



Vivarium & Laboratory
Research Equipment



Activ



R700 Series High Efficiency Cage & Rack Washers

The BetterBuilt R700 Series Cage and Rack Washer reflects the current desire for high efficiency equipment which consumes less energy, increases productivity and promises sustainability for the future.

- Oscillating Manifold Spray Jet System
- Separate Wash and Rinse Solution Piping and Nozzles
- Touchscreen Control System
- Inflatable Door Gasket
- VHP or Chlorine Dioxide Decontamination Chamber Capabilities
- Self Cleaning Filter
- Low-Profile Base Allows for Shallow Pit or Floor Mounting
- Fast Cycles and Low Utility Consumption



T200 Series Tunnel Cage Washers

The BetterBuilt T200 Series Tunnel Cage Washer is the result of a progressive approach to washer design which combines cleaning performance, ease of use and long term durability to meet the demands of today's busy facilities.

- Noise Reduction, Quiet Operation
- Touchscreen Controls
- Easy Access to Filter Basket Screens
- Positive Connection Spray Manifolds
- Numerous Energy Saving Standard and Optional Features
- Patented Dryer Design for 99.9% Dry Cages
- Automated Loading and/or Unloading Systems
- Integration of Bedding Handling Equipment



G403 Series Multi-level Glassware Washer

The BetterBuilt G403 Series Multi-level Glassware Washer is available as a vertical lift single door configuration with a unique four level cantilevered loading and handling design ideal for laboratory glassware.

- Mirror Finished Chamber Interior
- Single Door, Vertical Lift
- Touchscreen Controls
- Removable Spray Racks
- Top and Bottom Mounted Rotary Spray Arms
- Loading Racks with Individual Spindle Jets
- Steam or Electric Heating Systems



G403PT Series Multi-level Glassware Washer

The BetterBuilt G403PT Series Multi-level Glassware Washer is available as a vertical lift two door pass-thru configuration with a unique modular multi-tiered loading and handling design ideal for laboratory glassware.

- Mirror Finished Chamber Interior
- Two Door, Vertical Lift, Pass Thru Design
- Touchscreen Controls
- Modular Multi-Tiered Loading Rack
- Top and Bottom Mounted Rotary Spray Arms
- Loading Racks with Individual Spindle Jets
- Steam or Electric Heating Systems
- Automated Glassware Handling System



G100 & G200 Series Glassware Washers

The BetterBuilt G100 and G200 Series of Glassware Washers are automatic, multi-cycle machines for undercounter or freestanding installations. Capable of cleaning on 1 to 2 levels using spray arms and/or spindle racks, with multiple configurations available for maximum capacity.

- Automatic Washing and Thermal Disinfection
- Programmable Washing Cycles
- Controlled Detergent Dispensing
- Wide Range of Washing Accessories

D900 Glassware Dryer

The BetterBuilt D900 Glassware dryer features a fan driven convection air pattern for uniform heat within the cabinet. This high speed dryer is a companion to our Glassware Washer model G302.

- Large Capacity Chamber
- Stainless Steel Adjustable Wire Shelves
- Digital Temperature Controls
- Optional Loading Track for Racks



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BF Series Bottle Fillers

The BetterBuilt BF Series Bottle Fillers provide uniform water delivery using either manual or automatic controls. All stainless steel construction, these units handle either 25 or 36 position common bottle baskets.

- Easy Glide Basket Slides
- Adjustable Height Manifold
- Removable Manifold for Cleaning Purposes
- Adjustable Automatic Fill Timer
- Custom Sizes and Configurations Available

B290 Series Manual Load Automatic Bottle Decapper

The BetterBuilt B290 Manual Load Automatic Bottle Decapper provides a consistent method of decapping water bottles, reducing worker fatigue and increasing productivity.

- Pneumatic Operation
- Bottle Caps Retained
- Bottle Basket Retainer Device Required
- Customizable to Suit Different Cap Types
- Automation Options Available



G302 Laboratory Glassware Washer

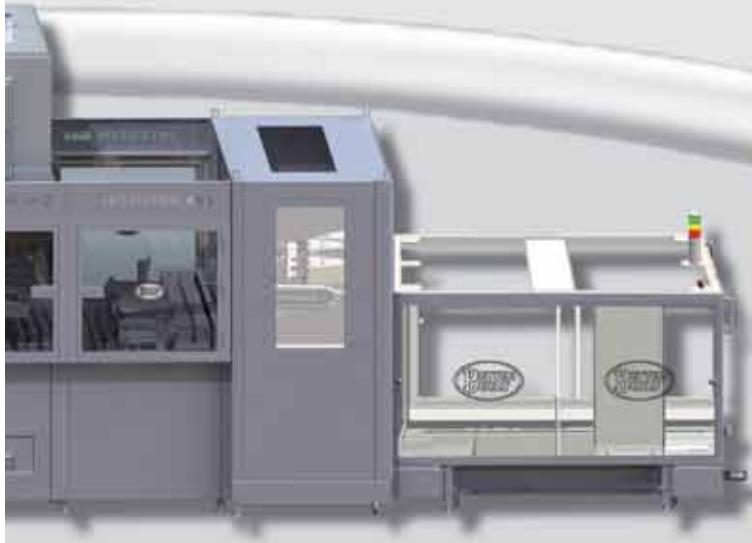
The BetterBuilt G302 Laboratory Glassware Washer provides heavy duty cleaning performance in a drop down door, single level, spindle header loading rack designed washer that will last for decades.

- Top and Bottom Mounted Rotary Spray Arms
- Two Chamber Sizes Available
- Steam or Electric Heating Systems
- Touchscreen Controls
- Numerous Spindle Header Loading Racks
- Single Drop Down Door

Activ™ Automation Solutions

We offer a wide variety of automated solutions to meet the challenges facing washing facilities in the laboratory and animal research industries. Our full range of automation solutions include:

- Activ™ Robotic Operating Solutions (ROS)
- Activ™ Integrated Automation Solutions (IAS)
- Activ™ Automated Dump Station (ADS)
- Activ™ Soiled Diverter Station (SDS)
- Activ™ Clean Diverter Station (CDS)
- Activ™ Automated Conveyor Systems (ACS)
- Activ™ View Data Collection & Control System
- Activ™ PM Component Usage & Operation Tracking



C200 Series

The BetterBuilt C200 Series Chute Bedding Dispenser is designed to accept rodent cages manually. Variable timed pneumatic valves simultaneously open to fill bedding into cages aligned beneath dispensing chutes. A precise controlled amount of fresh, free-flowing bedding materials is dispensed into each cage bottom.

- Precise Dispensing Controls
- Pneumatic Flap Valves
- Manually or Automatically Filled
- Optional Dust Collection System

D200 Series Automatic Bedding Dispensers

The BetterBuilt D200 Series Bedding Dispenser is an automatic, rain fall type, conveyor unit designed to dispense bedding into cages as they pass through the dispenser. This unit is designed to accept rodent cages as they are discharged from a tunnel cage washer, or as a stand-alone unit capable of handling most solid bedding materials.

- Rubber Coated Rollers, Minimize Noise
- O-ring Tension Design Drives Rollers
- Controlled Flipping of Cages with Patent Pending Device
- Integrated with Tunnel Cage Washer
- Manual Speed Controls for Rollers and Dispensing
- Safety Sensor on Bedding Hopper Lid
- Photo-Electric Sensor at Unload End





V700 Series Decontamination Chamber

The BetterBuilt V700 Series Decontamination Chamber is a heavy duty, single chamber, floor loading, and air tight chamber which provides a location for the decontamination of various laboratory items, equipment, materials, instruments and electronics. The integration of either Vapor Hydrogen Peroxide or Chlorine Dioxide generation equipment is provided.

- Modular Stainless Steel Construction
- Pneumatic Exhaust Damper
- Inflatable Door Gasket
- Ceiling Mounted Nozzles
- Internal Electrical Outlets
- Internal Distribution Fans
- Personnel Safety Features

MW Series Modular Walls

The BetterBuilt MW Series Modular Walls provide a barrier from unwanted sound, heat and contamination. The insulated panels are a solid, sturdy, easily installed system which is custom fabricated to suit site conditions.

