320LX Cage and Bottle Washer Technical Data Sheet

APPLICATION

The Cage and Bottle Washer is a heavy-duty, single chamber, hydro-spray washer designed for thorough, efficient cleaning of cages, racks, debris pans, and miscellaneous items used in the Vivarium.

SIZE - INCHES

Compartment – 48” W x 32" H x 34" D
Overall Unit* - 72" W x 82" H x 38.5" D

***Size may vary depending upon options chosen.**

STANDARD FEATURES

OSCILLATING SPRAY JET SYSTEM

The washer is provided with an oscillating jet spray system for all treatment solutions. The system consists of machined jets mounted above, below and on each side of washer chamber. The system is driven by a bi-directional pneumatic air cylinder, operating in conjunction with the treatment schedule.

PERSONNEL SAFETY FEATURES

Opening the load-end (or unload-end if pass-through unit), automatically stops operation of the washer. The door(s) must be closed, alarm acknowledged, and the “Cycle Start” button depressed to continue operation.

An Emergency Stop (ES) button is provided on the load-end control panel (and unload-end if pass-through unit). If the operations of the wash cycle are interrupted by depressing the (ES) Button, the operator must reset the button and push the “Cycle Start” button to continue operations from the beginning of the selected cycle.

MULTI-CYCLE COLOR/GRAPHIC PLC CONTROL SYSTEM

A solid-state PLC control system monitors and automatically controls all process operations and functions. A twelve-cycle treatment menu may be programmed and retained to permit operating personnel to accommodate a wide variety of loads and processing requirements. Individual cycle phase times and temperatures and other key process parameters are programmable. Each cycle may be locked in individually by supervision to ensure process integrity. Cycle programming may be controlled by a supervisory access code. With the optional Strip-Chart Printer, each cycle program may be reviewed and printed on demand.

AUTOMATIC TEN-PHASE TREATMENT CYCLE

The standard treatment cycle consists of the following phases: Pre-wash, Agent Wash 1, Agent Flushing Rinse, Agent Wash 2, Acid Agent Soak, Acid Neutralizer, First Rinse, Second Rinse, Final Rinse, and Vapor Removal. All cycle phases may be selected or deselected by the user. All Agent Wash and Rinses treatments are recirculated under pump pressure except the optional non-recirculated rinses. The cycle, once activated, is completely automatic.

AUTOMATIC SELF-CLEANING DEBRIS SCREEN

The treatment pump is provided with a self-cleaning debris screen having perforations considerably smaller than the machined jet orifices. The screen is inter-piped and inter-wired with the control system to filter all solutions and automatically flush debris to the building drain when the unit is drained.

TEMPERATURE GUARANTEE

The operator may select to guarantee the temperatures for each phase of the cycle. If the temperature guarantee is selected, the phase will not begin timing until the recirculated water temperature reaches the set point. If the recirculated temperature drops below the set point during phase, the timer will stop. The phase-timer resets or continues from where it stopped at the

user's option, ensuring the proper temperature during entire treatment.

INCOMING UTILITY GAUGES
The washer is provided with incoming steam and hot water pressure gauges.

DATA COMPUTER PORT
An Ethernet port is provided to permit the capability of downloading cycle real-time performance data to a remote computer terminal. Custom software may be provided to accommodate specific applications.

UL-INSPECTED CONTROL PANEL
The main control panel is inspected and labeled in accordance to the UL standards.

STAINLESS STEEL RECIRCULATING COMPONENTS AND PIPING
All piping, jets, and components, including valves, pump(s), and piping that come in contact with the recirculated wash solutions, are provided in stainless steel.

OPERATION

The operator places the items to be cleaned in the wash chamber, closes the door, selects the proper cycle, and depresses the "Cycle Start" button. The washer proceeds through the treatment schedule and automatically shuts off at the completion of the cycle. The operator then opens door and removes the cleaned items.

TREATMENT SCHEDULE – (Programmable with any or all phases below.)

PRE-WASH
Water remaining in the chamber sump from final rinse of the previous cycle is recirculated through the jet system under pump pressure and pumped to drain upon completion. Phase is adjustable from 0 – 9999 seconds in 1-second intervals and 120°F - 190°F in 1° intervals.

