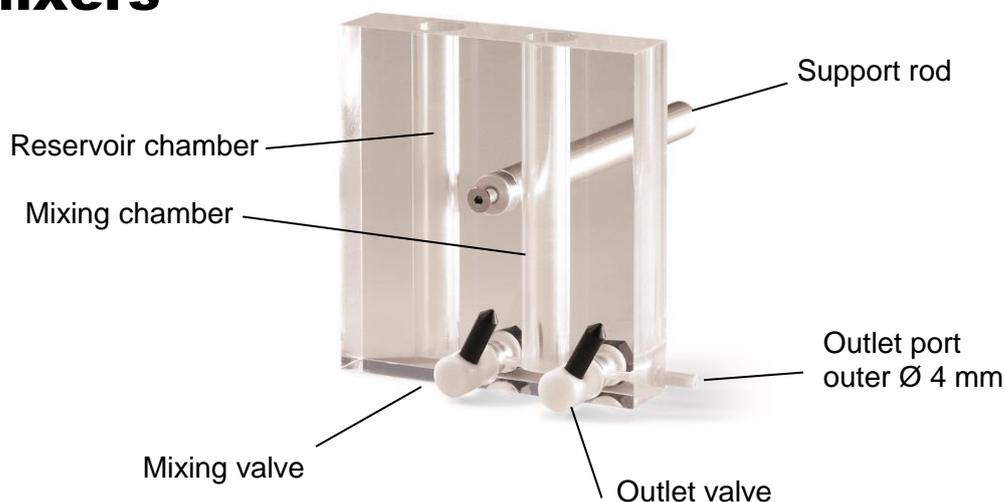


# Instructions for use



## Gradient Mixers

**N857.1**  
**N858.1**



**WARNING:**  
Please read the entire operator's manual thoroughly before operating this unit.

Our units comply with the statutory CE safety directives

Our gradient mixers are designed to give long service and reproducible results in your laboratory. Please take a few minutes to read these instructions.

First check that the apparatus has been received complete and undamaged following shipment. Refer to the packing list and check that all components and accessories are present. Any faults or losses must be notified to us immediately.

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

### 1. PACKING LISTS

No. Items	Description	Part Number
1	Gradient Mixer MINI – 30 ml	<b>N857.1</b>
1	Manual	
1	Gradient Mixer MIDI – 100 ml	<b>N857.2</b>
1	Manual	

We recommend using the peristaltic pump Sci-Q 323 (Art. No. Y545.1) and of ROTILABO®-FEP tubes with an inner diameter of 4 mm (Art. No. C024.1).

## 2. SPECIFICATIONS

### A. Construction

- Rugged acrylic construction.
- All acrylic joints chemically bonded.
- Easy to use valve system.
- Clamping bar for stability.

### B. Environmental Conditions

- This apparatus is intended for indoor use only.
- This apparatus can be operated safely at an altitude of 2.000 m.
- The normal operating temperature range is between 4 °C and 65 °C.
- Maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C.

## 3. USING THE GRADIENT MIXING UNITS

### A. Introduction

We offer engineered out of single acrylic blocks four sizes of linear gradient mixers in two sizes (30 ml, 100 ml). These gradient mixers are used for preparation of linear gradients of hydrophilic solutions, like, for instance, polyacrylamide gradient gels, or density gradients for centrifugation (sucrose- or cesium chloride gradients).

These mixers contain two chambers, a reservoir chamber and a mixing chamber. These two chambers are connected via a stopcock valve. A piece of tubing connected to the side outlet from the mixing chamber, passes through a peristaltic pump for delivery of the gradient mixture.

All of these gradient mixers generate linear gradients by the same method. Equal volumes of solutions are placed into the two reservoirs, with the stopcock valve closed. The gradient mixer is placed on a magnetic stirrer and a stirring bar is placed in the mixing chamber. The tubing is connected to the outlet of the mixing chamber, passes through a peristaltic pump. When the interconnecting stopcock valve is opened, solution flows from the reservoir chamber into the mixing chamber at the same rate as the gradient mixture is poured via the peristaltic pump. The solution in the mixing chamber is kept at equilibrium by constant stirring. The levels of solution in both chambers fall at the same rate.