- 3" Polyurethane Foam Injection
- 22 ga, Stainless Steel Covering on Both Sides
- Prefab Panels Connected with Cam-Locks
- Doors, Viewing Windows, Removable Access Panels



DD Series Downdraft Necropsy Tables

The BetterBuilt DD Series Downdraft Necropsy Tables provide an adjustable yet uniformed downward airflow, for full protection from strong fumes and odors.

- All Stainless Steel Construction
- Lift-out Hand Sink
- Perforated Work Surface
- Removable Air Baffles
- Cold Water Wash Down Capabilities
- Easy to Clean

R600 Series Cage & Rack Washer

The BetterBuilt R600 Series Cage and Rack Washer is the result of modern technology combined with a performance proven washer design. This approach delivers the cleaning performance, ease of use and long-term durability our washers are known for.

- High Pressure Overlapping Rotary Spray Arm System
- Choice of Four Models
- Touchscreen Controls
- Pit Mounted or Optional Floor Mounted Design
- Various Loading Racks Available
- Energy and Utility Saving Options
- Turbo Wash Option for Fast Cycle Times
- Custom Sizes and Configurations Available



C500 Series Cage & Bottle Washers

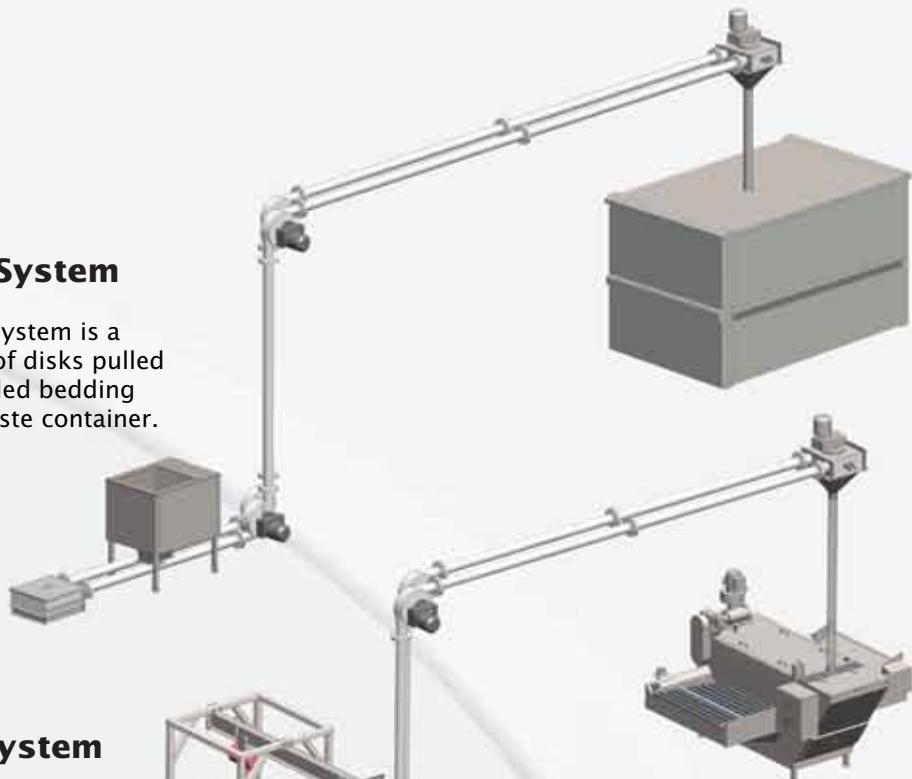
The BetterBuilt C500 Series Cage and Bottle Washer are designed for facilities that require a heavy duty washer with the same features as a floor mounted cage washer but in a smaller cabinet configuration.

- High Pressure Rotary Spray Arm System
- Choice of Cabinet Size and Door Configuration
- Touchscreen Controls
- Steam or Electric Heating System
- Loading Racks for Bottles or Cages



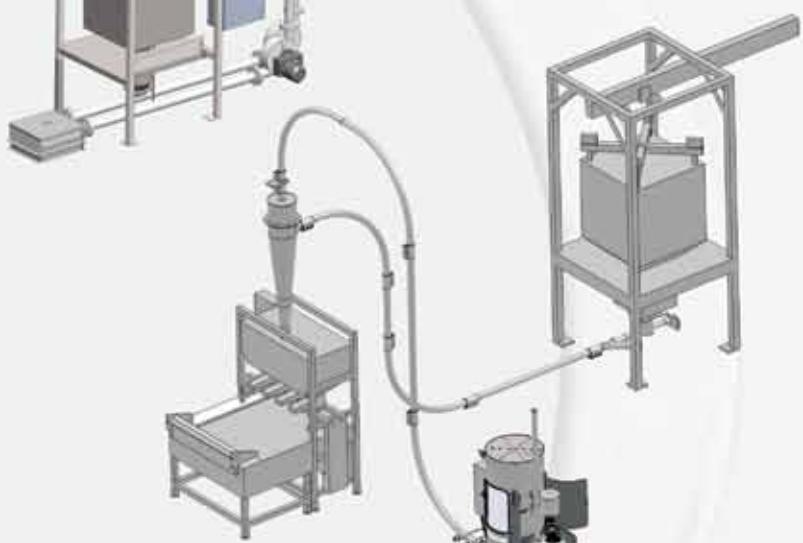
S200 Soiled Bedding Disposal System

The Sure-Flo™ S200 Soiled Bedding Disposal System is a tubular drag-chain using a continuous series of disks pulled through a transport pipe to convey moist soiled bedding and materials from a cage wash room to a waste container.



S210 Clean Bedding Delivery System

The Sure-Flo™ S210 Series Clean Bedding Delivery System is a tubular drag-chain conveying system designed to transport dry clean bedding within a cage wash facility to a bedding dispenser.



S270 Clean Bedding Delivery System

The Sure-VAC™ S270 Clean Bedding Delivery System is designed to pneumatically convey clean animal bedding from bulk storage to a bedding dispenser.



S260 Soiled Bedding Disposal System

The Sure-VAC™ S260 Soiled Bedding Disposal System is designed to pneumatically convey soiled bedding and materials from a cage wash room to a sealed vacuum waste container.

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R700 SERIES
HIGH EFFICIENCY
CAGE & RACK WASHERS

www.nsc-betterbuilt.com



R700 SERIES HIGH EFFICIENCY CAGE & RACK WASHERS

The BetterBuilt R700 Series Cage and Rack Washer reflects the current desire for high efficiency equipment which consumes less energy, increases productivity and promises sustainability for the future.

Oscillating Manifold Spray Jet System

Wash and rinse solutions are distributed throughout the wash chamber via 110 degree oscillating arms mounted horizontally along the sidewalls of the chamber. These spray jet manifolds with 160 wash nozzles and 100 rinse nozzles, plus 3 addition wash nozzles on the washer ceiling provide complete coverage.

Touchscreen Control Systems

A microcomputer with 8" TFT color touchscreen interface monitors and controls all aspects of the washer cycles and process operations. Unique features include adjustable multi-tiered password access, advanced diagnostics, alarm and data logging, parts list ID with visual reference assists maintenance and troubleshooting.

Maintenance and Replacement Parts

A preventative maintenance program is required for warranty purposes and is available from a local service agent. All BetterBuilt washers use microprocessor program controllers for long life and ease of service diagnostics. All components are non-proprietary and are available from local suppliers or the factory.

Alkaline and Acid Compatible

All BetterBuilt washers have a stainless steel cabinet and circulatory system, containing no plastic or rubber connections. This makes the washer compatible with all alkaline or acidic detergents and extends the operational life of the washer.

Safety Features

Personnel safety features include an emergency stop (e-stop) button located at each door. Inside the wash chamber, two highly visible emergency stop cables are located on both sides. The washer is equipped with a mechanical over-pressurization relief system.

