

APPLICATION

Reliance 400XLS and 500XLS Laboratory Glassware Washers are designed for thorough cleaning of laboratory glassware, plastic and metal goods used in research, production support and quality control laboratories.

DESCRIPTION

Reliance 400XLS and 500XLS Laboratory Glassware Washers are cabinet-type washers equipped with Allen-Bradley® control systems.* The washers are preprogrammed with five adjustable cycles. Five additional cycles are available for customized programming to meet specific operating requirements. Programmed descaling (considered 11th cycle) and priming cycles are also provided for routine maintenance.

Washers are built to seismic building code requirements (seismic report is provided with standard documentation) and are available as single- or double-door units, for installation either as freestanding units or recessed through a barrier wall.

Size (W x H x L)

Chamber load capacities:

400XLS: 26 x 25-1/8 x 26" (660 x 638 x 660 mm)

500XLS: 39 x 25-1/2 x 26" (990 x 648 x 660 mm)

Overall dimensions:

400XLS: 42 x 80 x 33-7/8" (1067 x 2032 x 861 mm)

500XLS: 56 x 80 x 33-7/8" (1422 x 2032 x 861 mm)

NOTE: When Effluent Heat Recovery option is selected, the drain valve and outlet are located outside of the washer. Refer to equipment drawings for more details.



Reliance 500XLS and 400XLS Laboratory Glassware Washers

(Typical - details may vary.)

STANDARDS

Reliance 400XLS and 500XLS Glassware Washers meet applicable requirements of the following standards, as certified by UL:

- **Underwriters Laboratories (UL)** Standard 61010-1, 2005.
- **Canadian Standards Association (CSA):** CAN/CSA-C22.2 No. 61010.1, Third Edition.
- **International Standard EN/IEC 61010-1**, Third Edition.
- **International Standard EN/IEC 61326-1**, Second Edition.
- **Governing Directive for the Affixing of the CE Mark:** Machinery Directive 2006/42/EC.
- **Conformity to other applicable directives:**
 - » Electromagnetic Compatibility Directive 2004/108/EEC
 - » Low Voltage Directive 2006/95/EC

The Selections Checked Below Apply To This Equipment

MODEL

- 400XLS 500XLS
 Steam-Heated Unit Electric-Heated Unit

VOLTAGE

- 208 Volt, 60 Hz, 3-Phase, 3-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

POWER DOOR CONFIGURATION¹

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

OPTIONS

- Non-Recirculated Heated Pure Water Rinse²
 Non-Vented Vapor Condenser^{3, 6}
 Vented Drying System
 Non-Vented Drying System^{4, 6}
 Effluent Heat Recovery System^{5, 6}
 Process Monitoring Package¹¹

- Drain Discharge Cool Down^{6, 10}
 Integrated Detergent Drawer
 316L Stainless-Steel Washing Chamber
 Printer

ACCESSORIES⁷

- Additional Wash Chemical Pumps (2 Pumps)⁸
 Steam Condensate Return to Drain Kit⁸
 Universal Shelving Shelf, Single (2 Max.)
 Universal Shelving Shelf, Double (1 Max.)⁹
 Air Compressor
 110-120V, 50/60 Hz 200-240V, 50/60 Hz
 Barrier Wall Flange Assembly
 400XLS 500XLS

NOTES:

1. Hinged Door(s) and Higher Chamber Available Upon Request.
2. Not Available for 208V Electric-Heated Units.

3. Only For Use with Units Without Drying System.
4. Includes Exhaust Heat Recovery System.
5. Only For Use with Steam-Heated Units.
6. Requires Cold Water Supply.
7. Refer to *SD419* for Material Handling Accessories.
8. Not Installed on Shipped Units. On-Site Installation Required.
9. Only For Use with 500XLS Models.
10. Drain Discharge Cooldown Option Is Required to Guarantee/Meet the 140°F (60°C) Maximum Drain Temperature.
11. Units without Drying and Non-Recirculated Heated Pure Water Rinse Systems Cannot Be Equipped with Process Monitoring Package Option.

