SIGMA-ALDRICH

INSTRUCTION MANUAL

HORIZONTAL ELECTROPHORESIS UNITS

MINI (Z33,879-6), MIDI (Z33,881-8), MAXI (Z33,882-6), MAXI COOLED (Z33,883-4), MAXI-PLUS (Z33,884-2), MAXI-PLUS COOLED (Z33,885-0).

WARNING

THESE UNITS ARE CAPABLE OF DELIVERING POTENTIALLY LETHAL VOLTAGE WHEN CONNECTED TO A POWER SUPPLY AND ARE TO BE OPERATED ONLY BY QUALIFIED TECHNICALLY TRAINED PERSONNEL.

PLEASE READ THE ENTIRE OPERATOR'S MANUAL THOROUGHLY BEFORE OPERATING THIS UNIT.

THESE UNITS COMPLY WITH THE STATUTORY CE SAFETY DIRECTIVES:

73/23/EEC: LOW VOLTAGE DIRECTIVE: IEC 1010-1:1990 plus AMENDMENT 1:1992

EN 61010-1:1993/BS EN 61010-1:1993

THE SIGMA HORIZONTAL ELECTROPHORESIS UNITS ARE DESIGNED TO GIVE LONG SERVICE AND REPRODUCIBLE RESULTS IN YOUR LABORATORY. A FEW MOMENTS SPENT READING THESE INSTRUCTIONS WILL ENSURE THAT YOUR EXPECTATIONS ARE REFLECTED IN THE SUCCESSFUL USE OF THE APPARATUS.

FIRST CHECK THAT THE APPARATUS HAS BEEN RECEIVED COMPLETE AND UNDAMAGED FOLLOWING SHIPMENT. ANY FAULTS OR LOSSES MUST BE NOTIFIED TO SIGMA-ALDRICH IMMEDIATELY, SIGMA-ALDRICH CANNOT ACCEPT RESPONSIBILITY FOR GOODS RETURNED WITHOUT PRIOR NOTIFICATION.

REFER TO THE PACKING LIST AND CHECK THAT ALL COMPONENTS AND ACCESSORIES ARE PRESENT.

PLEASE RETAIN ALL PACKAGING MATERIALS UNTIL THE WARRANTY PERIOD HAS EXPIRED.

SPECIFICATIONS:

Construction:

- Rugged acrylic construction.
- All acrylic joints chemically bonded.
- Doubly insulated cables, rated safe up to 1,000 volts.
- Gold plated electrical connectors, corrosion-free and rated safe up to 1,000 volts.
- Recessed power connectors, integral with the safety lid.
- 0.2mm diameter platinum electrodes, 99.99% pure.
- Removable UV transparent gel casting trays.
- Mini unit supplied with two casting trays, 6 x 7cm and 6 x 10cm. Trays slotted and provided with Aluminium casting gates.
- Midi, Maxi and Maxi-Plus units supplied with standard casting trays (require tape to cast gels)
- Combs colour coded for thickness.
- 1.0mm - White
- 1.5mm - Red
- 2.0mm - Blue
- Combs adjustable in height.
- Buffer re-circulation and cooling available.

Environmental Conditions:

- This apparatus is intended for indoor use only.
- This apparatus can be operated safely at an altitude of 2,000m.
- The normal operating temperature range is between 4°C and 65°C.
- Maximum relative humidity 80% for temperatures up to 31^{O}C decreasing linearly to 50% relative humidity at 40^{O}C.

The apparatus is rated POLLUTION DEGREE 2 in accordance with IEC 664. POLLUTION DEGREE 2, states that: “Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected”.

