea* var. *Gemnifera*) extract separated in the first dimension on an Immobiline DryStrip 3–10 NL, 24 cm. The second dimension was separated on the Ettan DALTSix with a 12.5% T, 2.7% C polyacrylamide gel using the Laemmli buffer system.

## The compact 6-gel Ettan DALTSix Electrophoresis Unit is simple to assemble and use

Only four parts are needed to assemble an Ettan DALTSix Electrophoresis Unit (See Fig 4):

1. the lid with anode (+) and cathode (-) leads and cathode electrode,
2. the upper buffer chamber (Fig 3),
3. anode assembly/cassette carrier, and
4. lower buffer chamber with built-in ceramic heat exchanger and buffer circulation pump (see Fig 4).

Connecting the heat exchanger to a MultiTemp III Thermostatic Circulator is quick and mess-free through the QuickFit connectors pre-assembled on the heat exchanger tubing.

Parallel strands of platinum wire installed in the lid and the anode assembly/cassette carrier control the uniformity of the electrical field.

A set of distribution ports on the lower edge of the anode assembly/cassette carrier direct buffer circulation around and between the cassettes for efficient heat control. Buffer circulates into the lower buffer chamber on the right-hand side, up between the cassettes, down the left-hand side and across the ceramic heat exchanger.

Assembling the system for an electrophoresis run starts by inserting the anode assembly/cassette carrier into the lower buffer chamber and the anode buffer. Then turn on the buffer circulation pump and MultiTemp III.

Insert up to 6 filled gel cassettes into the slots in the cassette carrier. When you run fewer than six gels, fill remaining slots with blank cassette inserts.



Fig 3. Upper Buffer Chamber with slots for 6 cassettes.

The upper buffer chamber has six gel slots and a center handle slot, each flanked by a double rubber gasket to seal the cassettes in place (See Fig 3). The buffer chamber simply slides down over the tops of the gel cassettes and blank inserts.

Add cathode buffer to the upper buffer chamber, check that buffer levels are equal, set the safety lid in place, connect the power supply and start the electrophoresis run.

The lid has an integral safety interlock that disconnects the power to the electrodes if the lid is opened during the run.

When the electrophoresis run is complete, remove the lid. Lift out the cassette carrier. Remove the upper buffer chamber, and slide the gel cassettes from the slots. Open them with a Wonder Wedge tool.

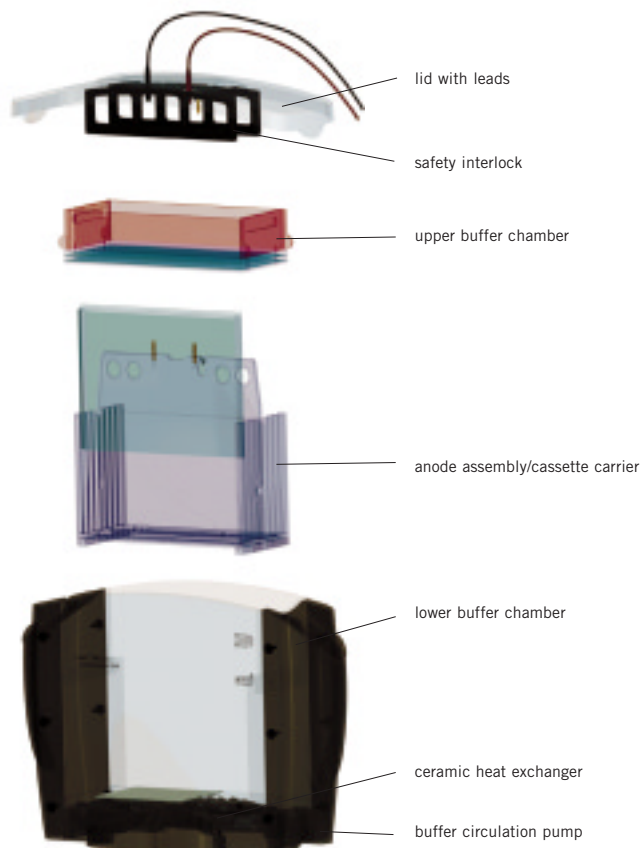


Fig 4. Exploded view of Ettan DALTSix Electrophoresis Unit.

