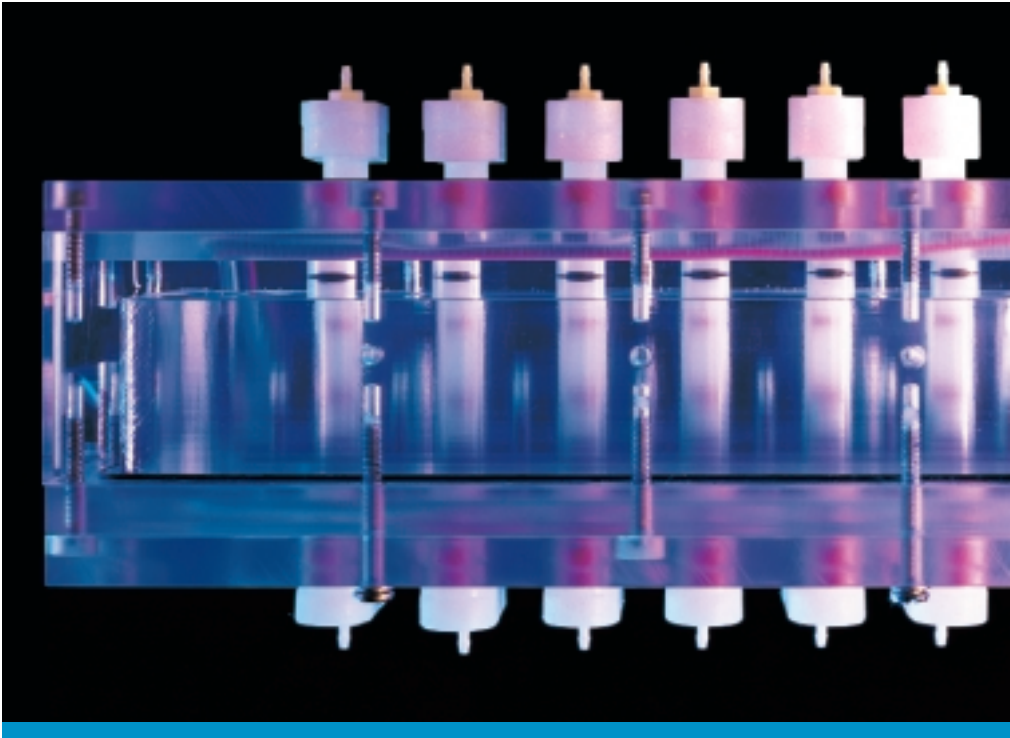


SUPRAFUSION SYSTEMS

Suprafusion 1000

Suprafusion 2500



Brandel Suprafusion Systems represent the most complete, versatile and efficient means of in vitro chemical and electrical stimulation of multiple tissue samples, permitting up to 20 conditions to be explored per sample.

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WHY SUPRAFUSION?

The perfusion technique offers several distinct advantages over traditional binding protocols by stimulating the extracellular environment using buffers and gasses that continuously flow past tissue sections. With perfusion, changes in multiple conditions such as pH, ions and gasses, can be assessed as they occur to a single tissue, while other techniques permit assessment of only one condition per tube.

Used in conjunction with other receptor binding protocols, perfusion can be used to fully evaluate secondary events such as neurotransmitter release and secondary messenger events.

AUTOMATED, MULTI-CHANNEL PERFUSION

By automating the process, Brandel Suprafusion Systems make it possible to conduct more extensive studies while maintaining consistent procedure.

With their patented, multi-channel designs, Brandel Suprafusion Systems can simultaneously perfuse each of 6, 12, 18 or 20 tissues with 6-9 different reagents — in any sequence you choose — and collect up to 20 effluents per tissue. From start to finish, each channel is entirely isolated from the others and automatic indexing facilitates sequential collection of effluents

Your choice of adjustable flow rates, selection of reagents, timing, and order of events enable you to perform tests according to your specific requirements — and options add even greater flexibility to the systems.