PACKING LISTS

MINI (Z33,879-6)

No. Items	Description	Replacement Part Number	Check
1	Main Horizontal Unit with Safety Lid	-	
1	Gel Casting Tray 6 X 7cm, with Al gates	Z33,901-6	
1	Gel Casting Tray 6 X 10cm, with Al gates	Z33,902-4	
1	Comb 1.0mm, 8 Sample	Z33,887-7	
1	Comb 1.0mm, 12 Sample	Z33,888-5	
1	Coloured Loading Strips (pk)	Z33,904-0	

MIDI (Z33,881-8)

No. Items	Description	Replacement Part Number	Check
1	Main Horizontal Unit with Safety Lid	-	
1	Gel Casting Tray 13 X 15cm	Z34,044-8	
1	Comb 1.0mm, 12 Sample	Z33,907-5	
1	Comb 1.0mm, 16 Sample	Z33,908-3	
1	Buffer Re-circulation Ports, PK/2	Z33,931-8	
1	Coloured Loading Strips (pk)	Z33,929-6	

MAXI AND MAXI-COOLED (Z33,882-6, Z33,883-4)

No. Items	Description	Replacement Part Number	Check
1	Main Horizontal Unit with Safety Lid	-	
1	Gel Casting Tray 20 X 20cm	Z33,945-8	
2	Combs 1.0mm, 16 Sample	Z33,932-6	
1	Buffer Re-circulation Ports, PK/2	Z33,931-8	
1	Coloured Loading Strips (pk)	Z33,946-6	

MAXI-PLUS AND MAXI-PLUS COOLED (Z33,884-2, Z33,885-0)

No. Items	Description	Replacement Part Number	Check
1	Main Horizontal Unit with Safety Lid	-	
1	Gel Casting Tray 25 X 30cm	Z33,953-9	
2	Combs 1.0mm, 26 Sample	Z33,947-4	
1	Buffer Re-circulation Ports, PK/2	Z33,931-8	
1	Coloured Loading Strips (pk)	Z33,954-7	

USING THE HORIZONTAL GEL ELECTROPHORESIS UNITS

A. Safety Precautions

- READ the instructions before using the apparatus.
- Always isolate electrophoresis units from their power supply before removing the safety cover. Isolate the power supply from the mains FIRST then disconnect the leads.
- DO NOT exceed the maximum operating voltage or current (see table 1).
- DO NOT operate the electrophoresis units in metal trays.
- Ethidium bromide is a known mutagen. Wear effective protective clothing when handling and follow recommended handling and disposal procedures.
- Ultraviolet light can cause permanent damage to the retina and skin cancer. Wear UV safety goggles and cover any exposed skin when using a UV light source.
- Following the replacement of a platinum electrode have the unit inspected and approved by your safety officer prior to use.
- DO NOT fill the unit with running buffer above the maximum fill lines.
- DO NOT move the unit when it is running.
- CAUTION: During electrophoresis very low quantities of various gases are produced at the electrodes. The type of gas produced depends on the composition of the buffer employed. To disperse these gases make sure that the apparatus is run in a well ventilated area.

B. General Care and Maintenance

- To remove the safety lid, push thumbs down on the plastic lugs and lift the lid vertically with your fingers.
- Before use clean and dry the apparatus with DISTILLED WATER ONLY. IMPORTANT: Acrylic plastic is NOT resistant to aromatic or halogenated hydrocarbons, ketones, esters, alcohol's (over 25%) and acids (over 25%), they will cause "crazing" especially of the UV transparent plastic and should NOT be used for cleaning. DO NOT use abrasive creams or scourers. Dry components with clean tissues prior to use.
- Before use, and then on a monthly basis, check the unit for any leaks at the bonded joints. Place the unit on a sheet of dry tissue and then fill with DISTILLED WATER ONLY to the maximum fill line. Any leakage will be seen on the tissue paper. If any leakage is seen DO NOT ATTEMPT TO REPAIR OR USE THE APPARATUS, but notify SIGMA-ALDRICH immediately.
- The replacement platinum electrodes are partially shrouded for protection. However, when cleaning the main tank DO NOT use cleaning brushes in the electrode area. Usually a thorough rinse with distilled water is all that is required.
- Ensure that the connectors are clean and dry before usage or storage.