When the gradient is being poured from the bottom, the high concentration solution is placed in the reservoir chamber and the low concentration solution in the mixing chamber. The low concentration solution enters the receptacle first and is pushed up by the high concentration solution.

When the gradient is being poured from the top, the high concentration solution is placed in the mixing chamber and the low concentration solution placed in the reservoir chamber. The high concentration solution enters the receptacle first and is then overlaid with that of lower concentration.

### B. Safety Precautions

1. READ the instructions before using the apparatus.
2. Acrylamide is a volatile, cumulative neurotoxin and suspected carcinogen. Wear effective protective clothing and follow recommended handling and disposal procedures.
3. Polymerised gels contain some unpolymerised monomer. Handle with gloves only.

### C. Cleaning

1. Rinse all the components of the gradient mixer with DISTILLED WATER ONLY.  
**IMPORTANT:** Acrylic plastic is NOT resistant to aromatic or halogenated hydrocarbons, ketones, esters, alcohols (over 25 %) or acids (over 25 %). NEVER USE ORGANIC SOLVENTS. Dry the mixers with tissues.
2. Clean the gel plates, spacers and combs in a mild laboratory detergent. DO NOT use abrasive creams or scourers. If a particularly clean finish is required (e.g. for silver stained gels) the glass plates can be soaked in chromic acid overnight, rinse with water then wipe successively with ethanol, acetone and then ethanol again.
3. The notched glass plates can be siliconised in a fume hood with Dimethyldichlorosilane if required to assist in plate separation after the electrophoresis run.
4. Handle the clean plates with gloved hands (remove any fingerprints with acetone).

### D. Assembly

For gradients being poured from the bottom.

For gradients being poured from the top, exchange solutions in reservoir and mixing chambers (see above).

1. Set up the gradient receptacle. For a sucrose gradient clamp a centrifuge tube in an upright position.
2. Place a piece of tubing to the outlet port of the mixing chamber. Pass the tubing through a peristaltic pump. A flow rate of 5 ml per minute is sufficient. Fix the other end of the tubing to the bottom of the centrifuge tube.
3. Place the gradient mixer on a magnetic stirrer and make sure the unit is level. Place a magnetic stirring bar in the mixing chamber.
4. Close the stopcock valve between the reservoir chamber and the mixing chamber. Prepare the two starting solutions.
5. Add the concentrated solution to the reservoir chamber. Fill the mixing valve with this solution by opening the valve, allowing the tube in it to fill, and then closing the valve.
6. Add the dilute solution to the mixing chamber and start the magnetic stirrer.
7. Open the outlet port on the mixing chamber (outlet valve) and at the same time start the peristaltic pump. Open the connecting valve between the two chambers.
8. Allow all of the solution in the mixing chamber to empty before turning off the peristaltic pump.
9. Remove the tube carefully from the centrifuge tube.
10. For polyacrylamide gels: Allow the acrylamide solution to polymerise for at least one hour before dismantling the gels from the multicasting unit.

<b>Gradient Mixer MINI</b>	<b>Whole volume 30 ml</b>	<b>1 piece</b>	<b>N857.1</b>
<b>Gradient Mixer MIDI</b>	<b>Whole volume 100 ml</b>	<b>1 piece</b>	<b>N858.1</b>

#### Carl Roth GmbH + Co. KG

Schoemperlenstraße 3-5 • 76185 Karlsruhe  
P.O. Box 100121 • 76231 Karlsruhe  
Phone: +49 (0) 721/ 5606-0  
Fax: +49 (0) 721/ 5606-149  
info@carlroth.com • www.carlroth.com

gh 02/2021

The company is a limited partnership with headquarters in Karlsruhe, reg. court Mannheim HRA 100055. Roth Chemie GmbH, with headquarters in Karlsruhe, reg. court Mannheim HRB 100428, is the personally liable partner. Chairman of the Board: Eberhard Gaul; Managing Director: André Houdelet. Sales tax identification number: DE 143621073.