



Model GW1020 Laboratory Glassware Washer

General Specifications

1.0 General Description

The Model GW1020 Laboratory Glassware Washer is a high capacity spray cabinet washer specifically designed to clean and sanitize laboratory glassware of all shapes and sizes as well as other items used in the laboratory environment. Several optional features are available, as well as many optional accessories to handle and wash many common laboratory items. The Model GW1020 incorporates a large number of “state-of-the-art” features to ensure thorough, efficient cleaning, as well as many features unique to our design. Plumbing design ensures no cross-contamination among wash and rinses.

2.0 Dimensions SIZE (Width” X Depth” X Height”)

| Chamber Size* | External Overall Size |
|----------------|-----------------------|
| 24" x 24" x 25 | 40" x 30" x 86" |

*Note: Dimensions are maximum chamber opening sizes. Actual Load size must be smaller to allow for clearances. Custom chamber sizes can be provided as required.

3.0 Models Available

| | Model | Door Style | Heating Type |
|-----|----------|------------|--------------|
| 3.1 | GW1020GS | Guillotine | Steam |
| 3.2 | GW1020GE | Guillotine | Electric |
| 3.3 | GW1020LS | Load Shelf | Steam |
| 3.4 | GW1020LE | Load Shelf | Electric |

4.0 Automatic Temperature Regulation

4.1 All models shall incorporate analog to digital temperature controls integral with the PLC. Sensors shall be type J thermocouples, connected directly to an analog module on the PLC. Temperatures shall be read directly from the operator's display.

4.2 Steam Heat

4.2.1 Heating system shall consist of a welded steam coil, produced in accordance with ASME section IX Unfired Pressure Vessel Code, complete with valves, strainer, condensate trap and all other necessary trim. Coil shall be easily removable for cleaning or repair.

4.3 Electric Heat

4.3.1 Heating system shall consist of submerged stainless steel-sheathed heating elements with contactor, short circuit and over-temperature protection and all other electrical appliances necessary in accordance with NEC and UL specifications.

5.0 Microprocessor Control

5.1 The treatment schedule and all other machine functions shall be controlled by a readily available, non-proprietary, industrial style modular programmable controller such as that manufactured by manufactured by Koyo and sold throughout the United States by PLC Direct.

5.2 Module replacement for the I/O system shall be easily accomplished with no tools and no wiring disconnection or connection.

5.3 The control system shall be programmed in simple ladder logic.

5.4 A text-based interface panel shall provide complete operator interface, diagnostic and programming capability. No special skills or knowledge shall be necessary to set up and control all machine functions.

5.6 Treatment schedules and cycle phase selections shall be programmable from the Panel. All timers in the program, as well as all cycle phase temperatures, shall be accessible and settable through the operator interface screen, with no necessity for the connection of either an auxiliary programming device or a modem/telephone line connection.

5.7 All controls shall be of industrial design and type, in order to resist the extreme environmental demands of the washroom. All electrical wiring, operator interface controls and circuits shall be protected in accordance with NEMA, UL and NEC standards.

6.0 Insulated Exterior

6.1 The exterior of the machine shall be fully insulated with 2" of rigid insulation covered by a Stainless Steel jacket for protection. This insulation shall be an integral part of the machine, designed to maintain the high temperatures required in the washing chamber and to limit radiation loss to the surrounding air.

7.0 Manuals & Documentation

7.1 A full set of manuals explaining machine operation and PLC operator controls shall be provided.

7.2 A complete list of purchased parts including original part numbers, where the parts were purchased, and the nearest local distributor where the parts can be purchased shall be provided as a standard part of the manual. All purchased machine components such as jets, valves, PLC modules, pneumatic system parts, etc., shall be entirely non-proprietary and available for purchase freely and widely through normal industrial supply outlets.

8.0 Machine Operation

8.1 Items to be cleaned shall be placed in or on the appropriate accessory rack or basket, which shall be placed inside the cabinet on the load rails by the operator. The door shall be closed and the pre-programmed treatment cycle phase options chosen. Treatment shall commence and continue automatically to the end of the cycle. Once the treatment cycle is complete, the operator shall open the door and remove the cleaned items.

