STERIS®

# RELIANCE® 400
# LABORATORY GLASSWARE WASHER

## APPLICATION

The Reliance 400 Laboratory Glassware Washer is designed for thorough cleaning of laboratory glassware, plastic and metal goods used in research, production support and quality control laboratories.

## DESCRIPTION

The Reliance 400 Laboratory Glassware Washer is a cabinet-type washer equipped with an Eagle 3000 Stage 3 control system. The washer is preprogrammed with three adjustable cycles: light, medium and heavy. Seven additional cycles are available for customized programming to meet specific operating requirements. Pre-programmed descaling and priming cycles are also provided for routine maintenance.

Washer is built to seismic building code requirements and is available as a single- or double-door unit, for installation either as a freestanding unit or recessed through a barrier wall(s).

### Size (W x H x L)

Chamber load capacity:

- 26 x 25-1/2 x 26" (660 x 647 x 660 mm)

Overall dimensions:

- 42 x 80-3/4 x 32-1/2" (1067 x 2051 x 825 mm)

## STANDARDS

The Reliance 400 Glassware Washer meets the applicable requirements of the following standards, as certified by UL:

- **Underwriters Laboratories (UL)** Standard 61010-1.
- **Canadian Standards Association (CSA):** CAN/CSA-C22.2 No. 61010-1.
- **International Standard EN/IEC 61010-1.**
- **International Standard EN/IEC 61326.**
- **Governing Directive for the Affixing of the CE Mark:** Machinery Directive (98/37/EC).

(Typical only - some details may vary.)

- **Conformity to other applicable directives:** Electromagnetic Compatibility Directive (89/336/EEC) amended by Directive 91/263/EEC, Directive 92/31/EEC, and Directive 93/68/EEC; Low Voltage Directive 2006/95/EC.

## FEATURES

**Vertical sliding power door(s)** is constructed of tinted, tempered glass with stainless-steel trim, allowing the operator to view the chamber with door(s) closed. While cycle is in progress, glass remains cool to the touch. Power sliding door(s) operates automatically by pneumatic cylinders when the appropriate touch pad is pressed. The door is equipped with a safety switch to automatically retract (open) the door if obstruction is detected in the doorway. If power failure occurs, the door can be manually opened.

### The Selections Checked Below Apply To This Equipment

**MODEL**

☐ Steam-Heated Unit

**VOLTAGE**

- ☐ 120/208 Volt, 60 Hz, 3-Phase, 4-Wire
- ☐ 380/400/415 Volt, 50 Hz, 3-Phase, 3-Wire
- ☐ 480 Volt, 60 Hz, 3-Phase, 3-Wire
- ☐ 600 Volt, 60 Hz, 3-Phase, 3-Wire

☐ Electric-Heated Unit

**VOLTAGE**

- ☐ 380/400/415 Volt, 50 Hz, 3-Phase, 3-Wire
- ☐ 480 Volt, 60 Hz, 3-Phase, 3-Wire
- ☐ 600 Volt, 60 Hz, 3-Phase, 3-Wire

**POWER DOOR CONFIGURATION**

- ☐ Single Door
- ☐ Double Door (Pass-Through)

**OPTIONS**

- ☐ Non-Recirculated Heated Pure Water Rinse
- ☐ Non-Vented Vapor Condenser
- ☐ Drain Discharge Cool Down and Cold Water Pre-Wash
- ☐ Drying System
- ☐ Universal Shelving System

**ACCESSORIES***

- ☐ Additional (Maximum Two) Chemical Pump(s)
- ☐ Air Compressor
  - ☐ 110-115 Volt
  - ☐ 200-240 Volt
- ☐ Barrier Wall Flange Assembly

* *Refer to SD419 for material handling accessories*

Item _____

Location(s)_____

_____

Manual access handle is on the top edge of the door, behind the top service panel. If double power doors are ordered, a door interlock feature is provided to prevent contamination. The door interlock system allows only one door to be opened at a time, and prevents either door from being opened when the cycle is in progress, until STOP/RESET touch pad is pressed.

A **16-watt fluorescent light**, mounted within an explosion/ vaporproof enclosure, illuminates the wash chamber.