Item _____

Location(s) _____

* Allen-Bradley is owned by Rockwell Automation, Inc.
 ** Pushbuttons and Indicator Light on Unload Side of DD Units.

FEATURES

Vertical sliding power door(s) is (are) constructed of double-pane tempered glass, allowing the operator to view the chamber with the 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 on the touch screen. If double doors are ordered, a door interlock feature is provided to prevent cross-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 touch pad is pressed. Door(s) is (are) dynamically pressed against a silicone gasket ensuring complete air and water tightness of wash chamber.

NOTE: *Hinged door(s) available upon request.*

LED, mounted outside the wash chamber, illuminates the wash chamber.

Spray system includes two (400XLS) or three (500XLS) manifold connectors positioned on the bottom of the chamber, and one (400XLS) or two (500XLS) rotary spray arms suspended from the top of the chamber. Manifold connectors automatically connect to accessory headers at the start of each cycle. Additional connectors are installed on chamber sides to accommodate optional universal shelves (used to process loads on two levels).

Insulation covers outer top, sides and bottom of washer chamber to minimize heat loss and noise. Insulation is composed of 1" (25.4 mm) thick fiberglass and includes a vapor barrier.

USB Port easily accessible from washer front provides connectivity for user to export cycle data.

Sampling valve [installed in sump] facilitates wash and rinse water sampling.

Removable stainless-steel debris screen, located in the bottom of the wash chamber (sump), prevents large debris from entering the piping system and pump.

Two adjustable peristaltic pumps automatically dispense a selected amount of liquid chemicals (1/8 to 6.0 oz/U.S. gal [1.0 to 50 mL/L]) into the chamber sump during desired treatment. Included are 50' (15 m) of tubing and electrical wiring, pick-up tubes and low level sensors for remote location of chemical containers (5 U.S. gal [19 L]). Also note that one pump can be used to automatically neutralize solution prior to draining (timebased).

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, water is automatically drained from the sump.

SMART Filling System reduces water consumption by automatically selecting the minimal quantity of water required based on the selection of accessories.

Vapor removal fan (1/15 HP, 50 W) is provided to remove vapor from the chamber throughout the cycle (only supplied on units without drying).

Control System is an Allen-Bradley CompactLogix™ controller series with a PanelView™ Plus 7 color touch screen.¹ Memory can contain up to 10 processing cycles that are fully programmable according to Customer preferences.

Cycle phase times, temperatures and other key process parameters are also programmable.

Once a cycle is started, the programmed cycle values are locked in and cannot be changed until the 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.

Washer can be programmed to automatically shut down after the completion of a cycle to conserve energy.

Total cycle remaining time is constantly displayed on the operator interface.

Visual and Audible Alarm indicates cycle completion. The alarm can be programmed to automatically shut off after a predetermined period of time.

One contact is used for external alarm. A second contact can be used to either indicate cycle complete or energize an external pure water valve (not supplied by STERIS).

RS-232 Port is used to download cycle process data to the optional integrated printer or to an external computer.

User Management system enables any supervisor to add/delete users, modify their properties and select privileges. Cycle Usage feature allows viewing, printing and resetting number of cycles run by each user. **Audit trail** functionalities embedded in control system permits recording and viewing user actions directly on HMI. Furthermore, **batch reports** are recorded for each cycle. Audit trails and batch cycles are saved in CSV format for ease of transfer to a USB stick.

Mobile and PC Messaging allows users to receive text messages and e-mail alerts regarding the status of washer. Operator can choose from a list of possible alerts from which to be notified. Easy set-up instructions are included in Installation Manual.

