

designed to

WORK

Ettan
IPGphor II

First-Dimension Isoelectric Focusing System



Ettan IPGphor II

A professional solution for professionals

Ettan IPGphor II overcomes the most common hurdles of existing technology to consistently deliver high-throughput, speed, reproducibility, and high protein-loading capacity.

The original IPGphor system, designed for immobilized pH gradient IEF, has been upgraded and offers significant improvements. Ettan IPGphor II is easier to use, capable of generating fast, reproducible runs, and now features PC control.

Ettan IPGphor II Control Software enables creation, storage, and editing of protocols.

The new Ettan IPGphor Manifold is a high-throughput accessory that is optimized for first-dimension isoelectric focusing of micropreparative loads of proteins with speed, convenience, and reproducibility.

The extensive range of Immobiline™ DryStrip gels is now bar coded to enable sample and lot tracking.

New design for improved performance...



The newly designed Ettan IPGphor II is a fully integrated isoelectric focusing system optimized to deliver ease-of-use, reproducibility, and efficient operation. The large graphical display accommodates multiple (up to four) lines of text for fast and easy programming. Up to 10 protocols (nine steps each) can be saved, retrieved and easily edited on the instrument. Any number of protocols can be stored on a connected PC running IPGphor II Control Software and uploaded to the instrument instantly. Increased safety features ensure safe high-voltage runs, and with total start/stop control from your PC, IEF runs have never been easier.



Easy access to serial port

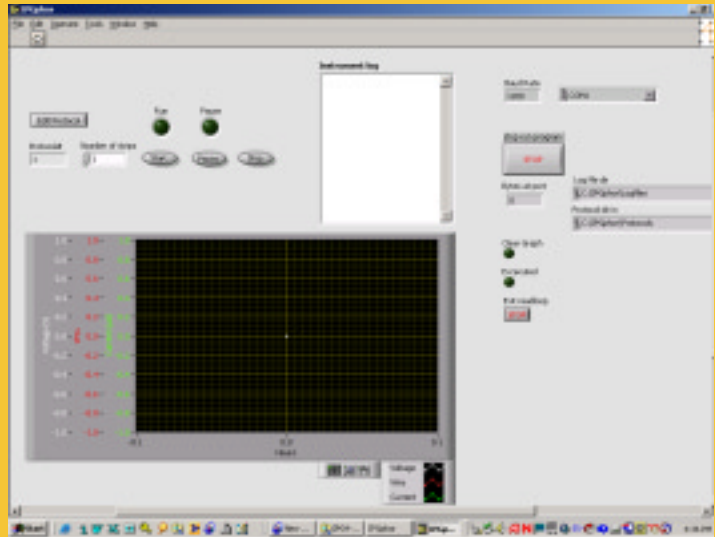


Enhanced user interface with four-line display



Leveling feet

- Integral 8000 V power supply
- Peltier solid-state temperature control (18–25 °C)
- Accommodates one manifold tray or 1-12 stripholders for 7, 11, 13, 18 and 24 cm IPG strips
- Programmable controller for voltage, temperature, and time



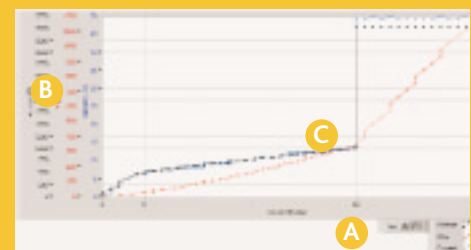
Enhanced software for improved control

Ettan IPGphor II Control Software can be used to control up to four Ettan IPGphor II units simultaneously, each running a different set of run parameters.

- Create, save and edit protocols
- Monitor voltage, current, and volt-hours of the run and generate graphical display as the run proceeds
- Open and view stored log files of previous runs
- Start, stop, and pause the Ettan IPGphor II
- Generate status report on Ettan IPGphor II (instantaneous run condition report on request)
- Enable Web browser remote monitoring of PC control unit
- Export log files to programs such as Microsoft® Excel®.
- Create professional reports that can be saved, printed, and exported