**Spray system** includes two manifold connectors positioned on the bottom of the chamber, and one rotary spray arm suspended from the top of the chamber. Manifold connectors automatically connect to accessory headers at the start of each cycle.

**Two removable stainless-steel debris screens**, located in the bottom of the wash chamber (sump), prevent large debris from entering the piping system and pump.

**Two adjustable peristaltic pumps** automatically dispense a selected amount of liquid chemicals (1/4 to 2.0 oz/U.S. gal [2.0 to 16 mL/L]) into the chamber sump during desired treatment. 50' (15 m) of tubing and electrical wiring, pick-up tubes and low level sensors for remote location of chemical containers are included.

**Water saver feature** allows the operator to retain water used during the final rinse treatment for reuse during the first treatment of the next cycle. Water can be retained only if no chemicals were used during the final rinse treatment and if optional drying was not selected. If retained water is too hot for reuse in first treatment of the next cycle, or if optional cold water pre-wash is selected, water will be automatically drained from the sump.

**Vapor removal fan** (1/15 HP, 50 W) is provided to remove vapor from the chamber throughout the cycle.

**Control panel**, with display window and touch pads, allows easy initiation, programming and monitoring of all cycle treatments. Display window features a 2-line x 20-character easy-to-read vacuum fluorescent display.

**Control system** includes three preprogrammed cycles to accommodate typical load and processing requirements. Control can retain in memory up to ten processing cycles, programmed and named according to Customer preferences. Once a cycle is started, the programmed cycle values are locked in and cannot be changed until cycle is complete.

Control system is equipped with a **Service Mode** for preventive maintenance testing and to facilitate troubleshooting. A built-in service diagnostic program is included to permit system calibration and verification of component operations. Control also includes **Cycle/Day Count Recall** system to remind operator when a complete preventive maintenance check is required.

**ProConnect™ Response Center** includes Remote Monitoring, Priority Technical Support and Equipment Performance Reports, as well as access to eservice.steris.com to schedule and track service requests and purchase service parts. Access to STERIS ProConnect Response Center is provided free during the warranty period as part of the equipment purchase. Available in North America only.

**Integral thermal printer** with automatic paper take-up provides an easy-to-read record of all pertinent cycle data. Printout includes cycle name, starting time and date of cycle, completion time of each treatment and a list of any cycle deviations that occurred. Any deviations in the cycle will set off visible and audible alarms for acknowledgment by the operator.

## CYCLE DESCRIPTION

The Reliance 400 Washer features 10 programmable cycles. Each cycle can be programmed to include up to 16 separate treatments. Possible standard treatments include: up to four pre-wash, up to four wash, up to four rinse and up to four pure water rinse treatments. Once a cycle is selected, the washer automatically processes the load through the programmed treatments.

The washer is programmed with three factory-set processing cycles: LIGHT, MEDIUM and HEAVY. All three factory-set cycles can be modified by the operator to include the following treatments:

- **PRE-WASH:** Load is sprayed with recirculated water at the selected temperature (hot or optional cold) for a selected amount of time (0-15 minutes). On completion of treatment, water is sent to drain.
- **WASH:** Load is sprayed with recirculated solution at the selected temperature (hot or heated, in the sump, to 190°F [88°C]) for the selected amount of time (0-15 minutes). A controlled amount of chemical detergent is automatically added to sump at the beginning of treatment. If heated water is selected, treatment will not start until selected temperature is reached. On completion of treatment, solution is sent to drain.
- **RINSE:** Load is sprayed with recirculated water at the selected temperature (optional cold, hot or heated, in the sump, to 190°F [88°C]) for the selected amount of time (0-15 minutes). If heated water is selected, treatment will not start until selected temperature is reached. On the completion of treatment, water is sent to drain.
- **PURE WATER RINSE:** Load is either sprayed with recirculated pure water at the selected temperature (ambient or heated, in the sump, to 190°F [88°C]) for a selected amount of time (0-15 minutes), or sprayed with non-recirculated pure water (supplied from optional storage tank) for 10 seconds. If heated water is selected, treatment will not start until the selected temperature is reached. On completion of treatment, water is either sent to drain or retained for use in the first treatment of the next cycle.