ALKALINE WASH
Hot water from the house supply fills the sump and is pumped through the jet system. As required, an alkaline detergent is added during recirculation using either the optional ***LYNX-*** or customer-supplied detergent injection pumps. At the end of the treatment, the detergent solution is pumped to drain. Phase is adjustable from 0 – 9999 seconds in 1-second intervals and 120°F - 190°F in 1° intervals.

DETERGENT FLUSHING RINSE
Hot water from house supply fills the chamber sump and is recirculated through the jet system under pump pressure to remove residual detergent. Recirculated water is pumped to drain on completion of treatment.

ACID WASH
Hot water from the house supply fills the sump and is pumped through the jet system. As required, an acid detergent is added during recirculation using either the optional *LYNX* or customer-supplied detergent injection pumps. At the end of the treatment, the detergent solution is pumped to drain. Phase is adjustable from 0 – 9999 seconds in 1-second intervals and 120°F - 190°F in 1° intervals.

ACID NEUTRALIZATION (Optional)
This phase may be programmed to add a neutralizer to change the pH of the acid washing solution to a desired level. The phase is adjustable from 0 – 9999 seconds in 1-second intervals after the completion of the wash phase. Neutralizer is injected for short periods with time for mixing between each injection period until the desired pH is attained.

ALKALINE NEUTRALIZATION (Optional)
Same as above for the alkaline wash solution.

FIRST RINSE
Hot water from house supply fills the sump and is recirculated through the jet system under pump pressure. Recirculated water is pumped to drain on completion of treatment. Phase is adjustable from 0 – 9999 seconds in 1-second intervals and 120°F - 190°F in 1° intervals.

SECOND RINSE
Same as the first rinse.

FINAL RINSE
Same as the first rinse except at the end of the treatment the water may be retained in the chamber sump for use as the pre-wash water in the subsequent load or directed down the facility drain. Phase is adjustable from 0 – 9999 seconds in 1-second intervals and 120°F - 190°F in 1° intervals.

With the purchase of the **NON-RECIRCULATED FINAL RINSE OPTION,** the operator has the option to have the load be sprayed with fresh house water through a separate and dedicated spray system saving both water and time. Water can be retained in the sump to be used as the pre-wash in a subsequent wash load. The phase is adjustable from 0 – 999 seconds in 1-second intervals. (Typically 15 second duration).

EXHAUST
The unit stands idle for a sufficient length of time to remove the residual vapors. Phase is adjustable from 0 – 9999 seconds in 1-second intervals.

CONSTRUCTION

The base, wash chamber and chamber sump are of stainless steel and of smooth construction without crevices and ledges for the potential build-up of debris and contamination. The base and chamber sump are of one-piece welded construction with the base containing supports to accommodate the load grid.

The washer is provided with manually operated, countered-balanced, drop-down doors. The chamber door(s) are of double-wall construction, insulated with rigid chloride-free insulation and equipped with a sealing gasket, a 16"x35" tempered insulated double-pane glass observation window, and counterweights for ease of opening.
The washer is insulated with rigid chlorine-free insulation covered by protective stainless steel panels.

The chamber sump is equipped with a level control switch, automatic water fill port, and stainless steel steam coil heating for the recirculated treatment solutions. The control system displays and monitors recirculated solution temperatures. Sump is completely drained after each phase, preventing cross-contamination between treatment phases and cycles.

All recirculated treatments are under pressure of a 7 ½-Hp pump. This system is equipped with a direct-reading, liquid-filled pressure gauge.

The stainless steel steam coil heating systems in the chamber sump are complete with condensate return and steam traps. Steam coils are designed to ASME Section VIII, Div. 1, Unfired Pressurized Vessel Code, and are easily removable for cleaning or maintenance.

The washer is equipped with a transformer for the control circuit; integral Type-2 coordinated protective magnetic starters requiring no upstream fuses for overload protection of all motors, and all other electrical components required for the operation.

An exterior LED light is provided to illuminate the wash chamber.