Instrument log

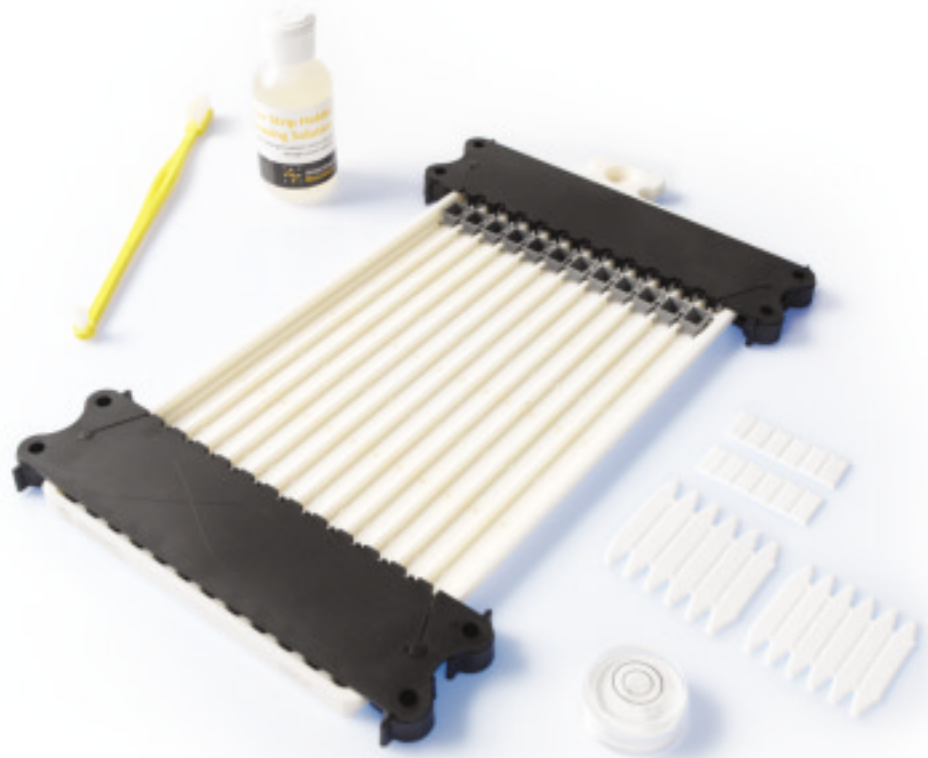
Time	Voltage	Current	Volt-hours
0:30	-> 3518V	at 49uA	345Vhrs
0:31	-> 3518V	at 49uA	390Vhrs
0:31	-> 3519V	at 49uA	435Vhrs
0:32	-> 3517V	at 50uA	480Vhrs
0:33	-> 3518V	at 49uA	525Vhrs
0:34	-> 3517V	at 50uA	570Vhrs
0:34	-> 3518V	at 50uA	615Vhrs
0:35	-> 3523V	at 49uA	660Vhrs
0:36	-> 3518V	at 49uA	705Vhrs
0:37	-> 3518V	at 49uA	750Vhrs
0:37	-> 3518V	at 49uA	795Vhrs
0:38	-> 3517V	at 49uA	841Vhrs
0:38	-> 3518V	at 49uA	886Vhrs



A – Trend lines B – Scales C – Voltage, current, and volt-hours



manifold improved strip processing



The Ettan IPGphor Manifold is a high-throughput cup-loading accessory for first-dimension isoelectric focusing of proteins on IPG strips. The newly designed manifold meets the ever-growing demands of proteomics research and delivers high-resolution micropreparative protein analysis. Ettan IPGphor Manifold simplifies isoelectric focusing of multiple samples and reduces first-dimension hands-on time to a minimum. This significantly speeds up the processing of micropreparative loads in first dimension analysis.

The unique design of the manifold handles isoelectric focusing and subsequent equilibration for up to 12 IPG strips. Designed for maximum flexibility, the manifold can accommodate all IPG strip sizes of 7, 11, 13, 18, and 24 cm. The manifold's versatility makes it possible to use for equilibrating the IPG strips after first-dimension IEF, which saves substantial time and reduces the number of parts. Ettan IPGphor Manifold comes with a complete set of accessories to run 10 full runs of 12 strips each, including forceps, cleaning brush, IPGphor zcleaning solution and a spirit level. The manifold is also compatible with the first-generation Ettan IPGphor.