Inflatable Door Gasket

Each door is equipped with a dual heavy-duty pneumatic lock and EPDM inflatable gasket to completely seal the cabinet door. With the addition of appropriate connections, the washer is capable of operating as a VHP / Chlorine Dioxide Sterilization Chamber.





Fast Cycle times Low Water Consumption

Separate heated and insulated storage tanks for wash and rinse solutions provide cycle times of 6 – 9 minutes for an alkaline wash and 10 – 15 minutes for an acid wash. By returning wash solution to the storage tank and re-using it for the next wash cycle, less energy, water and chemicals are consumed.

Aqua Pulse Spray

Spray emphasis from either side of the wash chamber is adjustable for duration and modulation frequency from side to side which optimizes chemical and water pressure performance during either the wash and/or rinse stage of a cycle.

Low-Profile Base

The 6" base allows the washer to be placed in a shallow pit or be floor mounted.

Reduce Cross Contamination

The washer sump is fully drained with a fresh water flush at the end of every rinse step. Dedicated piping for the wash and rinse solutions is also designed to reduce cross contamination.

Self Cleaning Filter

The double layer, 60 mesh, stainless steel automatic self-cleaning filter is located on the load side of the washer behind a lockable service door for easy access.

Automatic Cart-Lock Connection

The washer is equipped with a floor mounted; manifold coupling to divert wash/rinse solution through a bottle wash cart. The coupling connection is automatic to the accessory cart, no manual fastening required.

Load Bumper Rails

The washer chamber is provided with side rails and radius curbs which help center racks and protect the oscillating spray arms from damage during loading and unloading of the washer.

Optional Closed Circuit TV Camera

The 8" touch screen is capable of 32,000 colors of resolution which is perfect for an integral CCTV camera allowing operators on the loading side of the washer to view the clean side wash room area. Up to 4 CCTV cameras can be integrated into the touch screen controls package.



R700 SERIES HIGH EFFICIENCY CAGE & RACK WASHERS

APPLICATION

The BetterBuilt R700 Series washers are automatic, heavy duty, multi-cycle, single chamber, floor loading, hydrospray washers using an oscillating high-pressure spray system with heated, insulated solution storage tanks for fast cycle times, low utilities consumption and complete coverage.

MODEL	INTERIOR CHAMBER	EXTERIOR CABINET
	W x H x L	W x H x L
R730	48 x 88 x 90" 1219 x 2235 x 2286mm	92 x 108 x 97.5" 2337 x 2743 x 2477mm

Note: Model with acid tank - exterior cabinet dimensions are 117.25 x 108 x 97.5". Due to continued engineering improvements, specifications are subject to change without notice.

STANDARD FEATURES

- Single Door Cabinet
- Pit Mounted or Floor Mounted, Low Profile 6" Base
- All Stainless Steel Construction
- Insulated Double Wall Cabinet and Door
- Manual Swing-out, Hinged Doors
- Inflatable Door Gasket for Positive Seal
- Air Piston Door Lock
- Stainless Steel Perforated Floor in Lift-up Sections
- Stainless Steel Pump and Circulatory Piping
- Stainless Steel Tank Steam Coil Heating
- Automatic Tank Level Control
- Stainless Steel Heated Alkaline and Final Rinse Tanks
- Oscillating Manifold Spray Jet System
- Dedicated Wash and Final Rinse Piping, No Cross Contamination
- Automatic Cart Lock System for Bottle Washing Carts
- Adjustable Spray Patterns
- Temperature Guarantee During All Cycle Phases

- Automatic Self-Cleaning Filter System
- Drain Discharge Cool Down
- Interior Bumper Rails, Radius Curbs
- Chemical Injection Ports, Contacts and Fittings
- Pneumatic Operated Exhaust Damper
- Illuminated Chamber Interior
- Automatic Multi Phase Treatment Cycles
- Multi-cycle Microprocessor Control System
- 8 Fully Adjustable Programmed Cycles
- 8" TFT Color Touchscreen Control Panel
- Stainless Steel Control Guard
- Program Security via Pin Number Access
- Built-in Advanced Diagnostics
- Interior Emergency Stop Cable on Both Sides
- Emergency Stop Button at Door(s)
- Service Side Exterior Stainless Steel Panels
- Non-proprietary Components

OPTIONAL FEATURES

- Double Door Pass Thru Cabinet
- Left or Right Side Service Access
- Barrier Wall Trim to Close Wall Openings
- Seismic Anchoring
- Water Supply Temperature Booster
- Vapour Removal Condenser
- Power Exhaust Stainless Steel Blower
- Convection Air Dryer System
- Automatic Chemical Injection Pumps, Time Based
- pH Neutralization for Effluent
- Low Level Chemical Sensor
- Sampling Port
- Direct Facility Rinse
- Stainless Steel Heated Acid Tank

- Automatic Water Rack Flushing System
- VHP / Chlorine Dioxide Sterilization Capability
- Ethernet Connectivity to PLC or Touchscreen
- Factory Ethernet Connectivity for Online Diagnostics
- Modem Connectivity for Factory Diagnostics
- PLC and Touchscreen Program Backup
- Compact Flash Card for Data Collection
- RS485 Port for Data Download
- Impact or Thermal Cycle Data Printer
- Printer Cover
- CCTV Capability for Unload Side Camera
- Surge Protection
- Clean Side Buzzer
- Knocked Down Shipment

ACCESSORIES

BWC-9	Bottle Wash Cart	VHS-9-RD	Vertical Cage Rack	UMR-9	Universal Mixed Rack
UC-6	Universal Cart	SPR-9	Split Processing Rack	MPR-9	Mice Processing Rack
UBC-6	Universal Basket Cart	UPR-9	Universal Processing Rack	ITR-6	Interior Tilt Rack

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Quotation: P5510(2)

24-Aug-20

R730 (2)

To: Dr. Saeed M. Al Sadek

Project:

Mobark Saeed Oun Trade Est.

King Saudi University Animal House

Madinah Road Tower Buliding Sec.Floor Office No:

Jeddah, Saudi Arabia

Cage and Rack Washer Model R730 (#709-00001)

Interior Cabinet Size: 48" wide x 88" high x 90" long

Standard Features

- Pit Mounted or Floor Mounted on 6" base
- All Stainless Steel Construction
- Insulated Double Wall Cabinet and Door(s)
- Manual Swing-out Hinged Door(s)
- Stainless Steel Floor Grating in Lift-up Sections
- Stainless Steel Pump and Circulatory Piping
- Oscillating Manifold Spray Jet System
- Dedicated Wash and Final Rinse Piping
- Adjustable Spray Patterns
- Stainless Steel Steam Coil Side Tank Heating
- Temperature Guarantee During All Cycle Phases
- Drain Discharge Cool Down
- Fully Drained and Flushed Solution Sump
- Automatic Tank Level Control
- Pneumatic Operated Exhaust Damper
- Inflatable Door Gasket for Positive Seal
- Air Piston Door Lock
- Heated Alkaline and Rinse Solution Side Tanks
- External Self Cleaning Debris Filter
- 5 Chemical Injection Ports, Contacts and Fittings
- Interior Side Bumper Rails and Radius Curbs
- Interior Emergency Stop Cable, Both Side
- Illuminated Chamber Interior
- Emergency Stop Button at Door(s)
- Automatic Multi-phase Treatment Cycles
- 8 Fully Adjustable Programmed Cycles
- Multi-cycle Microprocessor Control System
- 8" TFT Color Touchscreen Control Panel
- Stainless Steel Control Guard
- Program Security via Pin Number Access
- Built-in Advanced Diagnostics
- Non-proprietary Components

QTY:

1

Base Price, Includes All Standard Features

709-00001

Options Added to Base Price are Listed Below

EQUIPMENT CONFIGURATION

Cabinet Options:

Two door pass thru / Trim around door fascia on both sides

Spray System Options:

Cartlock Manifold connection

EQUIPMENT OPTIONS

Heating Options:

Steam Side Tank Coils

Exhaust / Ventilation Options:

POV collar with pneumatic vent damper for direct connection to HVAC

Storage System Options:

Alkaline heated recirculated storage tank



Quotation: P5510(2)

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Jeddah, Saudi Arabia

Project:

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Cage and Rack Washer Model R730 (#709-00001)

Final rinse tank, heated. Rinse water not re-used	
Chemical / Detergent Options:	
Three peristaltic chemical pumps	
Signal only to start pumps supplied by chemical vendor	
Misc. Options:	
Service Side:	
Equipment Total	\$216,214.00
Knock Down Ready for Shipment	\$3,797.00
(One BetterBuilt Personnel Installation Supervision Assistance - 4 day(s) Install	\$12,742.00
(One BetterBuilt Personnel Startup Assistance - 2 day(s) only) Startup	\$10,534.00
Total	\$243,287.00
Accessories and Loading Equipment : add as required	QTY
BWC9 Bottle Washing Cart with rotary spray #209-50100	2
R-4-10 Universal Basket Rack for cages, accessories #206-50206	3
Accessories Sub-total	\$35,550.00
Total Investment	\$278,837.00



R730 MODEL CAGE & RACK WASHER

PRODUCT DESCRIPTION

The BetterBuilt R730 cage and rack washer is the result of modern technology providing a heavy duty, automatic, single chamber, floor loading, hydro-spray washers. These units can be configured with a single door or with two-doors for pass through applications. Units may be floor or pit mounted, flush with one wall, two walls or installed free standing. The service access and control panel can be positioned on either the left or the right side of the load door to suit room layout and equipment flow considerations.

APPLICATION

To clean, sanitize and dry cages, racks, utensils, mobile equipment, and feeder bottles used in the care and housing of research animals.

STANDARDS¹

- Certified to UL 61010-1 Ed:2 UL Standard for Safety Electrical Equipment For Measurement, Control, and Laboratory Use by a third party inspection agency - ETL.
- Certified to CSA C22.2 No. 61010-1 Ed:2 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use by a third party inspection agency - ETL.
- Evaluated and conforms to IEC 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use by a third party inspection agency - ETL.
- Evaluated and conforms to CENELEC EN 61000-6-4 Electromagnetic Compatibility (EMC) – Part 6-4 Generic Standards – by a third party inspection agency - ETL.
- Evaluated and conforms to CENELEC EN 61000-6-2 Electromagnetic Compatibility (EMC) – Part 6-2 Generic Standards – by a third party inspection agency - ETL.
- Evaluated and conforms to IC ICES-003 & FCC CFR47 Part 15/B Report Measurements by a third party inspection agency - ETL.



Model	Chamber W x H x L	Overall W x H x L	Pit W x L x D
R730	48 x 88 x 90" 1219x2235x2286 mm	91 x 115 x 96" 2311x2921x2438 mm	96.5 x 100 x 7.5" 2451x2540x191 mm

1.0 STANDARD FEATURES

1.1 Low Profile Base

The standard unit configuration includes a low profile 6" high base to accommodate facilities with shallow pit requirements or for floor mounting the washer.

1.2 Construction - Cabinet

The base, washing chamber, detergent holding tank(s), rinse tank, and piping delivery systems are made from welded type 304 stainless steel construction. All pumps are made of 316 grade stainless steel. No rubber or plastic hoses, clamps, or copper piping is used.

The chamber sections are flanged and are bolted together with neoprene sealer between the mating flanges. Base shall contain integral door gutters, water collection sump area and floor grating supports. The top and sides of the

¹ Steam units only



R730 MODEL CAGE & RACK WASHER

washer are insulated with expanded polystyrene covered by a protective stainless steel jacket.

1.3 Smooth Sided Chamber Interior

The wash chamber is designed with smooth side wall construction and radius corners to reduce areas where gross debris may accumulate. All interior and exterior joints are sealed to prevent leakage from the chamber.

1.4 Manual Swing-out, Hinged Doors

The unit is provided with manually operated, swing out, side hinged, and cabinet type door.

1.5 Construction - Doors

Each door is built using double wall construction, insulated with expanded polystyrene, equipped with an inflatable sealing gasket, heavy duty stainless steel hinges, and a double-glazed tempered glass observation window.

1.6 Positive Door Seal System

The unit is provided with an inflatable gasket to completely seal the cabinet door(s). Each door has a dual heavy-duty pneumatic lock to ensure the cabinet cannot be opened while in use. To maintain soiled/clean barrier status, only one door can be opened at any given time.



Figure 1: Positive Door Seal

1.7 Stainless Steel Chamber Floor Grating

The chamber floor consists of heavy-duty stainless steel grating sections covering the entire floor area with wheel guides to insure proper positioning of the presentation or cage rack relative to the wash/rinse spray nozzles. Grating sections are equipped with drop-in handles for easy removal without the use of tools.

1.8 Stainless Steel Pump and Circulatory Piping

All pumps, piping, components, and valves that come in contact with the re-circulated treatment solutions are supplied in stainless steel at no additional cost to the client.

1.9 Fast Cycle Times

The BetterBuilt R700 holds wash and rinse solutions in two heated, insulated storage tanks. Once a cycle is selected and the start button pressed, the washing process begins with no solution heat up time. Cage wash treatment chemicals are effective at wash temperatures of 180°F/82°C allowing decontamination of cages during the chemical wash stage. A fresh hot water rinse follows to remove residual chemical and further enhance bacteria reduction. Typical cycle times will be 6-10 minutes for an alkaline wash cycle or 11-15 minutes for an acid cycle.

1.10 Oscillating Jet Spray System

The wash/rinse chamber is provided with ten (10) self-draining oscillating arms mounted horizontally along the sidewalls of the chamber. Stainless steel spray jets with separate piping for wash (160 nozzles) and rinse (100 nozzles). Total of 260 spray jets. The oscillating system is driven by an air cylinder housed external to the wash/rinse chamber that will provide 110° oscillation. The air cylinder is provided with micro switches to guarantee it achieves its full stroke.



R730 MODEL CAGE & RACK WASHER

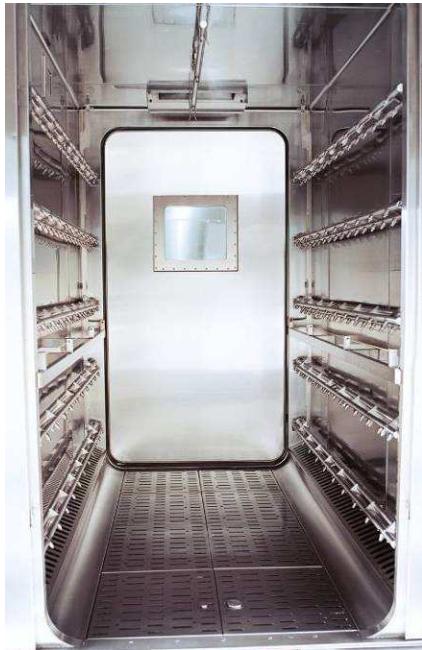


Figure 2: Oscillating Jet Spray System

1.11 Aqua Pulse Spray System

For facilities where soiled loads can be more heavily concentrated on one particular side of the load, each program can be customized to take advantage of the washer's capability for custom spraying patterns. Spray emphasis from either side of the wash chamber is adjustable for duration and modulation frequency from side to side. Custom spraying can be done for both the Wash and Rinse phase.

1.12 Treatment Temperature Guarantee

The selected wash and/or rinse treatment periods will not begin timing until the wash and/or rinse treatment solution temperature reaches the desired set point assuring a minimum temperature during the treatment period.

Each treatment period can be guaranteed for temperature and time with set points locked in by supervision to insure security.

The wash/rinse treatment cycle will not begin until the solution temperature in the wash/rinse tank has reached the preset value.

1.13 Drain Discharge Cool Down System

Cold water is automatically injected into the drain discharge to lower the discharge temperature to below 140°F while discharging to the building drain system.