CYCLE DESCRIPTION

The Reliance 400XLS and 500XLS Glassware Washers feature 10 programmable cycles. Each cycle can be programmed to include up to 23 separate treatments. Possible standard treatments include: up to four pre-wash, up to five wash, up to four rinse, up to nine pure water rinse and drying (if option applies). Once a cycle is selected, the washer automatically processes the load through the programmed treatments.

The washer is programmed with five factory-set processing cycles: EXTRACare, ENVIROCare, PLASTIC, STANDARD and RINSECare. A DESCALER cycle (considered 11th cycle) is also pre-programmed to enable routine descaling procedure. All factory-set cycles can be modified by an authorized operator to create complete wash programs such as the following:

- **PRE-WASH:** Load is sprayed with recirculated water at the selected temperature (hot, optional cold or sump heated to 203°F [95°C] - see *NOTE* at end of Section) for a selected amount of time (0-15 minutes). On completion of treatment, water is sent to drain.

1. Allen-Bradley CompactLogix and PanelView Plus are trademarks of Rockwell Automation, Inc.

- **WASH 1:** Load is sprayed with recirculated solution at the selected temperature (hot, optional cold or sump heated 203°F [95°C] - see *NOTE* at end of Section) 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. Treatment does not start until selected temperature is reached. On completion of treatment, solution is sent to drain.
- **RINSE:** Load is sprayed with recirculated water at selected temperature (optional cold, hot or sump heated to 203°F [95°C] - see *NOTE* at end of Section) for the selected amount of time (0-15 minutes). If heated water is selected, treatment does 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 selected temperature (ambient or sump heated to 203°F [95°C] - see *NOTE* at end of Section) for a selected amount of time (0-15 minutes), or sprayed with non-recirculated pure water (supplied from optional storage tank) for up to 10 seconds. If heated water is selected, treatment does 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.
- **DRYING (Option):** HEPA filtered heated air is circulated through the piping, spindles, load items and chamber for the selected time (0 to 30 minutes). Temperature can be set to High (approximately 240°F [115°C]) for regular glassware or to Heat Sensitive (approximately 180°F [82°C]) for plastic items. If SMART drying is selected, drying time automatically adjusts itself according to the size of the load.

NOTE: Maximum water temperature obtainable is limited by altitude. At 6560 feet (2000 meters), maximum temperature is 191°F (88°C). Refer to Equipment Specification (920-514-465) for further details. Cold water can be selected for the various treatments if one of the following four options is selected:

- *Non-Vented Vapor Condenser*
- *Drain Discharge Cool Down*
- *Non-Vented Drying*
- *Effluent Heat Recovery System*

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.

The door is equipped with a **safety sensor** to automatically retract (open) the door if obstruction is detected in the doorway.

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 316L stainless-steel tank equipped with an automatic fill and level control. 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 203°F (95°C). This option is not available for 208V Electric-Heated Units.

NOTE: Maximum water temperature obtainable is limited by altitude. At 6560 feet (2000 meters), maximum temperature is 191°F (88°C). Refer to Equipment Specification (920-514-465) for further details.

Non-vented vapor condenser can be supplied for exhausting vapor through a cold-water condenser to the room, eliminating the need for venting the unit. To be used on units not equipped with Drying Option. Cold water must be supplied to the washer.

Vented Drying System treatment can be programmed to occur after the final rinse treatment of a cycle. During Drying treatment, HEPA filtered air is heated to the selected temperature and recirculated through the chamber and accessory headers, while a portion is exhausted to vent. System includes a 3 HP (2.2 kW) blower and 8.5 kW electric heaters. SMART Drying System, if selected, automatically adjusts cycle time according to size of the load.

Non-Vented Drying System treatment can be programmed to occur after the final rinse treatment of a cycle. During Drying treatment, HEPA filtered air is heated to the selected temperature and recirculated through the chamber and accessory headers, while a portion is exhausted to the room through a cold water condenser. Energy is recovered by using hot exhaust air to pre-heat fresh incoming air. System includes a plate heat exchanger, 3 HP (2.2 kW) blower and 8.5 kW electric heaters. SMART Drying System, if selected, automatically adjusts cycle time according to size of the load. Cold water must be supplied to the washer.