## Ettan DALTSix Gel Caster and Gradient Maker

Ettan DALTSix Gel Caster holds up to six 1.0 mm or 1.5 mm cassettes with separator sheets for casting homogeneous or gradient gels. If fewer gels are to be cast, the unused volume is filled with blank cassette inserts and filler sheets.

Pouring gel solution into the filling groove in the back wall of the caster fills the cassettes from below to produce consistently uniform gels.

The Ettan DALTSix Gradient Maker is designed to produce linear, convex and concave exponential gradients of solutions ranging in volume from 200–1000 ml. A sliding valve at the bottom quickly connects or disconnects the chambers.



Fig 5. Ettan DALTSix Gel Caster for casting 1.0 and 1.5 mm large format gels.



**Fig 6.** Pre-assembled hinged Gel Casting Cassette for 26 × 20 cm lab-cast gels. The differential plate heights ease IPG strip loading. The two glass plates are joined along the left edge by a silicone rubber hinge. Sticky vinyl spacers, 1.0- or 1.5-mm thick, are glued on each edge of the long plate. Close and open the cassette like a book.

### Choose large format lab-cast or pre-cast gels for Ettan DALTSix runs

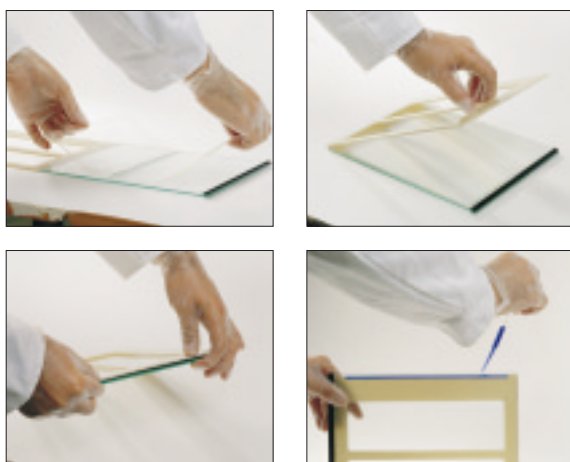
The large format gels are 26 cm wide by 20 cm long to accept both 18- or 24-cm IPG strips. Your choices for the second dimension gel include casting your own 1.0- or 1.5-mm thick gels and using 1-mm thick pre-cast Ettan DALT Gel 12.5.

For regular lab-cast gels we recommend the pre-assembled hinged gel casting cassette (See Fig 6).

Glass Plate Set (80-6475-39) is used for lab-casting 1.0-mm thick gels that will be used for spot picking. The set includes one short glass plate and one long glass plate with spacers attached. These plates are not hinged.

LF Glass Plate Set (80-6475-58) is used for lab-casting 1.0 mm thick gels for fluorescence scanning applications such as 2-D Difference Gel Electrophoresis (DIGE).

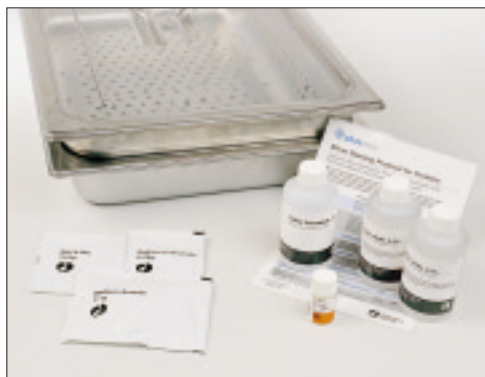
No more handling of acrylamide solutions is required when using large format (26 × 20 cm) pre-cast Ettan DALT Gel 12.5 for second dimension separations. The polyacrylamide gel is bound to a plastic support film, which eases handling and assures dimensional stability. The Ettan DALT Buffer Kit for the pre-cast gels includes concentrated buffers and agarose sealing solution. Ettan DALT Gel 12.5 and Ettan DALT Buffer Kit use a patented buffer formulation for long storage stability and high reproducibility.