The washer is equipped with pneumatically actuated ball valves to control the output of the pump to the jet system.

The washer is inter-piped and inter-wired so that only one connection is required for each service or utility.

The washer is supplied with four (4) threaded detergent injection ports and electrical connections for the installation of automatic detergent injection pumps. Washer sump is also equipped with two (2) threaded half-couplings for the connection of external devices.

Programming is in Military time and Fahrenheit temperature. Times and temperatures are expressed in seconds and full-degree increments, respectively. An internal battery backs up all cycle memory for up to ten (10) years.

A highly visible color touch screen displays cycle program data on demand and real-time in-process cycle performance. All cycle deviations are alarmed both visually and audibly and must be acknowledged by the operator.

The washer is designed to meet specifications by placing all utility services on either the right-hand or left-hand side of the washer, as viewed from the load-end.

The washer is provided with one (1) additional dry electrical contact for control for external damper(s) installed in the facility HVAC system (by customer).

CONFIGURATION (select one:

- ☐ **Single Door - Right-Hand Service**
- ☐ **Single Door - Left-Hand Service**
- ☐ **Pass-Through Right-Hand Service**
- ☐ **Pass-Through Left-Hand Service**

VOLTAGE (select one:

- ☐ **208 Vac, 3-Phase 60Hz 4-Wire 3-Phases & Neutral**
- ☐ **208 Vac, 3-Phase 60 Hz 3 Phases Only**
- ☐ **230 Vac, 3-Phase 60 Hz**
- ☐ **480 Vac, 3-Phase 60 Hz**
- ☐ **600 Vac, 3-Phase 60 Hz**

OPTIONAL FEATURES

☐ **KNOCK-DOWN CONSTRUCTION**

The washer is disassembled and shipped in sections to enable the unit to be moved through the facility or fit a small elevator for egress into its place of installation. Uncrated sections pass through a 3'-6" x 6'-8" standard doorway.

☐ **HOUSE HOT WATER HEAT EXCHANGER**

The washer is equipped with an in-line heat exchanger to raise the house hot water supply temperature by approximately 60° to 80°F. The heat exchanger is inter-piped and inter-wired for automatic operation.

☐ **AUTOMATIC DAMPER**

The washer is provided with an automatically actuated damper mounted in the exhaust line and coordinated with the automatic cycle. Damper is fully open during exhaust phase and partially open during washer operation. Damper is designed for vertical connection to exhaust vent system.

☐ **90-DEGREE AUTOMATIC DAMPER**

The washer is provided with an automatically actuated damper mounted in the exhaust line and coordinated with the automatic cycle. Damper is fully open during exhaust phase and partially open during washer operation. Damper is designed with 90° angle for connection to horizontal exhaust vent system.

☐ **EXHAUST FAN**

The washer is provided with a fan inter-wired with the PLC control system to exhaust residual vapors from within the wash chamber. Fan shall be supplied complete with 3-phase, 60 Hz motor and an integral Type-2 coordinated protective magnetic starter for overload protection. Fan is designed to push exhaust a short distance at approximately ½" static pressure. Fan is provided with remote-mounted grease fittings for convenient access.

☐ **"SMART" COOL-DOWN SYSTEM**

The washer is provided with Eco-Friendly air- effluent cool-down system. Cold ed are is pulled through the chamber to cool effluent rapidly without the need for cold water. The effluent is cooled to 140 degrees or below before discharging to drain. The system is designed not to add additional time to the overall cycle.

☐ **DRAIN DISHCARGE COOL-DOWN SYSTEM WITH COLD-WATER INJECTION**

The washer is provided with a cold-water inlet valve, integral with the drain line, to add cold water during draining for assistance in reducing the effluent temperature. A temperature gauge is included on the cold-water inlet piping. A cold-water connection is required when this option is selected.

☐ **DRAIN DISHCARGE COOL-DOWN SYSTEM WITH SURGE TANK**

The washer is provided with a cold-water inlet valve and an integral surge tank to accept spent solutions and cold water for effluent tempering and gravity draining. A temperature gauge is included on the cold-water inlet piping. A cold-water connection is required when this option is selected.