## SAFETY FEATURES

**Safety door switch** prevents a cycle from starting if the door is not fully closed and stops the washer operation if door is opened during a cycle.

**Door cable safety latch** prevents the door from falling in case of accidental cable breakage.

**Main power ON/OFF switch** on electrical supply box can be used to shut off power to the control system.

## OPTIONAL FEATURES

**Non-recirculated heated pure water rinse** treatment can be programmed to spray the load with heated pure water.

Pure water is stored in an integral electropolished stainless-steel tank equipped with an automatic fill, level control and overflow sensors. Pure water rinse treatment(s) can be programmed to use recirculated or non-recirculated pure water.

A steam or electric heating coil is located in the bottom of the storage tank to heat and maintain pure water temperature up to 190°F (88°C).

**Non-vented vapor condensor** for exhausting vapor through a cold-water condensor to the room, eliminating the need for venting the unit.

**Drain discharge cool down and cold water pre-wash** treatment can be programmed to spray load with recirculated cold tap water. At the end of each treatment, drain discharge feature ensures water drained to the building drain system does not exceed 140°F (60°C). If water temperature in the chamber sump is greater than 140°F (60°C), cold water is automatically added to reduce temperature of water being discharged to building drain.

**Drying system** treatment can be programmed to occur after the final rinse treatment of a cycle. During Drying treatment, chamber air is heated to the selected temperature (up to 240°F [116°C]) and recirculated through the chamber and accessory headers, while a portion is exhausted to vent. System includes a 1.5 HP (1.1 kW) blower and electric heaters.

**Universal shelving system** for two-level cleaning capability. The removable loading shelf is made of two sections: one section can easily be removed so only half of the wash chamber has a two-level configuration, providing ultimate flexibility for processing small, medium and large glassware items simultaneously.

## CONSTRUCTION

Wash chamber is constructed of #304 stainless steel (No. 4 finish), argon-welded and polished. Washer frame, cabinet, door and fasteners are of #304 stainless steel (No. 4 finish). Optional pure water tank is made of #316 stainless steel.

All treatments are under pressure of a stainless-steel pump with dual-speed (7.5/1.9 HP [5.6/1.5 kW]) motor. (High speed is for use only with the optional Multiple Level Loading System.) Pump impeller, shaft and casing are fitted with a mechanical seal. The pump motor is equipped with drip-proof frame, magnetic starter, overload protection and sealed bearings (requiring no periodic lubrication).

All components of the spray system, including screens, rotary spray arm and recirculation piping, are constructed of #304 stainless steel.

A valve is installed in the sump to facilitate sampling of wash and rinse water.

An internal battery backs up all cycle memory for up to 10 years. If a power disruption occurs during a cycle, the battery permits completion of the cycle once power is restored.

Resistive Temperature Devices (RTDs) sense the temperature inside the wash chamber and pure water tank. Signals, converted into electrical impulses, provide accurate control inputs/readouts throughout all cycles.

Washer is interpiped and interwired, requiring only one connection for each service and utility hook-up.

## ACCESSORIES*

**Additional chemical pump(s)** can be installed on the washer (up to two additional peristaltic pumps) for injections of different chemicals during desired treatments.

**Air compressor** is complete with automatic tank drain and pressure switch. Wiring at installation is not provided by STERIS.

**Barrier wall flange kit** includes six stainless-steel flanges to seal the opening between the recessed washer and wall.

* *Refer to SD419 for information on material handling accessories, including accessory headers and transfer carts.*

## PREVENTIVE MAINTENANCE

A global network of skilled service specialists can provide periodic inspections and adjustments to help ensure low-cost peak performance. STERIS representatives can provide information regarding annual maintenance programs.