ADDITIONAL CAPABILITIES

In addition to standard chemical stimulation, Brandel Suprafusion systems offer optional electrical stimulation with the ES-200 Series Multi-Channel Electrical Stimulators and platinum-screened electrical probes. Other options include environmental and temperature controls, and special Luer Lock fittings for injecting chemical stimulants before the reaction chambers for direct dose response.

Models are also available for perfusing larger tissue samples or performing other tests in well-plates, and select components are available for special in-house applications.

TISSUE CHAMBER VOLUMES

Typical sizes shown. All tissue chambers 6.35 mm diameter.
Volume of 0.3 ml is standard; other sizes available upon request.

Volume	0.60 ml	0.50 ml	0.40 ml
Height	19.00 mm	15.85 mm	12.70 mm
Volume	0.30 ml	0.20 ml	0.10 ml
Height	9.50 mm	6.35 mm	3.17 mm

SUPRAFUSION1000: SEMI-AUTOMATED PERFUSION

SUPRAFUSION1000 is available in 6 and 12-channel models, both perfusing each tissue with up to 6 reagents each and collecting up to 20 effluents per sample. From reagent to effluent, each channel is completely isolated from the others. Manually adjustable flow rates, selection of reagents, and timing enable tests to be performed according to your parameters.

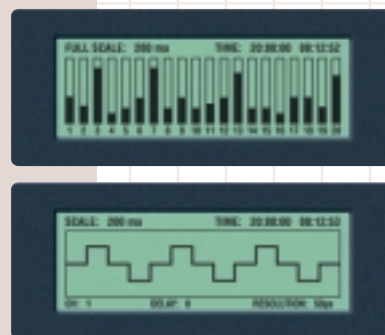
SUPRAFUSION1000 features automatic indexing for sequential collection of effluents and includes non-conductive reaction probes with standard 0.30 ml reaction chambers (other sizes on request). Also standard are provisions for prepassing reagents with one or two gasses. Simply connect your source.

VERSAFLOW™ PERISTALTIC PUMPS

All Suprafusion systems include Brandel's Versaflo™ multi-channel peristaltic pump. Designed for Suprafusion, Versaflo pumps are remarkably accurate, with a flow variance of $\pm 0.5\%$ across all channels. Overall flow rate and volumes of individual channels are adjustable. Versaflo pumps are self-priming, reversible, and can accommodate different sized tubing.

ELECTRICAL STIMULATION

In addition to chemical stimulation, Brandel offers optional electrical stimulation with the ES-200 Series Multi-Channel Electrical Stimulators and platinum-screened electrical probes. Designed and built by Brandel specifically for Suprafusion, the ES-200 Series delivers mono and biphasic, regulated current to each channel, over a range of 0-200 milliamps per channel. The selectable, front-panel display shows either a bar graph or digital scope of each channel's output.