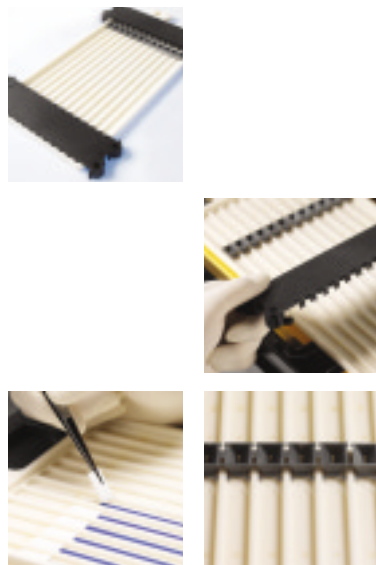
Designed for your advantage

Unique cup-loading application

The unique cup-based sample application improves protein-focusing patterns, particularly in basic IPG strips, and accommodates both anodic and cathodic loading. Under conditions where substantial water transport, or electroendosmosis, accompanies focusing, such as with protein loads in excess of 1 mg, the face-up mode frequently yields improved resolution.

Manifold tray for easy placement

The manifold tray base is made of a thermally conductive aluminum oxide ceramic that rapidly dissipates heat to avoid "hot spots." A further special coating of the surface eliminates protein absorption. The manifold tray allows simple and accurate placement of IPG strips, with protrusions along the numbered inner channels that keep IPG strips straight and centered.



Electrode assembly

State-of-the-art electrode and sample cup design ensure consistent quality and superior results for micropreparative runs. The movable electrodes can be easily adjusted to any strip length (from 7–24 cm), and can be placed on any of the assigned positions along the manifold where the electrode pins will make electrical contact with the power supply on the bed of IPGphor. Special hold-down teeth apply pressure on the paper bridges when the manifold is used to run large protein loads by paper bridge loading the samples, and specially designed cams on the sides of the electrodes secure the electrodes in place.

Sample cups

Sample cups can be used to load more protein in discrete sample zones and can run the IPG strip "gel-side-up." Each cup can hold sample volumes of up to 150 μ l, and can be properly positioned and sealed over the IPG strips with an innovative sample cup insertion tool.

Electrode wicks and paper bridges

Pre-cut electrode pads and paper bridges are convenient and save valuable time. The wicks absorb excess water, salts, and proteins while the paper bridges can be used to load large sample volumes, as well as ensure that the wicks are not contaminated with human proteins during cutting.

Ettan IPGphor II Strip Holders

The innovative IPGphor Strip Holder serves as both a rehydration and focusing chamber for individual IPG strips. When the sample is included in the rehydration solution, it is loaded into the gel by absorption during the rehydration. Since the rehydrated gel is in direct contact with electrodes built into the strip holder, it is placed in position to run without further handling.

The base of the strip holder is made from the same thermally conductive aluminum oxide ceramic as the manifold and has platinum electrodes at each end. The transparent strip holder cover enables easy visual monitoring of rehydration and focusing progress.





Immobiline DryStrip with IPG Buffer

For unmatched reproducibility, resolution, and accuracy

- High batch-to-batch reproducibility
- Superior accuracy
- Optimized running conditions
- Excellent resolution with no background staining
- High sample loading

For excellent first-dimension separation, the best choice is Immobiline DryStrip gels with IPG Buffer. The IPG strip delivers unrivaled resolution and high reproducibility, without compromising throughput, loading capacity, or maximum running conditions. The IPG Buffers ensure stable pH gradients to deliver the highest degree of accuracy, and the buffers eliminate the problem of background staining. The high-quality first-dimension results from the Ettan IPGphor II platform ensures that spots in the second dimension are well separated.

And the growing range of precast 24 cm IPG strip gels with broad, medium, and narrow pH ranges simplifies and accelerates development of concise targeted strategies for analyzing complex cell extracts.

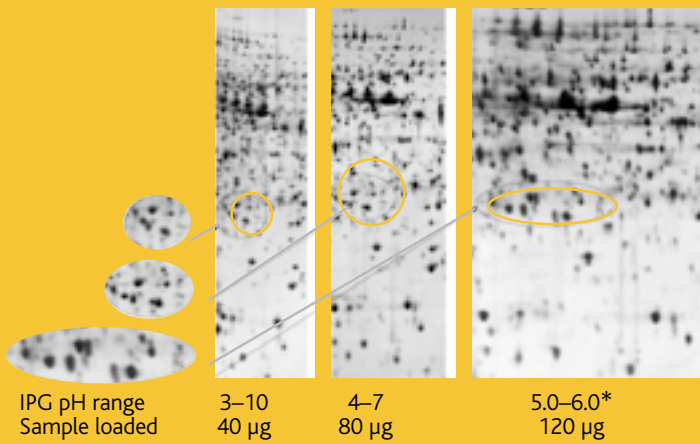
Shorter strips for rapid screening, or when only the most abundant proteins are of interest.