## ENGINEERING DATA

| Max. Shipping Weight lbs (kg) | Max. Shipping Dimensions In (mm) | Max. Operating Weight lbs (kg) | Heat Loss | | A-weighted Equivalent Surface Sound Pressure Level** dB A | Max. Water Consumption per Cycle*** | | Max. Steam Consumption per Cycle*** lbs (kg) |
|---|---|---|---|---|---|---|---|---|
| | | | Vented BTU/hr (kJ/hr) | Non-vented BTU/hr (kJ/hr) | | Hot Water gal (L) | Pure Water gal (L) | |
| 1075 (488) | 42x91x50 (1067x2311x1270) | 1200 (544) | 1580 (1667) | 7200 (7596) | 67.6 | 50.4 (190.8) | 12.6 (47.7) | 8.3 (3.76) |

** At 75°F (24°C), 40% RH ambient.*

*** Calculated as described in ISO 3746 standard.*

**** Based on medium cycle with default values.*

## NOTES

1. Pipe sizes shown indicate terminal outlets only. Building service lines (not provided by STERIS) must supply the specified pressures and flow rates.
2. For all ventilation ducting from washer, STERIS recommends installation of dedicated, corrosion-proof, watertight duct to exterior of building, sloped towards washer. A 3.0" (76 mm) ID flexible duct is recommended.
3. Customer must ensure washer stands on a non-combustible floor.

**The base language of this document is ENGLISH. Any translations must be made from the base language document.**

## UTILITY REQUIREMENTS

***IMPORTANT:*** *Refer to equipment drawing 122-992-953 for installation details.*

**Hot Water**

1/2" NPT; 15 to 50 dynamic psig (103 to 345 kPa), maximum 90 psig (621 kPa) static; 110°F (43°C) minimum. Minimum flow rate: 3.9 gpm (14.7 L/min); maximum 7.5 U.S. gpm (28.5 L/min).

**Cold Water (if option applies)**

1/2" NPT; 30 to 50 dynamic psig (206 to 345 kPa), maximum 90 psig (621 kPa) static; 60°F (16°C) maximum. Minimum flow rate: 5.6 gpm (21.4 L/min). Maximum: 7.5 U.S. gpm (28.5 L/min).

**Steam**
**(Steam-Heated Unit only)**

3/4" NPT; 30-80 psig (206-550 kPa) dynamic; 185-400 lbs/hr (84-181 kg/hr). Peak flow rate: 210-470 lbs/hr (95-213 kg/hr). Maximum 90 psig (620 kPa) static.

**Condensate Return**
**(Steam-Heated Unit only)**

1/2" NPT. Peak flow rate: 1.0 U.S. gpm (4.0 L/min).

**Pure Water**

1/2" NPT; 5 to 50 dynamic psig (35 to 345 kPa), maximum 90 psig (621 kPa) static. Minimum flow rate: 4 U.S. gpm (15 L/min) maximum. 7.5 U.S. gpm (28.5 L/min). Minimum specific resistivity of 0.1 megohm/cm recommended.

**Air**

1/8" NPT; 65 dynamic to 125 static psig (448-860 kPa). Flow rate: 1 scfm (0.03$m^3$/min). Maximum particle size: 40 microns. Maximum particle density: 10 mg/$m^3$. Maximum dew point for water content: 45°F (7°C). Maximum oil concentration for oil content: 25 mg/$m^3$, as per ISO-8573-1, Class 5.

**Vent**

3" (76 mm) O.D.; 75 scfm (2.123 $m^3$/sec) (Not required if non-vented condenser option is selected.)

**Drain**

2" NPT; a 4" (102 mm) O.D. floor funnel or open drain, and 4" (102 mm) O.D. floor sink is recommended. Gravity drain maximum flow rate: 15 U.S. gpm (57 L/min). Pump drain maximum flow rate: 90 U.S. gpm (342 L/min).

**Electricity**

3/4" (19 mm) conduit size; 1" (25.4 mm) if over 24 Amps.

**Electricity (Steam-Heated Unit) With Drying System**

120/208 V, 60 Hz, 3-Phase, 4-Wire, 27 Amps; or 480 V, 60 Hz, 3-Phase, 3-Wire, 12.5 Amps; or 380/400/415 V, 50 Hz, 3-Phase, 3-Wire, 13 Amps; or 600 V, 60 Hz, 3-Phase, 3-Wire, 12 Amps.