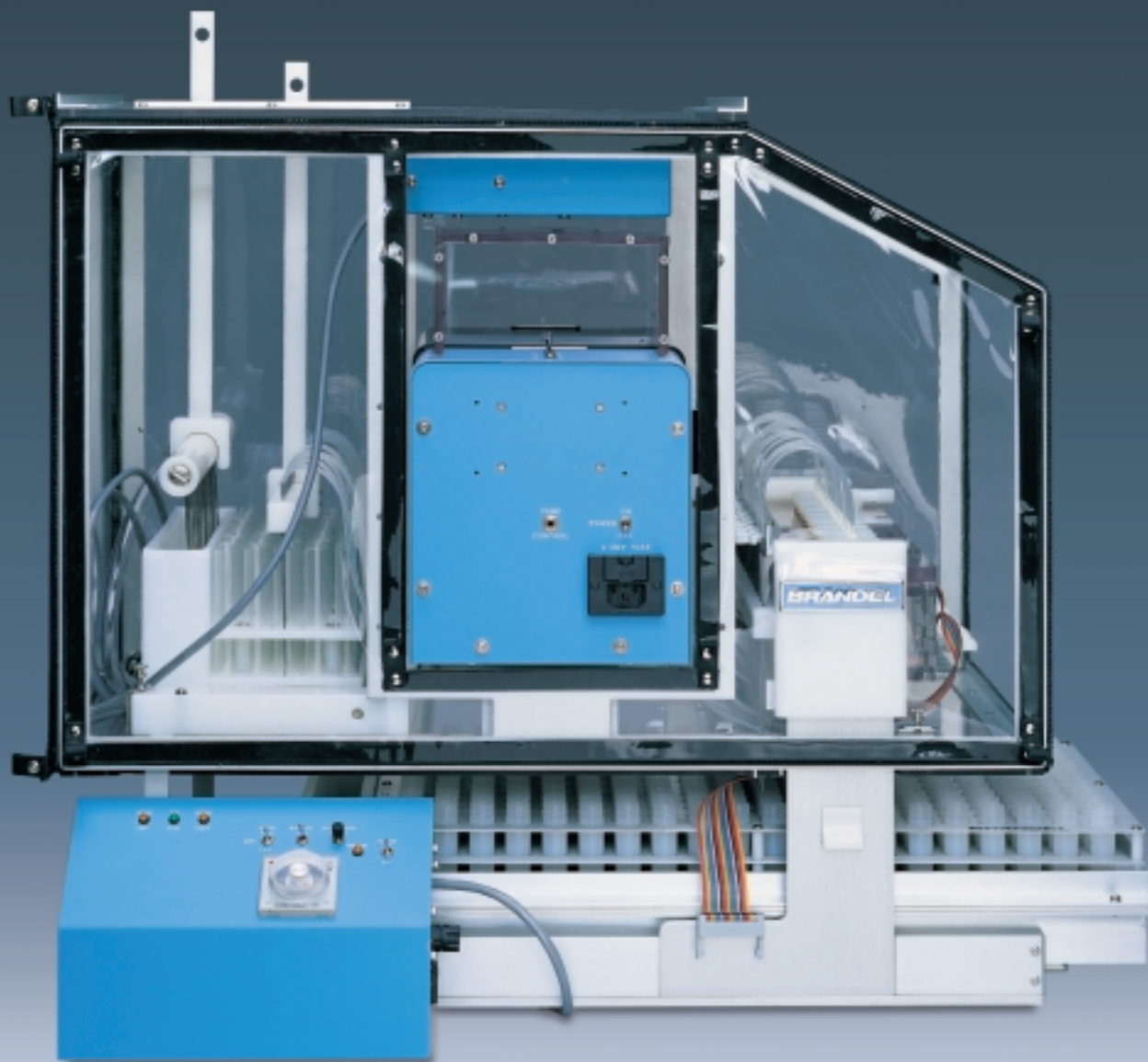
Unit can be programmed using the front keypad or by host computer via a standard RS-232 port. Whether you add electrical stimulation now or later, your Suprafusion chamber block is internally pre-wired.

SUPRAFUSION1000/2500 OPTIONS

LUER LOCK FITTINGS. Permit injection of chemical stimulants before the reaction chambers for direct dose response.

CIRCULATING WATER BATH. Thermostatic controls maintain constant temperature of the water-jacketed reaction chamber block.

COLLECTION VIAL ICE TRAY. Ice water bath cools vials and effluents.



Suprafusion1000 Series: SF-12 with Environmental Control System

REAGENT WATER BATH. Thermostatically-controlled, warm water bath regulates temperature of reagents before they are pumped through the system. Standard on 2500.

ENVIRONMENTAL CONTROL SYSTEM. Encloses entire delivery section, including reagents, peristaltic pump, reaction chamber block, and all tubing. The thermostatically-controlled warm-air blower can be manually adjusted, and all critical areas can be easily accessed through removable panels in the enclosure. Standard on SF-2506 and SF-2512.

OTHER MODELS. Models are also available for perfusing larger tissue samples as well as performing other tests in well-plates.

FILTERS, DISCS, TUBING, ETC. Brandel carries glass fibre filters, nylon and polyethylene discs for Suprafusion systems. Also available are various sizes of reaction chambers, tubing and collection racks. Please call with any special requirements.