1.14 Machine Sump

The chamber's collection sump is equipped with its own transfer pump to return all solutions from the chamber to the wash reservoir. The sump has no openings beyond the base of the machine to emit vapors from the re-circulating solutions. The machine's sump is fully drained after each cycle, to reduce cross contamination.

1.15 Fully Drained and Flushed Solution Sump

Following the completion of rinse phase(s) the chamber sump is transferred to the appropriate wash storage tank, and residual chamber solution is gravity drained or can be power drained based upon site conditions. The drain line is left open for a short duration to allow for the sump to drain, eliminating debris and residue carryover.

1.16 End of Day Cycle

Depending on the usage of the washer, the operator may select this cycle on a weekly basis. During this cycle each storage tank is individually neutralized, re-circulated and tempered to desired drain temperature. The recirculation process is stopped, the external filter is back flushed and all solution tanks are gravity drained.

1.17 Automatic Tank Level Control

The washer is provided with an automatic low, high and alarm overflow level control for the heated storage tanks to insure each tank is filled to the proper level before the pump starts. Design prevents over-filling and is included with an overflow high float switch and an overflow to the drain.

1.18 Stainless Steel Automatic Damper

The washer chamber is provided with a stainless steel exhaust vent damper with pneumatic



R730 MODEL CAGE & RACK WASHER

actuator in the exhaust line. An electrical signal to the facility's HVAC system is provided.

1.19 Stainless Steel Steam Coil Tank Heating

The holding tanks are provided with a steam heated, stainless steel, tubular coil which is capable of increasing and/or maintaining solution temperature as it re-circulates within the wash chamber.

The heating coils are sized adequately to operate with a maximum incoming steam pressure of 80 psig. The steam coil is designed to ASME Section VIII, Div. 1, Unfired Pressurized Vessel Code.

Steam coils have flanged connections within the tanks to allow removal for servicing.

A thermostatic steam trap and condensate return line is provided.

1.20 Wash Solution Holding Tank

A separate alkaline wash solution holding tank, piping and pump are provided to deliver heated alkaline wash solution to the oscillating spray system. Wash solution can be automatically returned to the holding tank or directed to drain after each cycle.

The wash solution holding tank(s) has a minimum 80 gallon (300 liter) capacity and is heated by a stainless steel steam coil or an optional electric heating element. Each holding tank is equipped with an automatic digital temperature controller, automatic water fill, automatic water high, low and overfill level control, automatic drain valve, and overflow piping. Solution temperature is monitored and displayed on the operator interface Touchscreen.

1.21 Rinse Solution Holding Tank

A separate rinse solution holding tank, piping and pump are provided to deliver fresh heated rinse solution to the oscillating spray system. The non re-circulated rinse solution is returned to the appropriate wash storage tank to re-fresh

the wash solution or directed to drain after each cycle.

The rinse solution holding tank has a minimum 80 gallon (300 liter) capacity and is heated by a stainless steel steam coil or an optional electric heating element. The rinse solution holding tank is equipped with an automatic digital temperature controller, automatic water fill, automatic water high and low level control, automatic drain valve, and overflow piping. Solution temperature is monitored and displayed on the operator interface touchscreen.

1.22 Wash Recirculation Pump

The treatment solutions are re-circulated under pressure from a 10HP pump with mechanical seal. The re-circulated wash solution is sprayed into the chamber from a heated wash storage tank(s) through dedicated pipe work to reduce cross contamination. The pump is capable of 250GPM at 45PSI pressure.

All wetted surfaces of the pump are Type 316L stainless steel. The pump motor is totally closed, fan cooled (TEFC) with starter, overload protection, and sealed bearings requiring no lubrication.

1.23 Rinse Pump

The rinse solution is pumped to the rinse spray system under pressure from a 3HP pump with mechanical seal. The non re-circulated rinse solution is sprayed into the chamber from the heated rinse storage tank through dedicated pipe work to reduce cross contamination. The pump is capable of 40GPM at 45PSI pressure.

All wetted surfaces of the pump are Type 316L stainless steel. The pump motor is totally closed, fan cooled (TEFC) with starter, overload protection, and sealed bearings requiring no lubrication.



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1.24 Transfer Pump

A 5HP transfer pump is used to transfer re-circulated solution from the sump back to the appropriate wash storage tank during the wash and rinse stage.

All wetted surfaces of the pump are Type 316L stainless steel. The pump motor is totally closed, fan cooled (TEFC) with starter, overload protection, and sealed bearings requiring no lubrication.

1.25 External Self Cleaning Debris Filter

A stainless steel automatic self-cleaning filter shall be provided in the recirculation piping. The filter shall be a minimum 102 mm (4") diameter x 805mm (20") and manufactured from perforated stainless steel. The filter is piped in-line with, and operates in conjunction with, automatic valves to collect debris during the treatment portion of each cycle and direct debris to the drain once each cycle is complete.



Figure 3: External Self Cleaning Debris Filter

1.26 Chemical Injection Ports, Contacts and Fittings

Each wash solution tank is provided with two (2) injection ports, three (3) monitoring ports, and electrical signals for optional or owner supplied detergent dispensing and chemical treatment pumps. All penetrations to the staging tanks for detergent, acids or neutralizers are constructed

using a stainless steel spigot welded at an angle to the unit's chamber.



Figure 4: Chemical Ports

1.27 Interior Bumper Rails

The washer chamber is provided with internal rub bars/guards to protect the oscillating spray arms from damage when the washer is loaded and unloaded.

1.28 Interior Emergency Stop Cables

For operator safety two emergency stop cables are mounted inside the washer on each and run the length of the chamber.

1.29 Illuminated Chamber Interior

The interior of the chamber shall be illuminated by exterior mounted compact fluorescent light fixture. Illumination is through a sealed tempered glass window to the interior space.

1.30 Emergency Stop Button

One emergency stop button is located at the control panel found next to each door.

1.31 Safety Features

Each machine is provided with the following safety features:

- Each door is fitted with an electronically controlled, pneumatic latch preventing the machine from being opened during the



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cycle. If the operator terminates the cycle via the touchscreen, all machine operation is terminated prior to the system unlatching the door. To resume operation door must be closed and start button pressed and held until cycle initiation.

- Red emergency stop pushbuttons are located on both the load and unload side of the washer. When the pushbutton is pressed, machine shall immediately cease all operations. To resume operation, all emergency stop buttons must be returned to their non-energized state and the cycle reinitiated from the exterior touchscreen interface.
- The chamber interior is provided with a pull cable system mounted along both sides of the interior cabinet. The cable is a plastic coated stainless steel braided cable installed inside the full length of the chamber enabling the washer to be immediately stopped from the interior by pulling the cable mechanism. The soil side door latch will unlatch and the inflatable door gasket will deflate. An audible alarm will annunciate upon activation of interior shut down system. The cable pull switch must be reset and cycle power to the washer before restarting.
- The washer is equipped with a mechanical over-pressurization relief system. In the event that there is an over-pressurization of the chamber, the build up in pressure will be released through an explosion relief vent. The appropriate alarms will be displayed on the control system.
- A sensor is located on the external filter in the event that the filter tri-clamp has not been re-installed, the washer will not operate and the appropriate alarms will be displayed.