**Electricity (Steam-Heated Unit) Without Drying System**

120/208 V, 60 Hz, 3-Phase, 4-Wire, 14.5 Amps; or 480 V, 60 Hz, 3-Phase, 3-wire, 7 Amps; or 380/400/415 V, 50 Hz, 3-Phase, 3-Wire, 7 Amps; or 600 V, 60 Hz, 3-Phase, 3-Wire, 9 Amps.

**Electricity (Electric-Heated Unit) With or Without Drying System**

480 V, 60 Hz, 3-Phase, 3-Wire, 26.5 Amps; or 380/400/415 V, 50 Hz, 3-Phase, 3-Wire, 31 Amps; or 600 V, 60 Hz, 3-Phase, 3-Wire, 24 Amps.

**Telecommunications (required for Remote Service Response Center, Available in North America only)**

ProConnect™ Response Center requires an active wired or wireless TCP/IP network; 10/100Base T Ethernet connection at each piece of connected equipment, Internet access and an IP address on the owner's building network. Ethernet cables/wireless hardware to connect each piece of equipment to the facility network will be provided by the owner. Owner will provide a dedicated PC for each unit with Windows XP® [1]operating system, a 2.8GHz processor, 512MB of RAM and 5 GB of available hard drive space to run the service agent along with a local login at the PC with vendor supplied username and password.

**CUSTOMER IS RESPONSIBLE FOR COMPLIANCE WITH APPLICABLE LOCAL AND NATIONAL CODES AND REGULATIONS.**

## NOTES

1. On 380/400/415 V units, NPT fittings are replaced by BSPT.
2. Maximum hardness for hot and cold water is 120 ppm ($CaCO_3$).

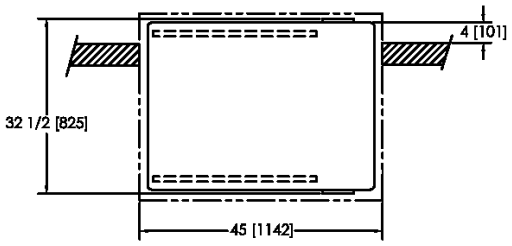
*1. Windows XP is a registered trademark of Microsoft Corporation.*

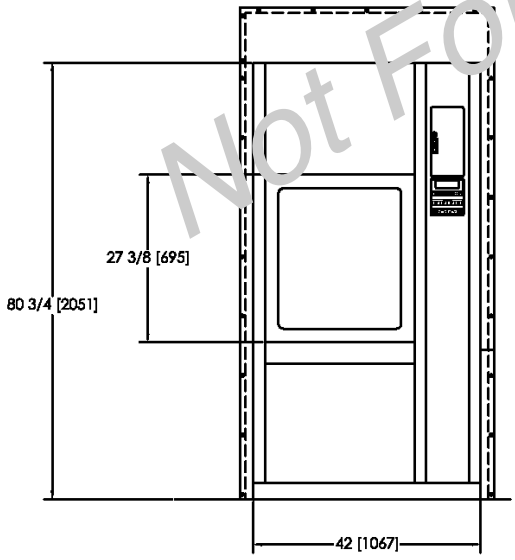
**Reference the following equipment drawings for installation details.**

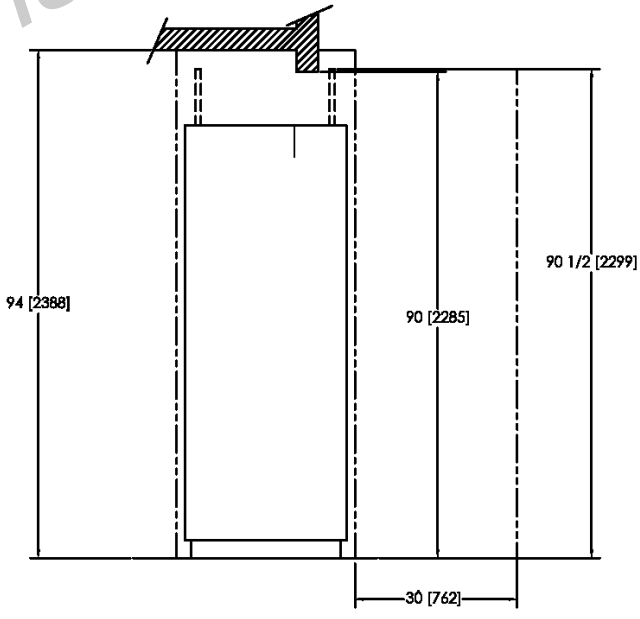
| Equip. Dwg. No. | Equipment Drawing Title |
|---|---|
| 122-992-953EN | Reliance 400 Laboratory Glassware Washer Domestic - International - English |