SUPRAFUSION2500: FULLY-AUTOMATED PERFUSION SYSTEMS

SUPRAFUSION2500 features fully automatic, programmable control, simultaneously perfusing 6, 12, 18 or 20 tissues, collecting up to 20 effluents per sample. In addition, all models are now available for perfusing larger tissue samples as well as performing other tests in well-plates.

18 & 20-CHANNEL SYSTEMS

Twenty-channel systems perfuse tissues with up to 9 reagents each and collect effluents in standard 5 or 7ml vials in a generic collection tray.

Eighteen-channel models also perfuse tissues with up to 9 reagents each and are designed for use with your specific liquid scintillation counter — effluents are collected into vials pre-loaded into your counter's racks. Models are available for Beckman, LKB (Wallac) and Packard counters, with others on request.

6 & 12-CHANNEL SYSTEMS

Six and 12-channel models perfuse samples with up to 6 reagents each, collecting up to 20 effluents per sample in 5 or 7 ml vials. Six and 12-channel models include Environmental Control System as standard.

PROGRAMMING

All Suprafusion2500 Systems feature fully automated operation, with built-in hardware and software and the capacity to interface with a host computer.

STANDARD FEATURES & OPTIONS

Standard features include heated reagent water baths, high-performance Versaflo™ Peristaltic Pumps provisions for reagent gassing — virtually everything needed for chemical perfusion.

A variety of options are available for electrical stimulation, temperature and environmental control (see left).