1.32 Automatic Multi-Phase Treatment Cycles

The standard treatment cycle consists of the following phases: Alkaline Wash, Rinse and Exhaust/Dry. However, if the washer is equipped with an optional Wash 2 (Acid)

storage tank; the treatment cycle can consist of: Alkaline Wash, First Rinse, Acid Wash, Second Rinse and Exhaust/Dry stage. All cycle phases can be selected or de-selected with Supervisory access. All cycle phases are adjustable. The cycle once activated is completely automatic. The washer is capable of automatically executing the selected, pre-programmed cycle using any or all of the following phases:

- **Alkaline Wash**
Hot alkaline solution from alkaline reservoir is pumped into the chamber through the dedicated wash nozzle delivery system. Alkaline solution is returned to the alkaline reservoir tank. The wash time is programmable from 0000 – 9999 seconds with a standard time of 240 seconds. The wash temperature is programmable up to 185°F / 84°C.
- **Alkaline Rinse**
Fresh, hot water from the rinse reservoir is pumped into the chamber through the dedicated rinse nozzle delivery system. Used rinse water is pumped to the alkaline wash reservoir as only fresh water is used every rinse cycle. The total rinse time is programmable up to 120 seconds with a standard duration of 40 seconds and the temperature is programmable up to 190°F / 88°C.
- **Drain**
During this time, the self-cleaning filter is back flushed with fresh cold water to ensure debris removal and the washer sump is gravity drained. This drain time has a programmable duration.
- **Acid Wash (optional)**
Hot acid solution from the acid reservoir is pumped into the chamber through the same dedicated wash nozzle delivery system as for the alkaline wash. Acid solution is returned to the acid reservoir tank. The wash time is programmable from 0000 – 9999 seconds with a standard time of 180 seconds. The wash temperature is programmable up to 140°F / 60°C respectively.



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- **Acid Rinse (following optional acid wash step)**
Fresh, hot water from the rinse reservoir is pumped into the chamber through the dedicated rinse nozzle delivery system. Used rinse water is pumped to the acid wash reservoir as only fresh water is used every rinse cycle. The total rinse time is programmable up to 120 seconds with a standard duration of 40 seconds and the temperature is programmable up to 190°F / 88°C.
- **Drain (following optional acid wash step)**
Neutralization liquid detergent is introduced prior to the washer sump gravity drain stage. Also, during this time the self-cleaning filter is back flushed with cold water to ensure debris removal. This drain time has a programmable duration.
- **Exhaust**
The machine stands idle for a sufficient length of time to remove residual steam vapor from within the chamber. Vapor exhaust is programmable from 0000 – 9999 seconds with a typical time of 120 seconds.
- **VHP or CD Phase (optional)**
The machine can be configured to accept a Bioquell hydrogen peroxide Clarus L or ClorDiSys treatment unit. The actual hydrogen peroxide or ClorDiSys unit can be purchased under separate contract from Bioquell/ClorDiSys or directly through Northwestern Systems Corporation.

1.33 Multi-cycle Microprocessor Control System

A microcomputer with 8" touchscreen interface monitors and controls all aspects of the washer cycles and process operations.

Standard eight (8) fully adjustable programmed cycles come with the unit. The PLC comes with battery backup of the microcomputer memory in the event of a power failure.

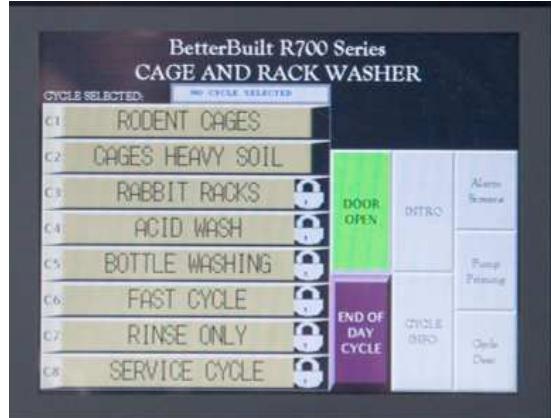


Figure 5: Cycle Selection Screen

1.34 Cycle In-Progress

The large 8" touchscreen displays all current cycle data information.



Figure 6: Cycle In-Process Screen



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1.35 Stainless Steel Controls Guard

The unit is provided with a stainless steel guard to protect the touchscreen and controls from inadvertent damage.



Figure 7: Stainless Steel Control Guard

1.36 Multi-Language Support **NEW!**

The Touchscreen is able to display in multiple languages. The languages to be supported are English, French, Chinese, Korean, and Spanish. If there are other languages desired, please contact BetterBuilt Sales Department.

1.37 Program Security

The controls come standard with the "Advanced Adjustable Multi-Tiered Password Protection System". Cycle programming is set by supervisory personnel to insure process and cycle security. Treatment times, temperature settings, and other key cycle parameters are programmable. A tiered password system is available for incremental access to the various program parameters. As the operator comfort and confidence level increases, supervisory personnel can grant increased security access to specific program parameters.

	Time/ Temp	Cycle Time	Cycle Data	Adj/ Cal	No.ID	Pass	CYCLE DATA MOD
Password 1	NO	NO	NO	NO	NO	0000	
Password 2	NO	NO	NO	NO	NO	0000	
Password 3	NO	NO	NO	NO	NO	0000	
Password 4	NO	NO	NO	NO	NO	0000	
Password 5	NO	NO	NO	NO	NO	0000	
Password 6	NO	NO	NO	NO	NO	0000	
Password 7	NO	NO	NO	NO	NO	0000	
Password 8	NO	NO	NO	NO	NO	0000	
Password 9	NO	NO	NO	NO	NO	0000	
Password 1	NO	NO	NO	NO	NO	0000	
MASTER	NO	NO	NO	NO	NO	0000	

Figure 8: PROGRAM SECURITY: Supervisor Tiered Password Screen

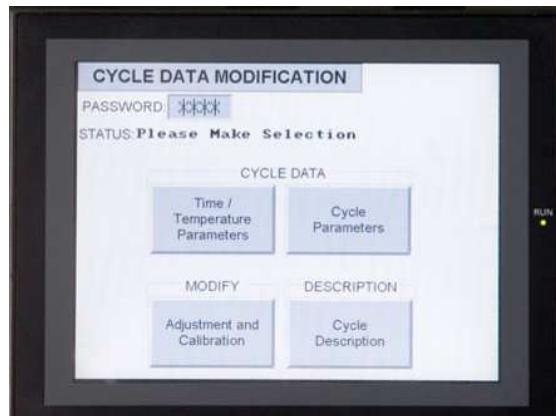


Figure 9: Cycle Data Modification Screen

1.38 Built-in Advanced Diagnostics

The controls feature several advanced diagnostics features beyond competitive systems to include:

- Advanced Alarm and Data Logging
- Advanced Diagnostics
- Advanced Maintenance and Troubleshooting
- Parts List ID and Visual Reference
- Technician Mode Coordinated I/O Charts
- Chemical Pump Priming function

1.39 Advanced Alarm and Data Logging

This program feature provides user friendly Alarm log, recovery, and checking screens. Additionally, an alarm popup box with



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description and possible causes for the fault are integrated into the touchscreen.

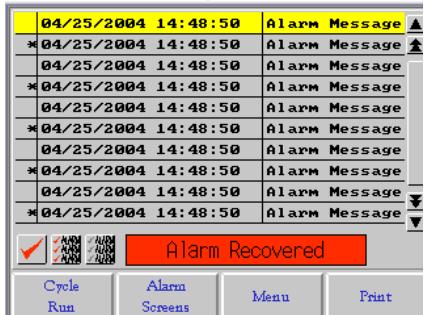


Figure 10: ADVANCED ALARM AND DATA LOGGING: Alarm Log and Recovery Screen

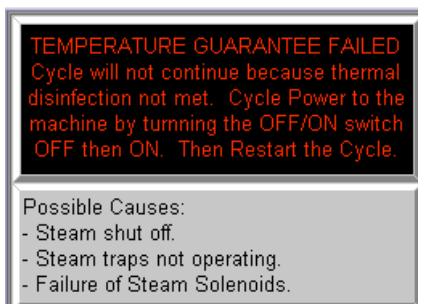


Figure 11: ADVANCED ALARM AND DATA LOGGING: Alarm Message Help Screen

1.40 Advanced Diagnostics

The control program is provided with a graphical P&ID flow chart with real-time integrated service flow and Input/Output Summary screen allowing operators and service personnel quick access to machine function status.