C. Gel Pouring:

1. Mini (Z33,879-6) & Midi (Z33,881-8)

- Slotted gel casting tray with Aluminium gates (supplied with Mini unit, optional extra for Midi unit)
- Place the gel casting gates in the slots provided in the ends of the casting tray.
- Place the gel unit on a level surface, or use the SIGMA-ALDRICH Gel Levelling Table, Cat. No: Z33,955-5.
- Position the required comb(s) into the slot(s) in the gel casting tray.
- Prepare 22.5 or 100mls of the desired % agarose for Mini (Z33,879-6) or Midi (Z33,881-8) units respectively. This will give a gel depth of 5mm. For a 10mm deep gel, prepare 45 or 200mls respectively. For additional information on preparing agarose gels, see pages 8 and 9.
- Pour in the agarose smoothly so as not to generate bubbles. If bubbles do occur, these can be smoothed to the side of the gel and dispersed using a clean gloved hand. (IMPORTANT: ensure that the agarose has cooled to between 50 and 60°C to prevent apparatus distortion).
- Allow the agarose to set, ensuring that the gel remains undisturbed.
- Carefully remove the gel casting gates and comb(s).
- Place the gel casting tray in the running position such that the wells are nearest to the black electrode (cathode).
- Fill the tank with running buffer so that the buffer just submerges the gel. Approximate volumes and details of running buffers can be found on pages 8 and 10 respectively

2. Mini (Z33,879-6) , Midi (Z33,881-8), Maxi (Z33,882-6), Cooled Maxi (Z33,883-4), Maxi-Plus (Z33,884-2) & Cooled Maxi-Plus (Z33,885-0)

- Seal the ends of the Gel Casting Tray with Gel Casting Tape.
- Place the tray on a level surface, or use the SIGMA-ALDRICH Gel Levelling Table, Cat. No: Z33,955-5.
- Prepare 22.5, 100, 200 or 375mls of the desired % agarose for units Mini, Midi, Maxi/Cooled Maxi and Maxi-Plus/Cooled Maxi-Plus respectively. This will give a gel depth of 5mm. For a 10mm deep gel, prepare 45, 200, 400 or 750 mls respectively. For more information on preparing agarose gels, see pages 8 and 9.
- Pour in the agarose smoothly so as not to generate bubbles. If bubbles do occur, these can be smoothed to the side of the gel and dispersed using a clean gloved hand. (IMPORTANT: ensure that the agarose has cooled to between 50 and 60°C to prevent apparatus distortion).
- Allow the agarose to set, ensuring that the gel remains undisturbed.
- Carefully remove the gel casting tape and comb(s).
- Place the gel casting tray in the running position such that the wells are nearest to the black electrode (cathode).
- Fill the tank with running buffer so that the buffer just submerges the gel. Approximate volumes and details of running buffers can be found on pages 8 and 10 respectively

D. Running the Gel:

- Samples should be mixed with a suitable marker dye or loading buffer prior to loading. This aids sinking of the sample into the well, and visualisation of how far the samples have run. Consult your laboratory manual for details on loading buffers.
- Load the samples into the wells taking care not to damage the sides or bottoms of the wells.
- Replace the lid correctly BEFORE connecting the leads to the power supply.
- Set the voltage and current to suit the electrophoretic application. As a guide, to obtain the optimum resolution of DNA fragments, agarose gels should not be run greater than 5V/cm. See page 8 for recommended voltage and current settings. IMPORTANT: Do not exceed the recommended voltage or current as this may result in poor band resolution and may result in damage to the unit.
- Long runs may require buffer re-circulation, to prevent over heating and or buffer depletion. Re-circulation ports are provided in the Midi (Z33,881-8), Maxi (Z33,882-6), Cooled Maxi (Z33,883-4), Maxi-Plus (Z33,884-2) and Cooled Maxi-Plus (Z33,885-0) units. IMPORTANT: When re-circulating buffer, remember that the buffer flowing through the tubing is live. Take all necessary precautions. Warn other workers in the vicinity of the potential hazard. Seek the advice of your safety officer.
- The Cooled gel units have a built-in cooling block in the base. The side connectors can be attached, via tubing, to the mains water supply or to a circulating water bath.

E. At the End of the Run

- Turn the power supply settings to zero, turn off mains supply and disconnect the power leads.
- Visualise the run progression or final separation on a UV transilluminator.
- At the end of the run rinse the apparatus with DISTILLED WATER ONLY.
- IMPORTANT: Acrylic plastic is NOT resistant to aromatic or halogenated hydrocarbons, ketones, esters, alcohol's (over 25%) and acids (over 25%), they will cause "crazing" especially of the UV transparent plastic and should NOT be used for cleaning. DO NOT use abrasive creams or scourers. Dry components with clean tissues prior to use.
- Ensure that the connectors are clean and dry before usage or storage.