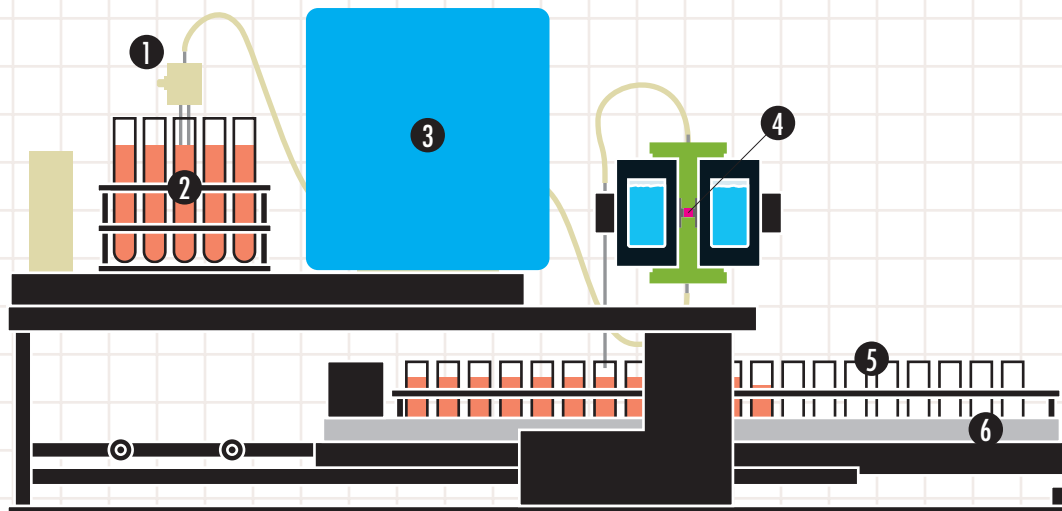


Suprafusion2500 Series: SF-2518B with Environmental Control System

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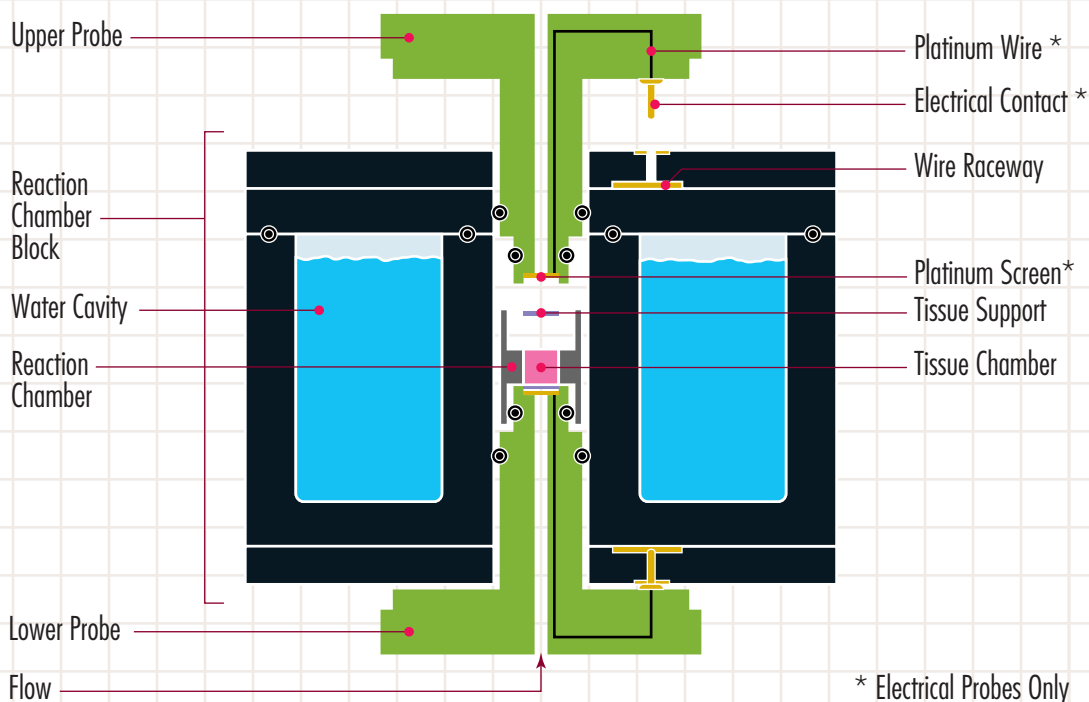
SUPRAFUSION: HOW IT WORKS

CHEMICAL PERFUSION SEQUENCE



- Reagents may be pre-gassed using Gassing/Reagent Probe (1).
- Reagents are drawn from test tubes (2) by Versaflo peristaltic pump (3) and continuously flow through Reaction Chambers (4) to stimulate tissue samples. Optional electrical stimulation or optional direct injection can also be performed at this time.
- Effluents are collected in Collection Vials (5).
- Collection rack (6) is automatically indexed to next row of vials according to user specifications and the process repeated with next reagent or buffer solution.

REACTION BLOCK, CHAMBER & PROBES DETAIL



SUPRAFUSION1000 MODELS & OPTIONS

6-Channel Standard Format System & Options

SF-06	Suprafusion2500, 6-channel System
CVT-106-†	Additional Collection Vial Tray
CWT-106-†	Collection Vial Ice Tray
CWB-100	Circulating Water Bath
RWB-106	Reagent Water Bath, heated
ECS-106	Environmental Control System
LER-106	Luer Lock Fittings, for direct injection before reaction chambers
SF-0S-06	Perfusion System for 6-well Plates
ES2-069-55	Electrical Stimulator, 6-channel; Includes 6 sets of Electrical Probes

† Please specify the outside diameter of your vials in millimeters

12-Channel Standard Format System & Options

SF-12	Suprafusion2500, 12-channel System
CVT-112-†	Additional Collection Vial Tray
CWT-112-†	Collection Vial Ice Tray
CWB-100	Circulating Water Bath
RWB-112	Reagent Water Bath, heated
ECS-112	Environmental Control System
LER-112	Luer Lock Fittings; for direct injection before reaction chambers
SF-0S-12	Perfusion System for Well Plates
ES2-129-55	Electrical Stimulator, 12-channel; Includes 12 sets of Electrical Probes

† Please specify the outside diameter of your vials in millimeters

SUPRAFUSION 1000 STANDARD FEATURES

- Collects 20 separate effluents per tissue sample
- Perfuses each sample with up to 6 different reagents
- 0.30ml Reaction Chamber Volume (other sizes on request)
- Non-conductive Reaction Probes
- Hi-performance, variable speed Versaflo™ Peristaltic Pump
- Water-Jacketed Reaction Chamber Block
- Provisions for Reagent Pre-Gassing (2)
- Semi-Automatic Indexing
- Collection Vial Tray for 5 or 7ml vials
- Reagent Rack for Test Tubes
- Fully isolated channels, from reagent through effluent
- Internally pre-wired for electrical stimulation (requires Electrical Stimulator w/ platinum-screened probes)
- One-year warranty & full factory support