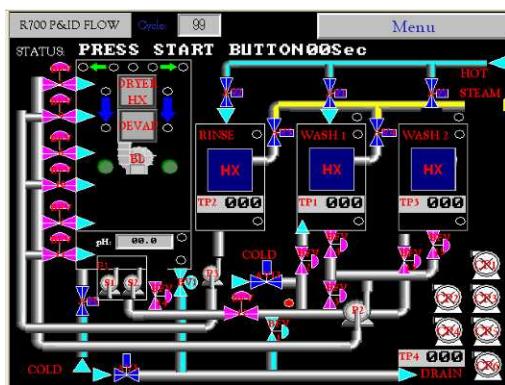


Figure 12: ADVANCE DIAGNOSTICS - P&ID Chart with Real-time Integrated Service Flow

1.41 Advanced Maintenance and Troubleshooting

The control program is also provided with an integrated P&ID chart screen with touch cell descriptions and an image based Service View screen with touch cell descriptions, providing operators and maintenance personnel a quick visual reference to parts and their descriptive information.

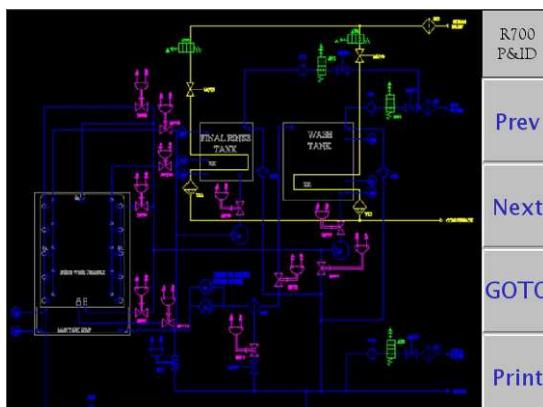


Figure 13: ADVANCED MAINTENANCE & TROUBLESHOOTING:

1.42 Parts List ID and Visual Reference

The control program is provide with a Parts List Identification screen complete with pop up visual reference , symbols, and part # ID to assist operators and maintenance personnel with troubleshooting activities.

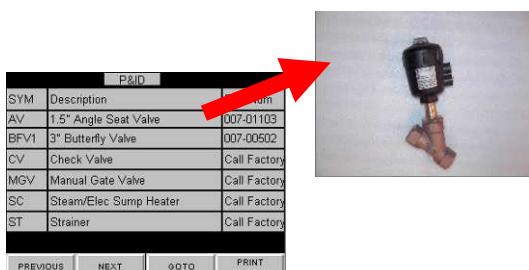


Figure 14: PARTS LIST ID & VISUAL REFERENCE: Parts List ID Screen

1.43 Technician Mode Coordinated I/O Charts

In the Service/Technician Mode, Technicians are provided the access to coordinated, color coded descriptive information, I/O status, wire number designations, I/O module color for each of the inputs and outputs of the system.



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TECHNICIAN MODE		TECHNICIAN MODE	
MAIN WATER INLET VALVE [AV5]	OP	DINP/CO2 TANK [D12-128]	OP
Main Water Solenoid Valve [SV1]	OP	Main Wash Pump Motor Controller	OP
Drum Motor Controller	OP	Drum Pump Motor Controller [SV10]	OP
Drum Pump Motor	OP	Drum Heater Controller	OP
Drum Heater	OP	Hot Water Fill Solenoid [SV11]	OP
Door Sensor - Solid Side Closed [S1]	OP	Hot Water Fill Pump [PV2]	OP
Door Status - Clean Side Closed [S2]	OP	Water Filter Pump [PV3]	OP
Door Status - Clean Side Open [S3]	OP	Water Filter Fwd Solenoid [SV2]	OP
Door Status - Dirty Side Closed [S4]	OP	Water Filter Rev Solenoid [SV3]	OP
Door Status - Dirty Side Open [S5]	OP	Water Filter Rev Pump [PV4]	OP
PREVIOUS	NEXT	GOTO	PRINT SCREEN

TECHNICIAN MODE		TECHNICIAN MODE	
MAIN WATER INLET VALVE [AV5]	OP	DINP/CO2 TANK [D12-128]	OP
Main Water Solenoid Valve [SV1]	OP	Low Level Water Pressure [SV11]	OP
Low Level Water Pressure [SV11]	OP	Low Level Water Pump [PV1]	OP
Start Light	OP	Chemical Pump 1	OP
Drum Light	OP	Chemical Pump 2	OP
Door Light	OP	Chemical Pump 3	OP
Skid Side Door Open Signal	OP	Chemical Pump 4	OP
Skid Side Door Open Signal	OP	Chemical Pump 5	OP
Button 101.15	OP	Chemical Pump 6	OP
Button 101.15	OP	Button 101.15	OP
PREVIOUS	NEXT	GOTO	PRINT SCREEN

Figure 15: TECHNICIAN MODE I/O CHART

1.44 Statistics Mode and Active PM *NEW!*

The control system is provided with a statistics mode that keeps track of a wide variety of parameters. Parameters such as per Cycle Usage, Total number of Cycles Operated, Hours of Operations, and much more.

GENERAL STATISTICS			
Cycles	OP	PM Sch	
Cycle 1	0000000	0000000	Reset
Cycle 2	0000000	0000000	Reset
Cycle 3	0000000	0000000	Reset
Cycle 4	0000000	0000000	Reset
Cycle 5	0000000	0000000	Reset
Cycle 6	0000000	0000000	Reset
Cycle 7	0000000	0000000	Reset
Cycle 8	0000000	0000000	Reset
PREVIOUS	NEXT	GOTO	PRINT SCREEN

Figure 16: General Statistics Screen

In addition to the recording of general statistics, this mode can be used to forecast a PM (Preventative Maintenance) Schedule, referred to as Activ™ PM. Each component is actively monitored for usage so that scheduled Preventative Maintenance programs will be more proactive. The control system will alert the maintenance personnel through a data log when each individual component has reached their anticipated life expectancy.

STATISTICS			
24VDC OUTPUT CARD (16-23)		OP	PM Sch
Main Water Inlet Valve [AV5]	0000000	0000000	Reset
HX Steam Inlet Valve [AV1]	0000000	0000000	Reset
Final Spray Valve [AV6]	0000000	0000000	Reset
Dryer Steam Coil Valve [AV2]	0000000	0000000	Reset
Rinse Inlet Water Valve [AV7]	0000000	0000000	Reset
Rinse Steam Stump Coil Valve [A]	0000000	0000000	Reset
Rinse Gravity Drain Valve [BFV]	0000000	0000000	Reset
Wash Inlet Water Valve [AV8]	0000000	0000000	Reset
PREVIOUS	NEXT	GOTO	PRINT SCREEN

Figure 17: Activ PM Screen

1.45 Chemical Pump Priming Function

The control program is provide with a Chemical Pump Priming screen to allow supervisory and chemical agent personnel the ability to pre-program an adjustable time for chemical pump priming during chemical drum change out procedures. Feature insures that chemical lines are primed with chemical prior to washer operations during the cycle process.

CHEMICAL PRIMING			
CHEMICAL PUMP 1:	OFF	00	00
CHEMICAL PUMP 2:	OFF	00	00
CHEMICAL PUMP 3:	OFF	00	00
CHEMICAL PUMP 4:	OFF	00	00
CHEMICAL PUMP 5:	OFF	00	00
CHEMICAL PUMP 6:	OFF	00	00
START SCREEN			

Figure 18: CHEMICAL PUMP PRIMING FUNCTION: Chemical Priming Screen

1.46 Non-proprietary Components

All components are non-proprietary and are available from local suppliers or from the factory.



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2.0 CONFIGURATION OPTIONS

2.1 Single or Two Door Pass-Thru

The washer is available in a single door configuration or as a two door pass-thru. The unload end is provided with an operator status interface.

2.2 Left or Right Side Service Access

The unit comes standard with a choice of either left or right side service access.

2.3 Dual Enlarged Viewing Windows *NEW!*

The standard viewing window located in our door is replaced with dual enlarged viewing windows 20" W x 26" H which provide extra visibility into the chamber.

2.4 Barrier Wall Trim to Close Wall Openings

Stainless steel trim strips and flanges are provided for recessed wall openings or at barrier wall enclosures

2.5 Seismic Anchoring

Washer is provided with seismic anchoring brackets designed in accordance with local seismic codes.