Operational:

Model	Normal Operating Voltage (Volts)	Normal Operating Current (mAmps)	Gel Vol. for a 5mm gel (mls)	Approx. Buffer Volume (mls)	Electrode Separation (mm)
Mini Z33,879-6	100	75	22.5	325	130
Midi Z33,881-8	150	100	100	900	190
Maxi Z33,882-6	250	200	200	2200	340
Cooled Maxi Z33,883-4	250	200	200	1500	340
Maxi-Plus Z33,884-2	300	250	375	3000	370
Cooled Maxi Plus Z33,885-0	300	250	375	2000	370

Preparation of Agarose Gels

The amount of agarose needed to give a particular % gel needs to be calculated; for example a 0.8% gel can be made by dissolving 0.8 grams of agarose powder in 100 mls of running buffer. The type of running buffer used should always be the same for the gel as that used in the buffer tank. The agarose needs to be fully dissolved before the gel can properly form. This can be achieved by heating with swirling in a water bath or incubator set to 70°C or by heating on a magnetic heating block with a magnetic stirring bar inserted. The flask should always be covered to prevent evaporation of the buffer and a higher concentration gel resulting. These methods may take longer than 1 hour for the agarose to fully dissolve. Alternatively, the agarose can be dissolved in about 5 - 10 minutes using a microwave oven. The agarose solution should be covered and the microwave set to low. The agarose dissolves better if the microwave is periodically stopped and the solution swirled. Before pouring, the agarose solution should be checked for undissolved agarose crystals which can affect the mobility characteristics of gels. If these are present, agarose dissolving should be continued. The agarose solution should be cooled to 50-60°C before pouring. If poured at too hot a temperature, the gel will be more likely to leak and also the comb may become distorted.

Agarose Gel Electrophoresis

DNA mobility DNA fragments as small as 1 kb or less can be separated using agarose gel electrophoresis. For fragments smaller than 0.1 kb, polyacrylamide gels are more suited.

RNA mobility Either before or during electrophoresis, RNA should be denatured. For example,

- RNA fragments which have denatured with glyoxal and dimethyl sulphoxide can be separated on neutral agarose gels, or
- RNA can be fractionated on agarose gels containing methylmercuric hydroxide or formaldehyde.

RNA samples usually require longer runs or buffers that are easily depleted, so it is necessary to circulate the buffer. Northern analyses should not normally be run on a minigel tank.

Separation Performance

Gel concentration, running buffer, voltage, temperature, conformation, and the presence of ethidium bromide all affect separation results.

Gel Concentration Selection. The range of fragment sizes to be separated will determine the choice of agarose concentration for a gel. Typical agarose concentration is 0.5% to 3.0%. For large DNA fragments low-percentage gels are required, while for small DNA fragments, high-percentage gels are recommended. Weak gels (<0.5% agarose) should be electrophoresed at low temperatures (eg ~4°C). Agarose gels of 0.75% to 1.0%, for routine electrophoresis, are recommended for a wide range of separations (0.15 to 15 kb). 2 - 4% agarose gels are usually selected for PCR fragment resolution.

If the gel has to be subsequently photographed, thin gels (2- to 3-mm) with low-percentage agarose are better than thick or high-percentage gels. The latter produce increased opaqueness and autofluorescence.

Table A offers suggested agarose concentration for separating various fragment sizes. Additionally, resolution ranges can be extended by using special agaroses.

Agarose (%)	Effective Resolution of linear DNA fragments (kb)		
0.5	**30**	→	**1.0**
0.7	**12**	→	**0.8**
1.0	**10**	→	**0.5**
1.2	**7**	→	**0.4**
1.5	**3**	→	**0.3**
2.0	**3**	→	**0.2**
3.0	**3**	→	**0.1**

Electrophoresis Buffer Selection TAE buffer provides optimal resolution of fragments >4 kb in length, while for 0.1- to 3-kb fragments, TBE buffer should be selected. TBE has both a higher buffering capacity and lower conductivity than TAE and therefore should be used for high-voltage electrophoresis. Additionally, TBE buffer generates less heat than TAE at an equivalent voltage and does not allow a significant pH drift.