8.2 All cycle phase selections and other cycle options shall be available for selection from the Operator Interface Panel. Machine memory shall allow storage of at least four(4) distinct cycles, to be recalled through simple screen selections.

8.3 Standard cycle phases shall include at least the following general treatment options:

8.3.1 Pre-rinse - Water retained in the sump from the last rinse shall be used to remove heavy soil, flushing any easily removed matter to drain in order to ensure that the detergent solution stays as clean as possible. Treatment shall be under pressure from the main treatment pump. This cycle phase shall be used to enhance the life of the detergent solution in a recycling situation and to increase the efficiency of the wash solution in all cases. At the end of this cycle phase, all solution shall be power drained.

8.3.2 Wash - Fresh hot water from the customer's supply shall be used to fill the sump, with detergent being introduced by dispenser or manually during filling. When the sump is full, heating shall begin in order to bring the wash solution up to the desired temperature. The wash treatment shall be under pressure from the main treatment pump. At the end of the wash cycle, detergent solution shall be flushed to drain.

8.3.3 Second Wash - If selected, shall be identical to first wash.

8.3.4 First Rinse - Fresh hot water from the customer's hot water supply shall be sprayed directly over all surfaces of the load. This water shall fall directly to the machine sump, where it shall be reserved for the next Prewash cycle. Sump water level shall be maintained automatically by the machine, power draining excess water as required.

8.3.5 Pure Water Rinse - If selected, Chemically Pure, RO or Distilled water from the holding tank shall be sprayed over all surfaces of the load, under pressure from the dedicated pure water pump.

8.3.5 Exhaust - When all wet cycle phase treatments are complete, the machine shall remain idle while any residual vapor in the cabinet shall be vented to the customer's air handling system. The time allowed for this ventilation shall be determined by experience with the specific application and subsequent adjustment of the user program through the operator touch screen, thus ensuring clement washroom conditions without wasting excess time with an idle machine.

30.0 Details of Construction

30.1 General

30.1.1 All wetted parts shall be of Type 304 Stainless Steel or appropriate polymeric materials.

30.1.2 All electrical assemblies, piping assemblies and mechanical apparatus shall be designed for, and be appropriate for use in, a high temperature sanitary wash-down environment. All components shall be selected for their ability to perform for long periods of time in the adverse and high production environment of the laboratory washroom. Each purchased part and each engineered part and sub-assembly shall be scrutinized and all specific design decisions shall be made in the light of these basic criteria.

30.1.3 All purchased components shall be un-modified, off-of-the-shelf items available to the owner in his locality, should he need them.

30.1.4 Original manufacturers' part numbers and descriptive information for all purchased parts shall be made an integral part of the service manual information provided at time of installation, and every effort shall be made throughout the life of the machine to assist the owner in acquiring any parts needed.

30.2 The door of the washer shall be of double-walled stainless steel construction, 1" thick, and filled with insulation. Door shall be equipped with 12" safety glass viewing window. Safety switch shall prevent operation of the machine if the door is opened.

30.2.1 Guillotine Door Door shall be a counterbalanced upward-raising door operated manually. Door shall be mounted in UHMW plastic guides for easy movement and positive seal.

30.2.2 Load Shelf Door Door shall be hinged at the bottom, and shall open outward to present a "load shelf" to the operator, thus allowing racked glassware to be rolled in and out of the cabinet easily.

30.3 Temperature shall be controlled directly by the PLC. Temperature sensor(s) shall be Type J Thermocouples, connected directly to the analog inputs of the PLC.

30.4 Water level shall be maintained by an electronic level control with removable and easily cleaned probes. Probes shall be removable for cleaning with no tools required, such as with a sanitary-type clamp fitting.

30.5 Washer programmable control shall provided by a modular industrial-type programmable logic controller, programmed in ladder logic and replaceable and programmable by the customer's own personnel if necessary. No proprietary control will be acceptable. All wiring and control shall be per National Electric Code and all devices utilized shall be UL, NEMA and/or IEC-rated. All operator controls or devices shall be of standard industrial NEMA-rated types, chosen for their ability to operate over the long haul in the tough and corrosive environment of the washroom.