Longer strips for maximal resolution and loading capacity.

To overview total protein distribution, use pH interval of 3–10.

Barcode for IPG strips and DALT Gel 12.5

- Convenient sample and lot tracking
- Minimizes risk of mixing samples up
- Easy to transfer with a barcode reader to electronic laboratory journal pages composed in popular office programs, such as Microsoft WordPad, Microsoft Word, Microsoft Excel
- Supports sample tracking in Ettan 2D-MS LWS software



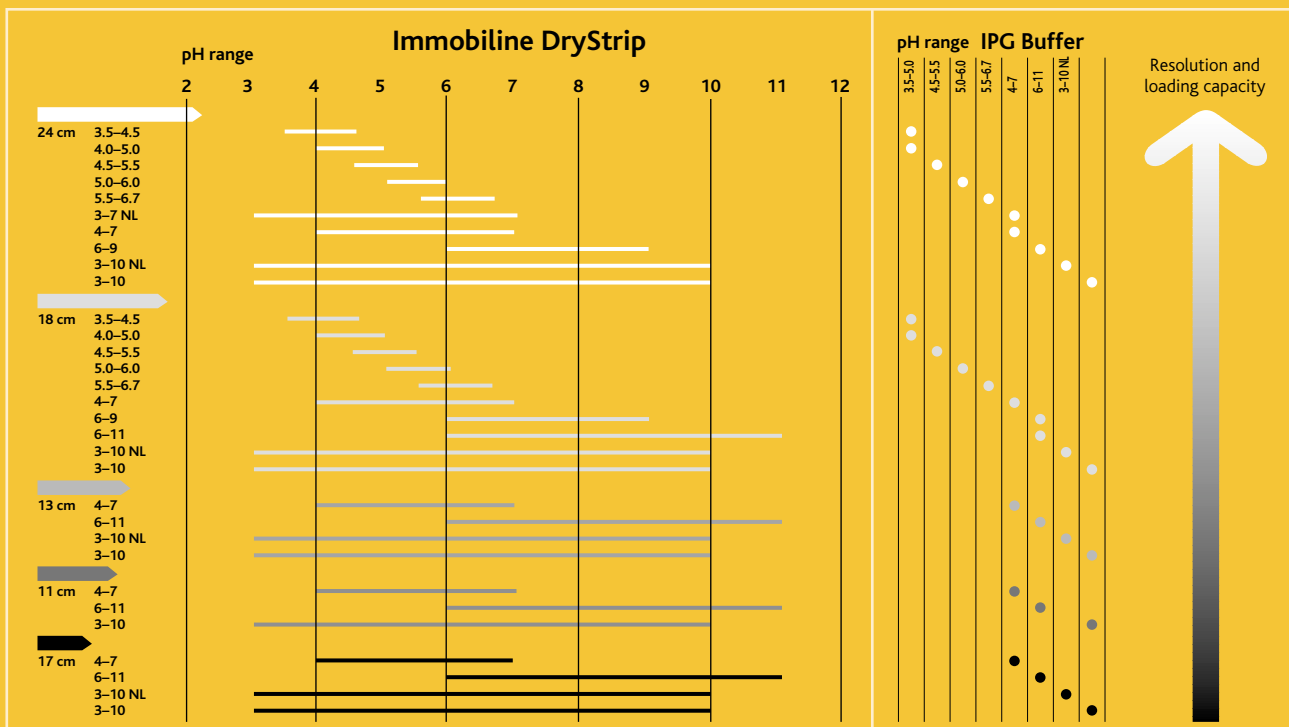
*Using pH 5.0-6.0 reveals more spots at greater distances apart than when using pH 3-10

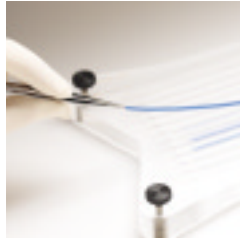
Flexibility for the results you need

For increased resolution between pH 5 and 7, use a nonlinear gradient, pH 3-10 strip to distribute the proteins more evenly over the gel