Note: Because of its lower buffering capacity, TAE should be circulated or mixed from time to time for full-length electrophoresis, especially at higher voltages.

Temperature: Electrophoresis at high voltages produces heat. Additionally, high-conductivity buffers such as TAE generate more heat than low-conductivity buffers. Care should be taken in agarose gel electrophoresis with voltages greater than 175 V, as heat buildup can generate gel artifacts such as S-shaped migration fronts, and in extended electrophoresis runs, can even melt the agarose gel. With high voltage electrophoresis, the use of low-melting-point agarose gels should be avoided.

DNA Visualisation

To establish progress of double-stranded DNA , ethidium bromide (0.5 µg/ml) is often added to running buffer. The dye's fluorescence properties allows the band to be visualised under a UV lamp. However, ethidium bromide may slow the DNA migration rate by approx 15%. As an alternative, after electrophoresis, the gel may be stained in an ethidium bromide solution (0.5 µg/ml H_2O) for 15 to 60 minutes and then viewed or photographed on a UV transilluminator. Note: Staining time should be minimised to prevent small nucleic acid fragments from diffusing out of the gel.

Background fluorescence of unbound ethidium bromide can be minimised through destaining by soaking the gel for 5 minutes in 0.01M $MgCl_2$, or for 30 minutes in de-ionised water.

Caution! Ethidium bromide is a known mutagen. Always wear gloves when handling. Wear UV safety goggles and protect skin when using any UV light source.

The Use of Multiple Combs.

All SIGMA-ALDRICH systems allow the use of multiple combs. This facility greatly increases the number of samples of "mini-prep" plasmid DNAs that can be screened. By using the bottom row of wells on the gel, quantitative standards may be included for Southern blot hybridisation.

Note: Standards should be added to the bottom row and allowed to migrate into the gel for a few minutes before electrophoresis is complete.

Troubleshooting Guide

Most problems can be avoided by reading and following the instructions in this operating manual. Below we list some of those most commonly experienced along with suggestions for solving them. If however, these should not resolve the issue, or if you have questions not covered below, please contact your local SIGMA-ALDRICH sales office.

Equipment Problem	**Comments**
No bubbles appear at the electrodes when operating voltage is applied	Ensure that the DC power supply is properly connected.
Melted agarose leaks when casting.	Ensure tape is pressed firmly down on the tray and has formed a tight seal
	Ensure the agarose is not too hot when poured
	When using Casting Gates, ensure that the sealing surfaces of the running tray and the gel casting gates are clean. Ensure that the ends of the running tray are flat and free of nicks.
Electrophoresis Problem	**Comments**
Sample well deformed	Allow the gel to set for a minimum of 30 minutes.
	Leave comb in position until gel returns to room temperature before removing.
	Remove the comb both slowly and at a slight angle to prevent gel from breaking
	Avoid damaging the well with the pipette when loading the sample; aim for the centre of the well and avoid damaging the bottom of the well with the pipette tip.
Samples leak underneath the gel upon Loading	The bottom of the wells were torn when the comb was removed. To avoid this tearing, carefully wiggle the comb to free the teeth from the gel.
Samples do not run straight	Comb may be warped - should be replaced.
	Running tray may be warped-should be replaced. Reduce the voltage.
	Choose a buffer with suitable ionic strength and buffering capacity.
“smiling” along one edge of the gel	Gel was not level when cast or run - use the SIGMA-ALDRICH Gel Levelling Table Cat. No: Z33,955-5 level to ensure that the apparatus is level prior to gel casting and electrophoresis.