30.6 MATERIALS OF CONSTRUCTION

| Item | Material |
|---|-------------------------------|
| base and sump | 14 gauge, 304 SS - #2B finish |
| door panels | 16 gauge, 304 SS - #3 finish |
| side and top panels | 14 gauge, 304 SS - #3 finish |
| recirculating piping | T304 SS |
| spray header and jets | T304 SS |
| recirculating pump housing and impeller | T304 SS |
| recirculating valves | T304 SS |
| external water piping | Copper |
| steam coils | Sch 40. 304 SS - #2B finish |
| Internal steam piping | T304SS |
| external steam piping | schedule 40 black iron |
| drain piping | T304 SS |

40.0 Available Accessories

40.1 Spindle Racks Spindle Racks shall be available in 64, 48, 24 and 12-spindle versions, for various sizes of wares. All spindle racks shall be constructed of T304 Stainless Steel and shall be complete with plastic-covered spindles and Acetal plastic rollers to interface with the machine load rails.

50.2 General Purpose Rotary Spray Rack - Rack shall be constructed of T304 Stainless Steel, complete with lower rotary spray header, wheels for interface with the machine load rails and holder for various inserts.

50.2.1 General Purpose Basket - Basket shall be a Stainless Steel wire form basket complete with semi-attached cover, for use with the GP Rotary Spray Rack, which will allow the processing of various irregularly shaped objects.

50.2.2 GP Multi-Pin Rack Insert - Insert shall be a Stainless Steel pin-type rack designed to hold small items in place when washing with the GP Rotary Rack.

50.2.3 Test Tube Basket - Basket shall be a Stainless Steel wire form basket allowing various sizes and heights of test tubes to be process in the GP Rotary Rack.

- 50.3 Pipette Rack - Rack shall be constructed of Stainless Steel, complete with Acetal Plastic rollers, and shall allow processing of multiple pipettes or similar items up to 14" in length.
- 50.4 Transfer Cart - Cart shall be constructed of Stainless Steel tubing, with caster wheels and with top rails which shall mate with the rollers of the accessory racks. Cart shall allow racked loads to be easily removed and/or loaded into the washer without lifting.

60.0 Utility Requirements

| | <u>Steam Heat</u> | <u>Electric Heat</u> |
|-------------------|---|---|
| Electrical | 208V, 3ph Wye, 60hz, 15 Amps | 208V, 3ph Wye, 60hz, 50 Amps |
| Steam | Min. 1/2 FPT 30-50 PSI 250#/Hr Max Flow | N/A |
| Condensate | 1/2 FPT | 1/2 FPT |
| Hot Water | 3/4 FPT, 35 PSI Dynamic 120-140 Deg. F. | 3/4 FPT, 35 PSI Dynamic 120-140 Deg. F. |
| Drain | 2 FPT | 2 FPT |
| Exhaust | 4" Dia. 100 SCFM | 4" Dia. 100 SCFM |

60.1 Notes to Utilities Table

- 60.1.1 A disconnect switch shall be installed by others than SMC in accordance with all NEC and local electrical codes.
- 60.1.2 Condensate shall be connected by others than SMC to a non-pressurized gravity main. The maximum condensate lift shall not exceed 15'.
- 60.1.3 Steam pressure shall not exceed 60 psi. Factory shall be consulted for steam pressures below 30 psi dynamic.
- 60.1.4 Hot water temperatures of less than 120 degrees F may impact treatment cycle times. Factory shall be consulted for recommendations if 120 degree F water is not available.
- 60.1.5 Drain shall be installed by others than SMC such that there is an air gap between the discharge point and the floor drain, or otherwise in strict accordance with local plumbing codes.

60.1.6 Exhaust connection shall be made by others than SMC using non-corroding materials, and all ductwork shall be sealed and pitched towards the machine. Any low points shall have individual drains lines installed. Effluent vapor may be 180 degree F, 100% saturated air.

70.0 Additional Engineering Information

| | |
|--------------------------------------|----------|
| Shipping Wgt. | 1800# |
| Dynamic Wgt. as Installed | 1650# |
| Sump Capacity | 17 Gals. |
| Heat Radiation | 500 btu |