**Fig 7.** Plastic backed Ettan DALT pre-cast gel loaded into pre-cast gel cassette. The cassette is designed for easy application of the IPG strip and agarose sealing solution.

## Multiple gel staining with Ettan Staining Tray Set

Large format second dimension gels can be conveniently stained in the Ettan Staining Tray Set. For high sensitivity and reliable detection of proteins, we recommend the PlusOne Silver Staining Kit, Protein.



**Fig 8.** PlusOne Silver Staining Kit and Ettan DALTtwelve Staining Tray Set. The set includes 1 perforated stainless steel tray (23 × 42 cm), 2 stainless steel trays and 1 clear plastic lid.

**Table 1. Ettan DALTSix System ordering guide**

product	needed with lab-cast gels	needed with pre-cast gels	needed for 2-D DIGE
Ettan DALTSix Electrophoresis Unit	×	×	×
PlusOne equilibration chemicals (Tris, Urea, Glycerol, SDS, DTT, Bromophenol Blue)	×	×	×
Equilibration Tube Set, 12/pk (80-6467-79)	×	×	×
Ettan DALTSix Gel Caster (80-6485-46)	×		×
Ettan DALTSix Gradient Maker (80-6487-36)	×		×
PlusOne gel casting chemicals and buffers (Acrylamide, Bisacrylamide, TEMED, Ammonium persulfate, Tris, Glycine)	×		×
Ettan DALT Gel Casting Cassette 1.0 mm (80-6466-84)	×		
Ettan DALT Gel Casting Cassette 1.5 mm (80-6488-69)	×		
Ettan DALT LF Glass Plate Set (80-6475-58)	×		×
Ettan DALT Glass Plate Set (80-6475-39)–see*	×		
Ettan DALT Pre-cast Gel Cassette (80-6466-65)		×	
Roller (80-1106-79)		×	
Ettan DALT Gel 12.5 6/pk (17-6002-36)		×	
Ettan DALT Buffer Kit (17-6002-50)		×	
Ettan DALT Blank Cassette Insert (80-6467-03)	×	×	×
Wonder Wedge (80-6127-88)	×	×	×
Ettan DALT Cassette Rack, 2/pk (80-6467-98)	×	×	×
PlusOne staining chemicals (Silver, Coomassie)	×	×	
Ettan Staining Tray Set (80-6468-17)	×	×	
Ettan DALT Separator Sheets–see <sup>†</sup> 0.5 mm, 16/pk (80-6467-41)	×		×
Ettan DALT Filler Sheets–see <sup>†</sup> 1.0 mm, 6/pk (80-6467-60)	×		×
Ettan DALT Cassette Removal Tool–see <sup>‡</sup> 2/pk (80-6474-82)	×	×	×

\*Only needed when spot picking lab-cast gels, and when background fluorescence is not a concern.

<sup>†</sup>Included with caster.

<sup>‡</sup>Included with main instrument.