Effluent Heat Recovery System (steam-heated units only) includes an effluent cooling system combined to an energy recovery system that pre-heats incoming process water. Cold water is circulated through a stainless-steel coil located in the integrated stainless-steel drain tank to cool down the effluent prior to drain. The heat from the effluent is transferred to the cold water which is subsequently used for the cleaning cycle. The system eliminates the need for connecting the washer to a hot water supply line and reduces the need to send cold water to drain for cooling purpose.

NOTE: When Effluent Heat Recovery System option is selected, the drain valve and outlet are located outside of the washer and cold water must be supplied to the washer.

Process Monitoring Package includes a pump pressure sensor and conductivity system to monitor the concentration of detergent in wash solutions and conductivity of water after final rinse. A pressure sensor generates an alarm should pressure at the circulation pump outlet fall below an adjustable set point. With this option, detergent(s) is (are) injected in the chamber until the adjustable conductivity set point has been reached to ensure the appropriate amount has been injected. Conductivity of the rinse water is also measured prior to drain. Rinses are repeated until conductivity has reached the adjustable set point, minimizing the quantity of rinse water used to meet performance criteria.

Drain Discharge Cool Down system, at end of each treatment, ensures water drained to building drain system does not exceed 140°F (60°C). If water temperature in chamber sump is greater than 140°F (60°C), cold water is automatically added to reduce temperature of water being discharged to building drain. System also cools down steam condensate if condensate return to drain accessory is installed on washer. Cold water must be supplied to washer.

Integrated Detergent Drawer system capable of holding two x 1 gal containers (4L) is integrated to the washer. The system includes two pick-up tubes and low level sensors for 1 gal (4L) containers.

Wash chamber is constructed of 316L Stainless Steel instead of 304L.

Printer can be integrated to the control panel to maintain records of cycle parameters and alarms.

CONSTRUCTION

Wash Chamber (incl. sump): #304 stainless steel and optional 316L (No. 4 finish, 35 ra), argon-welded and polished. Washer cabinet is made of #201 and #304 stainless steel (No. 2B finish). Fasteners and steam coil (if applicable) are made of #304 stainless steel. All components of the spray system (including screens, rotary spray arms and recirculation piping) are constructed of #304 stainless steel. Optional pure water tank is made of #316 stainless steel.

Reliance 400XLS water consumption (per fill): 5.8 gal (22L) if unit used without shelving system (low pump speed) and 9.5 gal (36 L) if unit used with shelving system (high pump speed).

Reliance 500XLS water consumption is 7.5 gal (28.4L) if unit used without shelving system and 12.5 gal (47.3 L) if unit used with shelving system.

All treatments are under pressure of a #316L 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 Universal Shelving Accessories.) 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).

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

ACCESSORIES¹

Two Additional Chemical Pumps can be installed on the washer for injection of different chemicals during desired treatments. For remote location of 5 gal (19L) chemical containers, 50' (15 m) of tubing and electrical wiring, pick-up tubes and low level sensors are included. Note that additional chemical pumps are not installed at the factory; and must be installed on-site. Also note that one pump can be used to automatically neutralize solution prior to draining (timebased).

Steam Condensate Return to Drain Kit includes piping to connect the condensate return outlet to the drain on the washer. If washer is equipped with Drain Discharge Cool Down option, condensate return is cooled down using cold water prior to entering the drain system. Note that these drain kits are not installed at the factory; and must be installed on-site.

Universal Shelving System, Single Shelf, can easily be removed so only a part of the wash chamber has a 2-level configuration, providing capacity to process small, medium and large glassware items simultaneously. Up to two single loading shelves can be installed by user to provide capability of processing load items on two levels.