☐ **NON-RECIRCULATED FINAL RINSE**

The final rinse treatment consists of hot water from house supply sprayed through a separate set of jets. The water shall not be recirculated.

☐ **NON-VENTED VAPOR CONDENSER**

A cold-water condenser is provided to remove residual vapors from the wash chamber and to direct the condensed vapors to drain. A connection to the building exhaust system is not

required when this option is selected. The condenser requires a cold-water connection and increases the overall width of the washer by 12".

☐ **PASS-THROUGH DOOR INTERLOCK SYSTEM**

System prevents both load-end and unload-end doors from being opened at the same time, eliminating risk of cross-contamination. When one door is opened, the opposite door is locked with an air-actuated piston. If power is lost, pistons fail in the open position.

☐ **LYNX OPTI-WASH SYSTEM**

The washer is supplied with a separate non-recirculated rinse header system, sump overflow system, and other components and programming, allowing the operator to run a highly efficient, low water cleaning and disinfection cycle. A typical rodent cycle time is estimated at less than 10 minutes without disinfection, and less than 15 minutes with disinfection. Water consumption is estimated at 20 – 30 gallons. Customer can expect to reduce Steam, Hot Water, Cold Water, Electricity consumptions.

☐ **AIR COMPRESSOR**

The washer is provided with an air compressor inter-wired and inter-piped with the automatic control system to supply the air demand required by the washer. The compressor is supplied with regulator, filter, and a holding tank.

☐ **STAINLESS STEEL SERVICE ACCESS**

Stainless steel side panels and supports are provided to enclose the service component side of the washer. Panels are removable for easy access.

☐ **HIGH-ALTITUDE TREATMENT PUMP**

The washer is provided with a high-altitude treatment pump for installations with 3000 feet or above sea-level elevation.

☐ **STRIP-CHART PRINTER**

A 40-column impact printer with paper take-up is provided to record all cycle program parameters and process performance data. Each program time/temperature profile may be printed as required.

☐ **REMOTE-MOUNTED PRINTER**

The washer is provided with a remote-mounted impact printer to record all cycle program parameters and process performance data. Each program time/temperature profile may be printed as required.

☐ **REMOTE-MOUNTED CONTROL COLUMN**

The washer is provided with an additional 20 feet of conduit and connections for remote mounting of the control column.

☐ **SEISMIC TIE-DOWN**

The washer is designed to comply with Seismic Zone 3 and 4 requirements.

☐ **CSA - INSPECTED CONTROL SYSTEM**

The main control panel is inspected and labeled in accordance with CSA Standards.

☐ **LOW-PRESSURE STEAM PIPING**

The washer has special steam line piping to accommodate 10 to 30 PSI operating steam pressure.

☐ **INTEGRAL DATA COLLECTION SYSTEM**

In lieu of, or in addition to an integral strip chart printer, the Data Collection System is provided to track, record, and store performance data as it is created during the run process of the washer. This data can be downloaded for printing or future reference and compliance purposes. Data such as date, time, cycle parameters, phase times and temperatures, alarms and other machine functions are captured and logged. Several options are available for storage:

☐ **Thumbdrive Recording System:** All data is recorded onto a removable USB thumbdrive in CSV format.

☐ **Plug & Play** - custom LYNX data logging program downloaded onto a LYNX provided dedicated laptop. Customer shall take ownership of laptop and connectivity, network internet for data retrieval.

☐ **Software Package on to Customer's network:** Custom LYNX data logging program downloading to be coordinated with customer's IT department onto customer's network. LYNX to provide program and technical assistance for the upload and coordination for the system to accept data from the washer. Customer shall coordinate connectivity, network for data retrieval.

☐ **ALKALINE DETERGENT INJECTION SYSTEM**

The washer is equipped with a liquid detergent injection pump, detergent pick-up tube and 50 feet of tubing for timed direct injection of alkaline detergent into the chamber sump during the alkaline wash phase.