Bromophenol Blue dye turns yellow (pH change)	Check pH of buffer during electrophoresis. Ensure Tris base and not Tris-HCI was used. Mix the buffer periodically during electrophoresis. Connect a pump to circulate the buffer.
Double-banded pattern	Ensure the comb is vertical during casting so that the well shape is not distorted.
	Decrease the buffer level to 1mm above the top of the gel. This will reduce the temperature gradient through the gel.
	Increase concentration of the sample and use a thin (2 to 3mm) gel with a thin (1mm) comb.
"Tailed" bands (excessive fluorescence appearing above the band).	Reduce DNA in the sample. Reduce the protein and/or glycerol in the sample.
Poor band resolution	Add Ficoll, glycerol, or sucrose to the sample loading buffer to ensure that the sample layers on the bottom of the well. Ensure sample is completely dissolved.
	Reduce voltage, sample concentration, or sample volume.
	Ensure there is at least 1 mm of gel below the bottom of the comb to prevent samples from leaking out the bottom of the well.
	Reduce salt concentration of the sample. High salt concentrations can cause 'pinched' lanes, smeared lanes, arched dye front and slow migration.
	Check enzyme activity; may require longer digestion or different restriction buffer.
	Prepare fresh sample if nuclease contamination is suspected
	Choose agarose with low endosmosis value.
Gel melts or softens near sample wells.	Caused by a combination of pH drift and high temperature. Circulate or remix buffer periodically or reduce the voltage.

References:

1. **Maniatis, T., Fritsch, E. F. and Sambrook, J.** (1982) Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York.

2. **Rickwood, D. and Hames, B. D. (eds.)** (1982) Gel Electrophoresis of Nucleic Acids: A Practical Approach, IRL Press, Oxford, England.

3. **Longo, M. C. and Hartley, J. L**. (1986) Focus 8:3, 3.

4. **Ausubel, et al., (eds).** (1993) Current Protocols in Molecular Biology. Greene Publishing and Wiley-Interscience, New York.

F. Comb Specifications:

Model	Thickness (mm)	No. of Samples	Tooth Width (mm)	Tooth Spacing (mm)	Max Sample Vol. per well for a 5mm deep gel (µl)
Mini (Z33,879-6)					
Z33,886-9	1	4	10.25	3	45
Z33,887-7	1	8	4.5	2	20
Z33,888-5	1	12	2.5	2	11
Z33,889-3	1	16	2.2	1	10
Z33,890-7	1.5	4	10.25	3	70
Z33,891-5	1.5	8	4.5	2	30
Z33,892-3	1.5	12	2.5	2	17
Z33,893-1	1.5	16	2.2	1	15
Z33,895-8	2	4	10.25	3	90
Z33,896-6	2	8	4.5	2	40
Z33,897-4	2	12	2.5	2	22
Z33,898-2	2	16	2.2	1	20
Midi (Z33,881-8)					
Z33,906-7	1	10	9.5	2.5	40
Z33,907-5	1	12	8	2	35
Z33,908-3	1	16	5.5	2	25
Z33,909-1	1	20	4	2	17
Z33,910-5	1	24	3	2	13
Z33,911-3	1	28	3	1.5	13
Z33,912-1	1.5	10	9.5	2.5	60
Z33,914-8	1.5	12	8	2	50
Z33,915-6	1.5	16	5.5	2	35
Z33,916-4	1.5	20	4	2	25
Z33,917-2	1.5	24	3	2	20
Z33,918-0	1.5	28	3	1.5	20
Z33,919-9	2	10	9.5	2.5	85
Z33,920-2	2	12	8	2	70
Z33,921-0	2	16	5.5	2	50
Z33,922-9	2	20	4	2	35
Z33,923-7	2	24	3	2	25
Z33,924-5	2	28	3	1.5	25
Maxi and Cooled Maxi (Z33,882-6 & Z33,883-4)					
Z33,932-6	1	16	8.5	3	35
Z33,933-4	1	20	7	2	30
Z33,934-2	1	28	4.8	2	20
Z33,935-0	1	40	2.75	2	13
Z33,936-9	1.5	16	8.5	3	55
Z33,937-7	1.5	20	7	2	45
Z33,938-5	1.5	28	4.8	2	30
Z33,939-3	1.5	40	2.75	2	19
Z33,940-7	2	16	8.5	3	75
Z33,941-5	2	20	7	2	60
Z33,942-3	2	28	4.8	2	40
Z33,943-1	2	40	2.75	2	25

Model	Thickness (mm)	No. of Samples	Tooth Width (mm)	Tooth Spacing (mm)	Max Sample Vol. (µl) per well for a 5mm deep gel
Maxi-Plus and Cooled Maxi-Plus (Z33,884-2 & Z33,885-0)					
Z33,947-4	1	26	7	2	30
Z33,948-2	1	52	3	1.5	13
Z33,949-0	1.5	26	7	2	45
Z33,950-4	1.5	52	3	1.5	20
Z33,951-2	2	26	7	2	60
Z33,952-0	2	52	3	1.5	25

G. Gel casting trays:

The Mini unit is supplied with slotted gel casting trays and Aluminium casting gates. The Midi, Maxi and Maxi-plus units are supplied with standard form gel casting trays, which require gel sealing tape to cast gels.