## Specifications

### Ettan DALTSix Electrophoresis Unit

Gel capacity	6 gels
Electrophoresis buffer volume	4.5 l (anode) 0.8 l (cathode)
Circulation pump voltage	115 V/60 Hz or 220 V/50 Hz
Buffer circulation pump rate	≈ 10 l/min
Cooling	Ceramic heat exchanger
Pressure limit ceramic heat exchanger	87 kPa (12 psi)
Maximum temperature	40 °C
Environmental operating conditions	Indoor use, 4–40 °C Humidity up to 90% Installation category II
Pollution degree	2
Safety features	Safety interlock lid, submersible pump
Product and safety certifications	EN61010-1, UL3101-1, CSA22.2 1010.1, EMC EN61326, CE marked
Dimensions (h × w × d)	40 × 54 × 16 cm
Weight	12.2 kg

### Ettan DALTSix Gel Caster

Gel Capacity	6 gels, 1.0 mm or 1.5 mm thick
Volume (total acrylamide solution)	425 ml for 1.0 mm thick gels, 550 ml for 1.5 mm thick gels
Dimensions (h × w × d)	27 × 37 × 8 cm
Weight	3.6 kg

### 1.0 mm Gel Casting Cassettes

Cassette dimensions (w × h × d)	27.6 × 21.7 cm × 7 mm
Slab gel dimensions (w × h × d)	25.5 × 20.5 cm × 1.0 mm

### 1.5 mm Gel Casting Cassettes

Cassette dimensions (w × h × d)	27.6 × 21.7 × 7.5 mm
Slab gel dimensions (w × h × d)	25.5 × 20.5 × 1.5 mm

### Ettan DALTSix Gradient Maker

Volume	1 000 ml
Weight	0.73 kg

\*This declaration of conformity is only valid for the instrument when it is:

- used in laboratory locations,
- used as delivered from Amersham Biosciences, except for alterations described in the User Manual, and
- connected to other CE-labeled instruments or products recommended or approved by Amersham Biosciences.

## Ordering information

product	code no.
Ettan DALTSix Electrophoresis Unit, 115 V Includes: Two pieces 2 m long vinyl tubing with one pair of QuickFit Connectors, 1 Cassette removal tool	80-6485-08
Ettan DALTSix Electrophoresis Unit, 220 V Includes: Two pieces 2 m long vinyl tubing with one pair of QuickFit Connectors, 1 Cassette removal tool	80-6485-27
Ettan DALT Gel Casting Cassette 1.0 mm	80-6466-84
Ettan DALT Gel Casting Cassette 1.5 mm	80-6488-69
Ettan DALT Pre-cast Gel Cassette	80-6466-65
Ettan DALT LF Glass Plate Set Includes: 2 borosilicate glass plates, with attached spacers	80-6475-58
Ettan DALT Glass Plate Set Includes: 2 glass plates with attached spacers	80-6475-39
Wonder Wedge	80-6127-88
Ettan DALT Blank Cassette Insert	80-6467-03
Ettan DALT Gel Caster Includes: 7 Separator Sheets 0.5 mm and 6 Filler Sheets 1.0 mm. (Order cassettes separately)	80-6485-46
Ettan DALT Separator Sheets 0.5 mm, 16/pk	80-6467-41
Ettan DALT Filler Sheets 1.0 mm, 6/pk	80-6467-60
Ettan DALT Gradient Maker	80-6487-36
Equilibration Tube Set, 12/pk	80-6467-79
Ettan DALT Cassette Removal Tool, 2/pk	80-6474-82
Ettan DALT Cassette Rack, 2/pk	80-6467-98
Ettan Staining Tray Set Includes: 1 perforated stainless steel tray (23 × 42 cm), 2 stainless steel trays and 1 clear plastic lid	80-6468-17
Roller	80-1106-79
Ettan DALT Gel 12.5 (26 × 20 cm), 6/pk	17-6002-36
Ettan DALT Buffer Kit, for 12 pre-cast gels	17-6002-50
EPS 601 Power Supply 6–600 V, 1–400 mA, 1–100 W	18-1130-02
MultiTemp III Thermostatic Circulator, 115 V	18-1102-77
MultiTemp III Thermostatic Circulator, 220 V	18-1102-78
PlusOne equilibration, gel casting and staining chemicals, buffers. See BioDirectory Catalogue	
Handbook: 2-D Electrophoresis Using Immobilized pH Gradients, Principles & Methods	80-6429-60

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