Universal Shelving System, One Double Shelf, can be installed by user in a Reliance 500XLS Glassware Washer to provide capability of processing load items on two levels for two-thirds of the wash chamber capacity. The system provides capacity to process small, medium and large glassware items simultaneously. A single Universal Shelf can also be added on the 500XLS Models to provide two full levels of processing.

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.

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.

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 (CaCO₃).
3. Minimum specific resistivity of 0.1 MΩ·cm is recommended for pure water.
4. Pipe sizes shown indicate terminal outlets only. Building service lines (not provided by STERIS) must supply the pressures and flow rates specified in equipment drawings.
5. For all ventilation ducting from washer, STERIS recommends installation of a dedicated 3" (76 mm) ID flexible, corrosion-proof, watertight duct to exterior of building, sloped towards washer.
6. Customer must ensure washer stands on a non-combustible floor.
7. This Unit is not designed for use in areas that require explosion proof rated equipment.

¹. Refer to [SD419](#) for information on material handling accessories, including accessory headers and transfer carts.

ENGINEERING DATA

Maximum Shipping Weight lbs (kg)	Maximum Shipping Dimensions In (mm) W x H x D	Maximum Operating Weight lbs (kg)	Heat Loss*		A-weighted Equivalent Surface Sound Pressure Level† dB A	Max. Water Consumption gal (L)				Maximum Steam Consumption per Cycle‡ lbs (kg)
			(kJ/hr)			per Cycle‡		per Fill‡		
			Vented BTU/hr	Non-vented BTU/hr		Hot Water**	Pure Water	Hot Water**	Pure Water	
400XLS 1200 (544)	50 x 91 x 42 (1270 x 2311 x 1067)	1300 (589)	1580 (1667)	7200 (7596)	67.6	23.2 (88)	5.8 - 9.5 (22 - 36)	5.8 (22)	5.8 - 9.5 (22 - 36)	5 (2.27)
500XLS 1500 (680)	62 x 91 x 42 (1575 x 2311 x 1067)	1500 (680)	1580 (1667)	7200 (7596)	67.6	30 (114)	7.5 - 12.5 (28 - 47)	7.5 (28.4)	7.5 - 12.5 (28 - 47)	6.5 (2.95)

* At 75°F (24°C), 40% RH ambient.

† Calculated as described in ISO 3746 standard.

‡ Based on 400XLS STANDARD cycle with default values, one level washing, recirculated pure water rinse. Cold Water consumption varies depending on selected options, see Equipment Drawings.

** Hot water supply not required if Effluent Heat Recovery System is provided.

Air

1/8" NPT

Vent

3" (76 mm) O.D.

(Not required if non-vented system is selected)

Drain

1-1/2" NPT; a 3" (76 mm) O.D. floor funnel or open drain, and 3" (76 mm) O.D. floor sink is recommended.

Electricity

3/4" (19 mm) conduit size;

1" (25.4 mm) if over 24 Amps

208 V, 60 Hz, 3-Phase, 3-Wire; or

480 V, 60 Hz, 3-Phase, 3-Wire; or

380/400/415 V, 50 Hz, 3-Phase, 3-Wire; or

600 V, 60 Hz, 3-Phase, 3-Wire

UTILITY REQUIREMENTS

IMPORTANT: Refer to [EQUIPMENT DRAWING 920-514-458 FOR 400XLS MODEL](#), [920-514-459 FOR 500XLS MODEL](#), for installation details.

Hot Water

1/2" NPT (not required if Effluent Heat Recovery System is selected).

Cold Water

1/2" NPT (required for Non-Vented Vapor Condenser, Non-Vented Drying System, Effluent Heat Recovery System and Drain Discharge Cool Down options).