Standard form gel casting trays are available for the Mini unit as an optional extra.

A short form (10cm long) gel casting tray or slotted gel casting trays and Aluminium gates are available for the Midi unit as optional extras.

Users may find it convenient to purchase additional trays of their choice, so as to:

- obtain their preferred casting method and gel length (Mini and Midi units)
- replace discoloured, damaged or contaminated casting trays
- use additional trays to cast new gels whilst running a gel in the electrophoresis unit.

For Mini unit (Z33,879-6)

Z33,901-6 Gel casting tray, 6 x 7cm, slotted, with Aluminium gates *
Z33,902-4 Gel casting tray, 6 x 10cm, slotted, with Aluminium gates *
Z33,903-2 Replacement Aluminium gates for 6cm gel tray
Z33,899-0 Gel casting tray, 6 x 7cm, standard form
Z33,900-8 Gel casting tray, 6 x 0cm, standard form

For Midi Unit (Z33,881-8)

Z33,926-1 Gel casting tray, 13 x 10cm, slotted, with Aluminium gates
Z34,045-6 Gel casting tray, 13 x 15cm, slotted, with Aluminium gates
Z33,928-8 Replacement Aluminium gates for 13cm gel tray
Z33,925-3 Gel casting tray, 13 x 10cm, standard form *
Z34,044-8 Gel casting tray, 13 x 15cm, standard form

For Maxi units (Z33,882-6 & Z33,883-4)

Z33,946-6 Gel casting tray, 20 x 20cm, standard form *

For Maxi-Plus units (Z33,884-2 & Z33,885-0)

Z33,953-9 Gel casting tray, 25 x 30cm, standard form *

All dimensions shown above are dimensions of the gel.Items marked * are included with the unit indicated.

QUALITY CHECK LIST

Model..... Serial Number.....

1. Tank Leak Tested Check.....
2. Electrode Conductivity Test Check.....
3. Labels Positioned Check.....
4. Labels Test/Serial No. Check.....
5. Unit Scratch/Blemish Free Check.....
6. Accessories - See Packing List Check.....
7. Instructions Check.....

ALL SIGMA PRODUCTS ARE SUPPLIED HAVING PASSED RIGOROUS QUALITY CONTROL PROCEDURES.
IF HOWEVER, YOU HAVE A QUERY, PLEASE CONTACT YOUR LOCAL SIGMA-ALDRICH SALES OFFICE FOR TECHNICAL SUPPORT.

SIGNED.....

QUALITY CONTROL ASSESSOR

WARRANTY

SIGMA-ALDRICH guarantees that the unit you have received has been thoroughly tested and meets its published specification.

This unit (excluding all accessories) is warranted against defective material and workmanship for a period of twelve (12) months from the date of shipment ex factory.

SIGMA-ALDRICH will repair all defective equipment returned during the warranty period without charge, provided the equipment has been used under normal laboratory conditions and in accordance with the operating limitations and maintenance procedures outlined in this instruction manual and when not having been subject to accident, alteration, misuse or abuse.

No liability is accepted for loss or damage arising from the incorrect use of this unit. SIGMA-ALDRICH's liability is to the repair or replacement of the unit or refund of the purchase price, at SIGMA-ALDRICH's option. SIGMA-ALDRICH is not liable for any consequential damages.

SIGMA-ALDRICH reserves the right to alter the specification of its products without prior notice. This will enable us to implement developments as soon as they arise.

SIGMA-ALDRICH products are for research use only.

A return authorisation must be obtained from SIGMA-ALDRICH before returning any product for warranty repair on a freight-prepaid basis.

WARNING

DO NOT attempt to remove the outer casing or make repairs to our electrical range of products, should any unit fail.
Contact SIGMA-ALDRICH immediately if the need for repair or servicing should arise.

See back cover for contact details of your local SIGMA-ALDRICH office

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