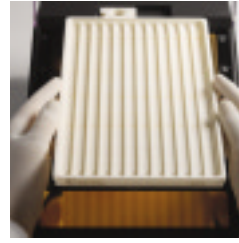
Combine pH 4-7 and pH 6-11 (or pH 4-7 and pH 6-9) for more detail

Use narrow pH range (1 pH unit) IPG strips to closely study proteins in the regions of interest

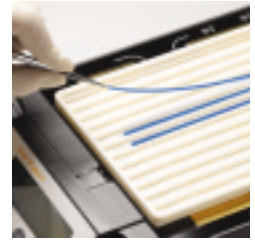




step 1



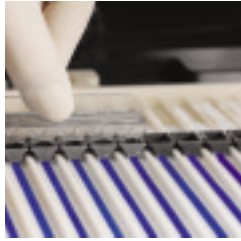
step 2



step 3

High-throughput micropreparative runs made easy

First-dimension isoelectric focusing in micropreparative scale of multiple samples can be challenging. But with the improved Ettan IPGphor II, with its innovatively designed Manifold, first-dimension separation with high resolution is easy. With the gel side facing up, samples are applied in a localized region through an open-bottom loading cup. This cup loading technique improves protein-focusing patterns, particularly on basic IPG strips (pH 6–9 and 6–11).



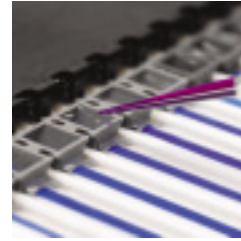
step 4



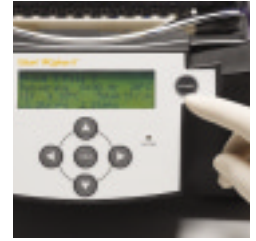
step 5



step 6



step 7



step 8

Step 1 – Rehydrate IPG strips

Rehydrate Immobiline DryStrip gels, with the gel side down, in the appropriate volume of rehydration solution, using Immobiline DryStrip Reswelling Tray. Allow the IPG strips to rehydrate overnight (10–20 h).

Step 2 – Position Manifold

Position the Manifold on Ettan IPGphor II. The small T-shaped protrusion fits into the cutout section of the Ettan IPGphor II bed making positioning easy.

Step 3 – Transfer to Cup Loading Manifold

Pour the appropriate volume of Immobiline DryStrip Cover Fluid evenly in all the channels. Transfer the IPG strips to the Ettan IPGphor II Cup Loading Manifold. Place them face up in the tray with the anodic (+) end of the strip resting on the appropriate mark etched on the bottom of the Manifold track. Fill the Manifold with strip cover fluid. The Manifold can be used for cathodic loading as well.

Step 4 – Seat Cups in Track

Place a strip of cups in the appropriate position. The convenient seating tool enables you to push the cups down so that they are properly seated at the bottom of the track.

Step 5 – Moisten and Place Electrode Pads

Wet the pre-cut electrode pads with deionized water and blot until they are almost completely dry. Place the pads on the IPG strips.

Step 6 – Position Electrode Assembly

Slide an electrode assembly over the top of all the pads. Swivel the cams into the position under the external lip of the Manifold to seat the electrode in place.

Step 7 – Load and Cover Samples

Load the samples into the sample cups, up to a maximum of 150 µl. Check to make sure that the samples are completely covered with strip cover fluid.

Step 8 – Set Program Parameters and Run

Close the Ettan IPGphor II cover. Select program and desired run parameters and begin the run.

Post Electrophoresis – Equilibration

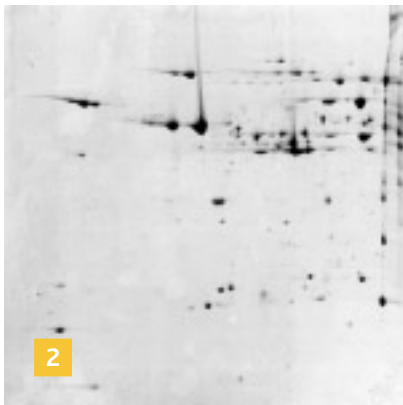
At the end of a run, the Manifold may be used to equilibrate the strips to prepare for second-dimension electrophoretic analysis.

- 1 Remove the electrode assembly, wicks and bridges from the anodic (+) side of the strips and discard the strip cover fluid.
- 2 Add equilibration solution (5–6 ml) to each track and incubate the IPG strips in the solution.
- 3 Discard the equilibration solution and either add other solutions as needed, or place strips on top of second-dimension gels.