☐ **ACID DETERGENT INJECTION SYSTEM**

Washer is equipped with a liquid detergent injection pump, detergent pick-up tube and 50 feet of tubing for timed direct injection of acid detergent into the chamber sump during acid wash phase.

☐ **AUTOMATIC ALKALINE NEUTRALIZER INJECTION SYSTEM**

The washer shall be equipped with a liquid detergent injection pump, detergent pick-up tube and 50 feet of tubing for timed direct injection of neutralizer into the chamber sump after an alkaline wash phase to neutralize the alkaline wash solution. Neutralizer and wash solution shall be recirculated through the jet system after acid wash phase and prior to drain.

☐ **AUTOMATIC ACID NEUTRALIZER INJECTION SYSTEM**

The washer shall be equipped with a liquid detergent injection pump, detergent pick-up tube and 50 feet of tubing for timed direct injection of neutralizer into the chamber sump after an acid wash phase to neutralize the acid wash solution. Neutralizer and wash solution shall be recirculated through the jet system after acid wash phase and prior to drain.

☐ **pH NEUTRALIZATION MONITORING SYSTEM**

The washer is equipped with control hardware and pH probe to monitor and control the pH level of drain discharge. Each time the washer attempts to drain, the pH level is checked. If the pH level is within a pre-set range, the washer will drain. If not, the proper neutralizing agent is injected and the solution recirculated and tested again. This process is repeated three (3) times until all parameters are met. If, after the third test, the parameters are not met, an alarm will sound. System includes all controls, two (2) liquid neutralization injection pumps, two (2) detergent pick-up tubes, two (2) sets of 50-ft. tubing, pH probe, etc., and is piped and wired for automatic operation.

ACCESSORIES

☐ **BARRIER WALL FLANGE ASSEMBLY**

The washer is provided with a stainless steel trim flange to enclose the opening between one end of the washer and the masonry/ CMU wall opening.

☐ **Recessed one (1) wall**

☐ **Recessed two (2) walls**

☐ **MODULAR WALL**

A stainless steel modular wall assembly is designed and manufactured to enclose an open wall area or to create a wall barrier. All materials and fasteners are of stainless steel construction.

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A stainless steel modular wall assembly is designed and manufactured to enclose an open wall area or to create a wall barrier. All materials and fasteners are of stainless steel construction.

☐ Linear Feet

☐ Insulated

☐ 30" Access Door

☐ 30" Insulated Access Door

☐ **UNIVERSAL WASH RACK**

The washer is provided with a stainless steel rack to accommodate the washing of a wide range of vivarium components, including both mouse and rack cage bottoms, wire bar lids, filter tops and large animal pans. Custom configurations are also available upon request.

☐ **TRANSFER CART**

A stainless steel transfer cart is provided to transport racks when loading or unloading from the washer.

☐ **FEEDER BOTTLE BASKETS**

Stainless steel water baskets are provided for processing feeder bottles. Basket configurations to be determined by the customer.

☐ **PAN RACK**

The washer shall be provided with a stainless steel rack to accommodate the washing of process pans. The rack shall be a two- (2)-piece design for ease of loading and unloading. Rack capacity will depend upon pan length and width.

MATERIALS OF CONSTRUCTION

Standard Items - Materials

1. Base & Chamber Sump -	12 Ga. 304 S/S
2. Door Panels -	16 Ga. 304 S/S
3. Side and Top Panels -	14 Ga. 304 SS
4. Recirculation Valves and Components –	304 S/S
5. Internal Water and Steam Piping -	304 S/S
6. Drain Piping -	304 S/S
7. Drain Valving and Components -	304 S/S
8. Steam Piping External -	Schedule 80, Black Iron
9. Water Piping -	304 S/S
10. Spay Jets -	304 S/S
11. Steam Coils-	304 S/S
12. Treatment Pump -	304 S/S

Optional Items

13. Barrier Flange(s) -	20 Ga. 304 S/S
14. Modular Walls -	304 S/S

SPECIFICATIONS AND DRAWINGS ARE FOR GENERAL INFORMATION ONLY AND ARE SUBJECT TO CHANGE WITHOUT NOTICE UNLESS CERTIFIED BY FACTORY.