Steam (Steam-Heated Unit only)

1/2" NPT

Condensate Return (Steam-Heated Unit only)

1/2" NPT

Pure Water

1/2" NPT

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 and 100°F (0 and 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

110-120V, 50/60 Hz, 3.5/2.8A, 1-Phase

or

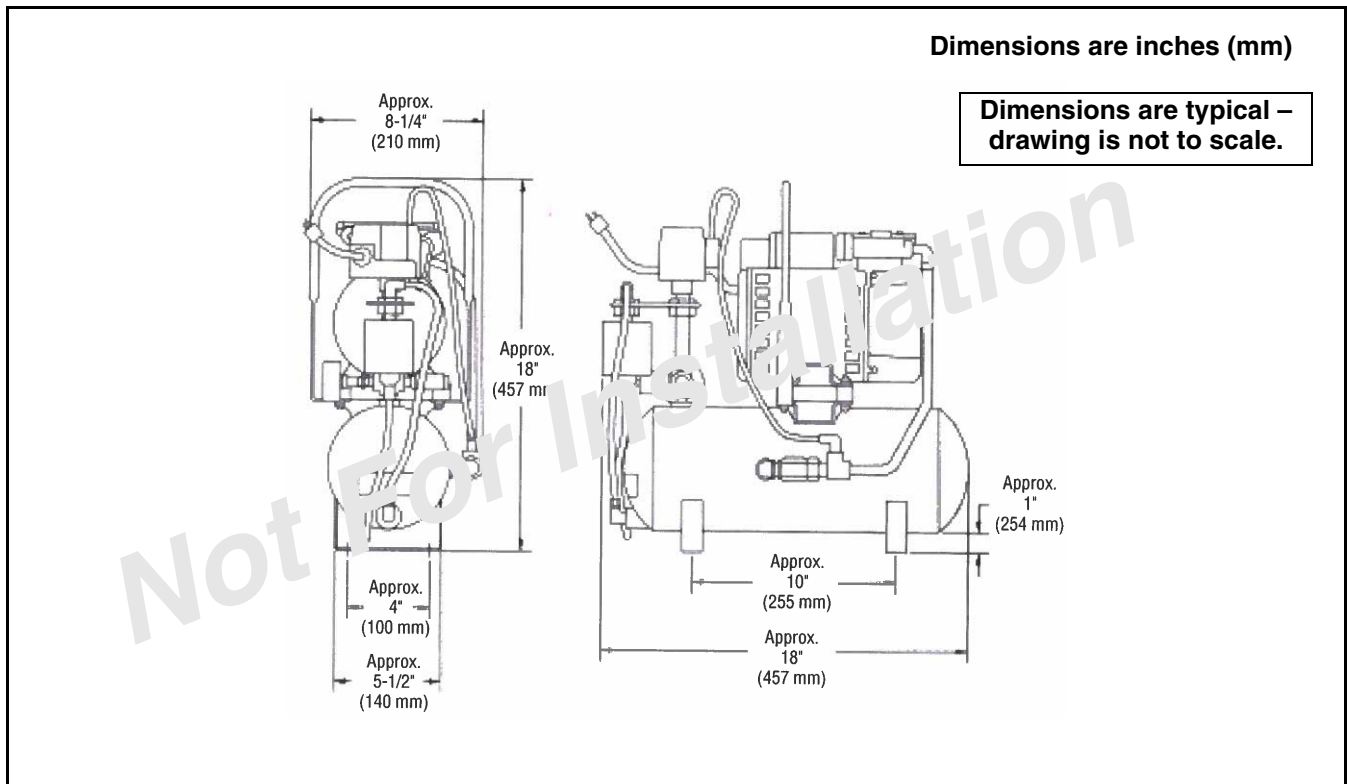
200-240V, 50/60 Hz, 1.8/1.4A, 1-Phase

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 drawing for installation details

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



For Further Information, contact:



STERIS Corporation
5960 Heisley Road
Mentor, OH 44060-1834 • USA
440-354-2600 • 800-548-4873
www.STERISLifeSciences.com

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