1 Preparative run: Immobiline DryStrip pH 3-10, 24cm. Sample: 1.7 mg *E. coli* containing 50 mM Tris. Samples were rehydrated with DeStreak™ Rehydration Solution, transferred to the Manifold and run on the Ettan IPGphor II for first-dimension IEF. Sample was focused for 124 kVh and run on Ettan DALT*twelve* Large Vertical Electrophoresis System for the second dimension.

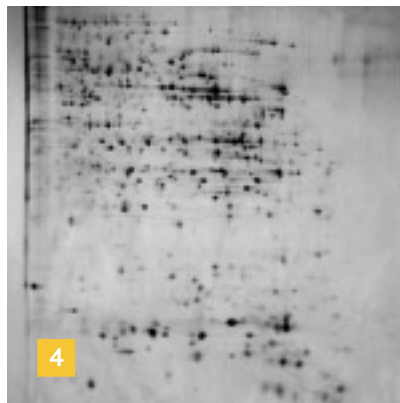
Enhanced 2-D separations ..



2 Preparative run: Immobiline DryStrip pH 4.5-5.5, 24 cm, rehydrated in DeStreak Rehydration Solution. Sample: 85 µl mouse liver extract containing 2.5 mg proteins diluted with 300 µl DeStreak Rehydration Solution and applied with a paper bridge at the anode. Total run time was 95 kVh. Coomassie™ stained.



3 Preparative run: Immobiline DryStrip pH 4.5-5.5, 24 cm. Sample 85 µl mouse liver extract containing 2.5 mg protein. Sample applied by rehydration loading 20 mM DTT in sample and rehydration solution. Total run time was 95 kVh. Coomassie stained.



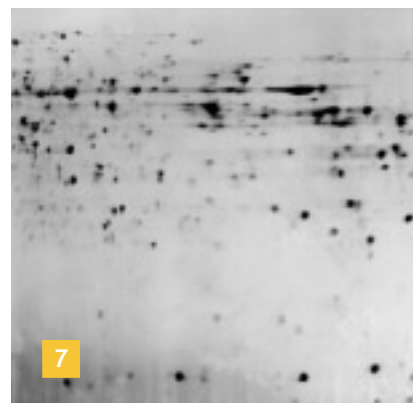
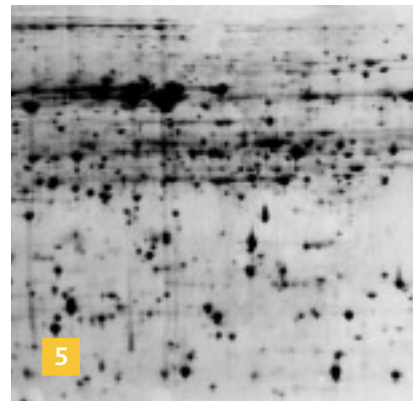
4 Analytical run: Anodic cup application. Immobiline DryStrip pH 6-11, 18 cm rehydrated in DeStreak Rehydration Solution. Sample: 60 µl mouse liver extract containing 75 µg proteins. Total run time 26 kVh. Silver stained.

for better protein identification

5 Preparative rehydration loading:
Immobiline DryStrip pH 5.0–6.0, 24
cm, DeStreak Rehydration Solution.
Sample: 2 mg *E. coli* proteins applied in
the rehydration solution. Total run time
95 kVh. Coomassie stained.

6 Preparative run, paper bridge
sample application: Immobiline
DryStrip pH 5.0–6.0, 24 cm,
DeStreak Rehydration Solution.
Sample: 2.4 mg mouse liver proteins
diluted in 320 μ l DeStreak Rehydration
solution applied at the anode. Total
run time 95 kVh. Coomassie stained.

7 Preparative run, paper-bridge
sample application: Immobiline
DryStrip pH 6–9, 24 cm, DeStreak
rehydration solution.
Sample: 1.4 mg mouse liver proteins in
270 μ l DeStreak Rehydration Solution
applied at the anode. Total run time
95 kVh. Coomassie stained.