**Dimensions are inches (mm)**

**Dimensions are typical - drawing is not to scale.**



## NOTES

### Recommended Air Compressor

1. Enclosure must be well ventilated with a good air path to and from the ends of the compressor.
2. Inlet air temperature should be between 32°F (0°C) and 100°F (38°C). Locate air inlet outside of enclosed service areas. Inlet air pipe size is 1/4" (6 mm). Increase pipe diameter one size for every 10' (3048 mm) inlet filter is placed away from sink.
3. Use 3/8" (10 mm) or larger pipe between compressor and glassware washer when compressor is remotely located.
4. Electrical cord is not included.

## UTILITY REQUIREMENTS

### Recommended Air Compressor

**Electrical - Compressor Motor**

110-115 Volt, 50/60 Hz, 1-Phase, 4.4 Amps.

or

200-240 Volt, 50/60 Hz, 1-Phase, 1.4 Amps.

## ENGINEERING DATA - RECOMMENDED AIR COMPRESSOR WITH AUTOMATIC TANK DRAIN

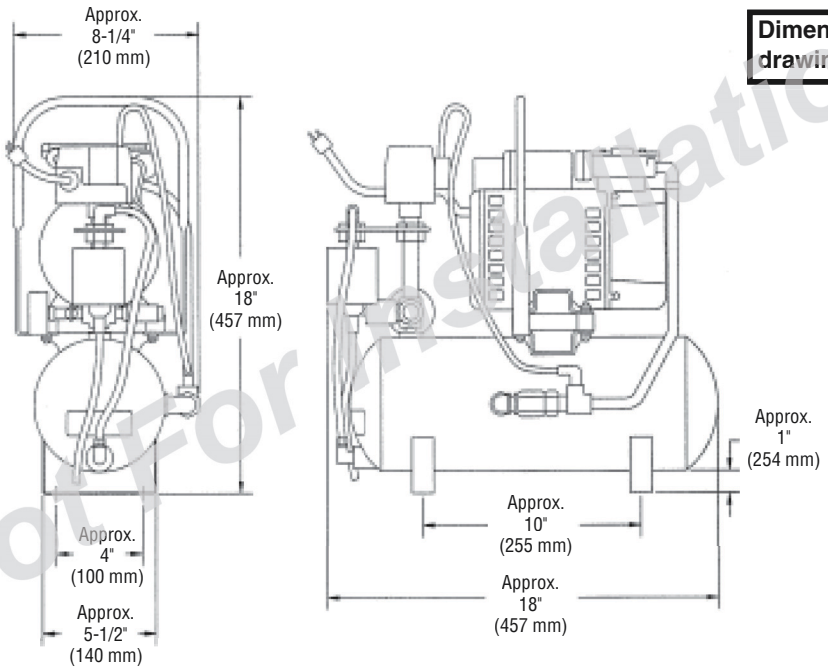
| HP (kW) | CFM Open Flow (cmm) | Weight lbs (kg) | Comp. Stages | Cyl. | TANK | | | | MOTOR | Noise Level dB |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Lubrication | Size In (mm) | Capacity US gal (L) | Max. Press psig (bar) | Operating Speed Hz (rpm) | |
| 1/3 (0.25 | 2.0 (.06) | 42 (19) | 1 | 1 | Oiless | See Below | 2.0 (7.6) | 100 (6.9) | 50 (1400) 60 (1675) | 69 |

**Reference the following equipment drawings for installation details.**

| Equip. Dwg. No. | Equipment Drawing Title |
|---|---|
| 920-005-138EN | Air Compressor With Automatic Tank Drain Domestic - International - English |

**Dimensions are inches (mm)**

**Dimensions are typical – drawing is not to scale.**



**For Further Information, contact:**

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