

QFP 2L-700

High Pressure Laboratory Food Processing System



Features and benefits

High pressure (up to 100,000 psi, 690 MPa) inactivates food borne pathogens and spoilage microorganisms with little or no change in organoleptic properties and nutritional value of foods.

Water pressure medium for predictable replication into commercial applications

Precise computer-controlled test cycles with data acquisition for cycle analysis and comparisons

Pressure vessel with leak-before-break design and threadless closures

Full range of temperature and pressure parameters

Single bulkhead connection to utilities

High Pressure Processing (HPP) preserves a food's natural flavor, nutrients, and other sensory properties while extending the shelf life of foods through the inactivation of microorganisms. The uniform application of this non-thermal food processing technology also provides the food industry with new products and new product development opportunities that can fully exploit the functional properties of food ingredients such as hydrocolloids, proteins, etc.

Some of the successful food applications include dressings, sauces, salsas, packaged meats, seafood, cut fruit, purees, juices, chilled ready-to-serve desserts, soups, yogurt, nutraceuticals, pharmaceuticals and other food products.

The research food press 2L is an easy-to-use system designed specifically for basic research and feasibility testing. Each unit features safe, automatic operation, and is delivered fully tested and ready for bulkhead connection to customer utilities.

Experience in high pressure equipment

Avure Technologies has been active for decades in the design and manufacture of high pressure isostatic (equal on all sides) presses for research and production of advanced materials and high-performance industrial components. In addition to the 2L, Avure supplies high-volume high pressure processing (HPP) food processing equipment for large-scale production.



System Components

The Process Module is the main cabinet which contains the following subsystems:

Pressure Containment System

Vessel - dual-wall high pressure vessel with leak-before-break channel on liner, and non-threaded closures.

Frame - rail mounted yoke frame contains the axial force of the closures.

Closures and penetrations - threadless closures contain high pressure seals. Connection for pressure medium is located in the lower closure. Upper closure is equipped with an automatic vent for de-aeration of the vessel prior to a pressure cycle, and a thermocouple feed-through with two Type K thermocouples to monitor the sample temperature.

Closure lifting device - pneumatic lifting device inserts and removes the top cover during loading and unloading of the press.

Pumping System

The high pressure system, using an intensifier-based electrohydraulic pump, pressurizes the vessel, and is delivered as a functional unit complete with internal piping to the vessel and all required wiring.

Water Circulation System

A reservoir contains water that is pumped through a booster heater unit controlled by a temperature controller. Water is heated to a preset temperature, and is circulated in the water jacket of the pressure vessel by a pump. A heat exchanger is also installed to enable cooling of the pressure vessel.

Control Module

This desktop system allows for both automatic and manual operation. An IBM-compatible personal computer is supplied for programming operating modes, defining setpoints for pressure, temperature, and dwell periods, and recording of test conditions. Printout capability is included. There is also a desktop module with control switches, emergency stop button, and system status lights.

Operation

Pressure, temperature, and dwell time setpoints are entered into the automated control system. Food in sealed bags is placed in a stainless steel cylindrical work basket (supplied), and placed in the pressure vessel. After the vessel is closed, it is automatically filled with water, and the pressure cycle is initiated. After depressurization, the vessel is opened and the pressurized food is removed.

QFP 2L Technical Specifications

Maximum vessel pressure.....	100,000 psi (6,900 bar)
Inner vessel diameter.....	4.0 in (100 mm)
Inner vessel height at max. pressure.....	10.0 in (254 mm)
Maximum temperature.....	194°F (90°C)
Minimum temperature.....	50°F * (10°C) *

* Consult Avure for operation at lower temperatures.

Electrical power

Choice of.....	3 ph, 60 Hz, 440-480 VAC, 50 amps, 41.5 KVA
	3 ph, 50 Hz, 380 VAC, 60 amps, 41.5 KVA
	3 ph, 50 Hz, 220 VAC, 110 amps, 41.5 KVA
	3 ph, 60 Hz, 220 VAC, 110 amps, 41.5 KVA

Process module

Dimensions.....	54.0 in wide x 72.0 in deep x 58.0 in high (1372 x 1830 x 1473 mm)
Weight.....	4,000 lbs (1800 kg)

Control module

Dimensions.....	21.0 in wide x 12.0 in deep x 6.0 in high (534 x 305 x 153 mm)
Weight.....	33 lbs (15 kg)

Compressed air100 psi and 5 SCFM for valve actuation and top closure air cylinder

Plant water10 gpm (38 lpm); 86°F (30°C) maximum; 30 psi (2 bar) minimum

To learn more about ultra-high-pressure food technology for non-thermal food safety, shelf-life extension, and new product development, visit www.avure.com, or contact any of our Avure locations.



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Quality System Certified

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