SUPRAFUSION2500 MODELS & OPTIONS

6-Channel Systems & Options

SF-2506	Suprafusion2500, 6-channel System
CVT-106-†	Additional Collection Vial Tray
CWT-106-†	Collection Vial Ice Tray
CWB-100	Circulating Water Bath
Included	Reagent Water Bath, heated
Included	Environmental Control System
LER-106	Luer Lock Fittings; for direct injection before reaction chambers
SF-0S-06	Perfusion System for Well Plates
ES2-069-55	Electrical Stimulator, 6-channel; Includes 6 sets of Electrical Probes

† Please specify the outside diameter of your vials in millimeters

12-Channel Standard Format System & Options

SF-2512	Suprafusion2500, 12-channel System
CVT-112-†	Additional Collection Vial Tray
CWT-112-†	Collection Vial Ice Tray
CWB-100	Circulating Water Bath
Included	Reagent Water Bath, heated
Included	Environmental Control System
LER-112	Luer Lock Fittings; for direct injection before reaction chambers
SF-0S-12	Perfusion System for Well Plates
ES2-129-55	Electrical Stimulator, 12-channel; Includes 12 sets of Electrical Probes

† Please specify the outside diameter of your vials in millimeters

SUPRAFUSION 2500 STANDARD FEATURES

- Fully-automated operation, including programmable flow rates, selection of reagents, timing and order of events
- Collects 20 separate effluents per tissue sample
- Perfuses each sample with 9 different reagents (18 and 20-channel models) or 6 different reagents (6 and 12-channel models)
- Heated Reagent Water Bath included
- 6 and 12-channel models include Environmental Control System
- 0.30ml Reaction Chamber Volume (other sizes on request)
- Non-conductive Reaction Probes
- Hi-performance, variable speed Versaflo™ Peristaltic Pump
- Water-Jacketed Reaction Chamber Block
- Provisions for Reagent Pre-Gassing (2)

18-Channel Systems & Options

SF-2518*	Suprafusion2500, 18-channel System
CVT-118*	Additional Collection Vial Tray
CWT-118*	Collection Vial Ice Tray
CWB-100	Circulating Water Bath
Included	Reagent Water Bath, heated
ECS-118*	Environmental Control System
LER-118*	Luer Lock Fittings; for direct injection before reaction chambers
SF-0S-18*	Perfusion System for Well Plates
ES2-189-55	Electrical Stimulator, 18-channel; Includes 18 sets of Electrical Probes

* Insert the letter that matches your scintillation counter racks: B Beckman; P Packard; L LKB (Wallac)

20-Channel Standard Format System & Options

SF-2520	Suprafusion2500, 20-channel System
CVT-120-†	Additional Collection Vial Tray
CWT-120-†	Collection Vial Ice Tray
CWB-100	Circulating Water Bath
Included	Reagent Water Bath, heated
ECS-120	Environmental Control System
LER-120	Luer Lock Fittings; for direct injection before reaction chambers
SF-0S-20	Perfusion System for Well Plates
ES2-209-55	Electrical Stimulator, 20-channel; Includes 20 sets of Electrical Probes

† Please specify the outside diameter of your vials in millimeters

- Collection Vial Tray for 5 or 7ml vials
- Reagent Rack for Test Tubes
- Fully isolated channels, from reagent through effluent
- Internally pre-wired for electrical stimulation (requires Electrical Stimulator w/ platinum-screened probes)
- Operating software with Menu-driven Interface
- RS-232 interface for host computer
- Variable viewing angle on display
- Backlit LCD
- On 18 and 20-channel models, reaction block slides out of the way for ease of loading samples
- Two TTL Level signal ports
- Programmable, external pump port
- Two programmable AC outlets
- Two always-on accessory AC outlets
- One-year warranty & full factory support

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