Technical Information

Ettan IPGphor II

Working surface		Operating environment	
Electrode areas	Gold-plated copper	Temperature	15–35 °C
Strip Holder capacity	Up to 12 fixed-length, on one manifold tray	Relative humidity	0–70%
Platform temperature	15–30 °C	Power requirements	
Strip holders		Line voltage	115/230 V~
Material	Aluminum oxide ceramic base, acrylic cover, polycarbonate, platinum on titanium	Frequency	50/60 Hz
Holders	For IPG strip lengths: 7, 11, 13, 18, and 24 cm	Power consumption	100 W
Cup loading manifold	For all strip lengths, cup and bridge loading	Power outputs	
User interface		Voltage	0–8000 V, resolution: 10 V
Control panel	Seven-key membrane keypad	Current	0–1.5 mA, resolution: 1 µA
Liquid crystal display (LCD)	Four lines, 24 characters per line	Power	12 W max.
Programmable parameters	Rehydration time, platform temperature, maximum current limit per strip, step voltage, step voltage change pattern, and step duration	Physical parameters	
Protocol capacity	10, with up to 9 steps each	Dimensions (h x w x d)	14 x 25 x 46 cm
Serial port	RS232C, 1200 or 9600 baud, 8 data bits, 1 stop bit, no parity, no flow control	Weight	6.8 kg (15 lbs)
		Safety	
		Safety features automatic voltage cutoff when safety lid is opened	
		Safety certifications CE, UL, CSA	

Ettan IPGphor II Control Software

Software requirements	PC Windows® 98 SE (Second Edition) or higher, Windows NT® or Windows 2000.
Hardware requirements	Serial port RS232. If multiple Ettan IPGphor II units are to be controlled, an RS232 expansion box is required.

new!

**How to
order**

The Ettan IPGphor II platform is available in three application-based options

for High-Throughput Analytical and Micropreparative Protein Analysis. Complete solution.

- 80-6505-03 Ettan IPGphor II Isoelectric Focusing Unit
- 80-6498-38 Ettan IPGphor Manifold - complete**
- 80-6465-32 Reswelling Tray, 7–24 cm
- Range of ceramic Strip Holders to run 7,11,13,18 or 24 cm IPG strips***
- Range of IPG strips and buffers*

for High-throughput Micropreparative Applications

- 80-6505-03 Ettan IPGphor II Isoelectric Focusing Unit
- 80-6498-38 Ettan IPGphor Manifold - complete**
- 80-6465-32 Reswelling Tray, 7–24 cm
- Range of IPG strips and buffers*

for Analytical Study of Protein Profiles

- 80-6505-03 Ettan IPGphor II Isoelectric Focusing Unit
- Range of ceramic Strip Holders to run 7,11,13,18 or 24 cm IPG strips***
- Range of IPG strips and buffers*

* see Web site for more details

** includes accessories for 10 complete runs of 12 IPG strips

*** essential accessories (see below)



essential accessories

Strip Holders

Product	Quantity	Code Number
7 cm, complete	6	80-6416-11
11 cm, complete	6	80-6416-30
13 cm, complete	6	80-6416-49
18 cm, complete	6	80-6416-68
24 cm, complete	6	80-6469-88
7 cm, complete	1	80-6416-87
11 cm, complete	1	80-6417-06
13 cm, complete	1	80-6417-25
18 cm, complete	1	80-6417-44
24 cm, complete	1	80-6470-07

Strip Holder Covers

7 cm	2	80-6455-44
11 cm	2	80-6455-63
13 cm	2	80-6455-82
18 cm	2	80-6456-01
24 cm	2	80-6479-76

Other Essentials

Product	Quantity	Code Number
Immobiline DryStrip Reswelling Tray, 7–18 cm	1	80-6371-84
Immobiline DryStrip Reswelling Tray, 7–24 cm	1	80-6465-32
Strip Holder Cleaning Solution 950 ml	1	80-6452-78
2-D Electrophoresis Principles and Methods	1	80-6429-60
Equilibration tube set for 24 cm IPG Strips	12	80-6467-79
IEF electrode strips	100	18-1004-40
Manifold sample cups (6)	20	80-6498-95
Pre-cut electrode wicks (6)	40	80-6499-14
Pre-cut paperbridge pads (6)	20	80-6499-33
Manifold electrode set	1	80-6498-76
Lid adapter	1	80-6499-71
Cleaning brush	1	80-6505-98
Spirit level	1	80-6194-19
Forceps SS	1	80-6506-17



For more information about our IPGphor platform, visit:

www.designed-to-work.com

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