2.6 Automatic Cart-Lock Connection

The washer is provided with a floor mounted, manifold coupling system to divert wash/rinse solution through a bottle wash carts. The coupling connection is automatic to the accessory cart when the cart is positioned into the washer. The manifold flange connection is made without manual fastening by the operator.

2.7 Automatic Tilt Floor

For loads with horizontal surfaces which pool water, the automatic tilt floor will elevate on one side thus allowing horizontal surfaces to drain.

3.0 EQUIPMENT OPTIONS

3.1 Exhaust Vapor Removal Condenser

A cold water vapor condensing unit is provided to reduce excessive vapor and cool the exhaust air prior to entering the building's exhaust system.

3.2 Stainless Steel Exhaust Fan

The washer is provided with a fan inter-wired with the automatic control system to exhaust residual vapors from the unit to building HVAC. The fan assembly is of stainless steel construction. This option increases the overall height dimensions of the unit.

3.3 Devapormatic Exhaust System

This is a closed loop system which does not require a connection to building HVAC. The system includes a stainless steel blower, duct work attached to the washer and a cold water condenser to reduce excessive vapor and the cool air returning to the chamber.

3.4 Dryer c/w Devapormatic Exhaust System

This system does not require a connection to building HVAC. The system includes a stainless steel blower, duct work attached to the washer, a cold water condenser to reduce excessive vapor, and a steam coil which heats the air returning to the chamber.

3.5 Dryer c/w Vapor Removal Exhaust System

This system requires a connection to building HVAC. It includes a POV, stainless steel blower, duct work attached to the washer, and a steam coil which heats the air returning to the chamber.

3.6 Automatic Chemical Injection Pumps, Conductivity Based

A conductivity based, chemical injection system is provided to automatically inject user supplied chemicals into the unit's side tanks. The client may choose to have the conductivity system supplied and installed by their chemical vendor. The PLC control system will signal to the third



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party pumps when the machine is in a wash stage and chemicals are required.

3.7 Low Level Chemical Sensors

Low level chemical sensors are provided to signal washer when chemical supply stored in containers is almost empty. One to five low level chemical sensors can be added as required

3.8 Sample Port

A sample port can be added so that chemical concentration can be monitored during normal operation.

3.9 pH Neutralization for Effluent

Unit is provided with an integral effluent pH neutralization system to adjust effluent pH level within an acceptable range. System comes with a pH monitor located within the recirculation piping. During neutralization phase the washer will only proceed to drain if the monitor reading is within the adjustable range.

Note: pH probe may need to be replaced or re-calibrated as part of the preventative maintenance program.

3.10 Automatic Watering Rack Flushing System

A quick disconnect hose and fitting is provided to flush automatic watering type cage racks with fresh hot water during the rinse phase.

3.11 VHP or CD Capability

The unit is designed to accept fittings and connections for VHP or Chlorine Dioxide decontamination equipment. The user selects their own decontamination equipment; then appropriate fittings and connections are added by our factory technicians. All specifications for decontamination systems must be reviewed with our project managers prior to machine construction and design.

3.12 Acid Wash Solution Holding Tank

A third and separate acid wash solution holding tank is provided to deliver heated acid wash solution to the oscillating spray system. Piping and pump are common to both the alkaline and

acid wash stages. Wash solution can be automatically returned to the holding tank or neutralized prior to being directed to drain after each cycle.

The wash solution holding tank(s) has a minimum 80 gallon (300 liter) capacity and is heated by a stainless steel steam coil or an optional electric heating element. Each holding tank is equipped with an automatic digital temperature controller, automatic water fill, automatic water level control, automatic drain valve, and overflow piping. Solution temperature is monitored and displayed on the operator interface touchscreen.

3.13 Direct Facility Rinse

The washer is supplied with an in-line instantaneous steam heat exchanger to raise the temperature of the incoming hot water supply to the desired temperature. The system is capable of providing a minimum rinse temperature of 180°F.

Two heat exchanger models are available the first unit will raise incoming water temperature from 120°F to 180°F. The second unit will raise incoming water temperature from 60°F to 180°F. Both require 40gpm at 40-60psi pressure water supply.

This option can be used in lieu of the Rinse storage tank.

3.14 Shut-off Valves

Used to isolate steam and water supply line components for maintenance and repair purposes.

3.15 Pressure Gauges

Liquid filled gauges are conveniently installed for monitoring the supply pressure of steam, hot and cold water.



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3.16 Temperature Gauges

These gauges monitor hot water supply temperature as well as operational hot water temperature.

3.17 Water Arrestors

Help to prevent water hammering which may cause excessive strain on plumbing components.

4.0 CONTROL SYSTEM OPTIONS

4.1 Impact or Thermal Cycle Data Printer

An integral thermal or dot matrix printer with automatic paper take-up is provided to record all cycle program and in process performance data including data, times, treatment cycle selected, deviations, and alarms for permanent record.

4.2 Printer Cover

A NEMA12, IP54 rated plastic printer cover to house both the printer and automatic paper take-up spool. Cover allows for protection of both the printer and take-up spool.



Figure 19: Printer Cover

4.3 USB Color Printer Capability

The 8" touchscreen interface allows for printing directly to a specified printer using a USB cable.

4.4 RS485 Port for Data Transfer

An RS485 communication port is provided for the transfer of cycle data to a remote computer terminal or printer. [Software integration to interpret data by others]

4.5 Compact Flash Card - Data Collection

The unit can be provided with a 64MB compact flash card allowing Supervisors/Managers the ability to download current cycle data directly to the flash card and printing this cycle data offline with a PC or laptop station. Data is automatically stored with a date stamp on the file. Cycle data and parameters can be viewed and printed using MS-Excel software. The 64MB CF can store roughly 1-2 years of data.



Figure 20: Sample 64MB CF Card

4.6 Compact Flash Card – Program Backup

The unit can be provided with a 64MB compact flash card allowing Supervisors/Managers the ability to save current cycle programs from the PLC, and current touchscreen parameters from the touchscreen panel for storage and safe keeping in the event of a PLC or touchscreen failure.

4.7 Ethernet Connectivity to PLC

The unit is provided with the Remote Data Transfer System (BBRDTS) where the data files in the compact flash card can be transferred to a central PC via Ethernet and a windows FTP program. The PLC is connected to the facilities network via Ethernet and the supervisor is able to upload, download, and delete data files from each washer control system from their office PC. This option requires coordination between BetterBuilt Engineering and the Facility's IT Department. A main office PC (by others) and Ethernet connection port (by others) near the equipment is required.



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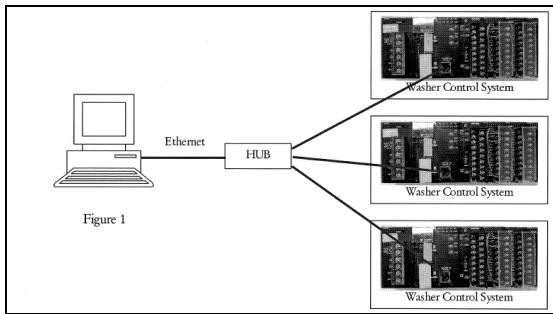


Figure 21: Ethernet /Hub Connection to Equipment PLC Diagram

4.8 Factory Ethernet Connectivity

The unit is provided with an Ethernet connection for remote online diagnostics, software upgrades, and troubleshooting. Factory based service personnel will be able to assist local service remotely identifying system malfunctions and recommendations for repair. This option requires coordination between BetterBuilt Engineering and the Facility's IT Department.

4.9 Touchscreen Ethernet Web Server

Connectivity *NEW!*

The unit is provided with an Ethernet connection to the touchscreen for remote online diagnostics, and troubleshooting. Any approved personnel without any additional software will be able to view the touchscreen parameters right from their PC (by others). The individual will be able to monitor, control, make changes or troubleshoot the operation of the unit. This option requires coordination between BetterBuilt Engineering and the Facility's IT Department.

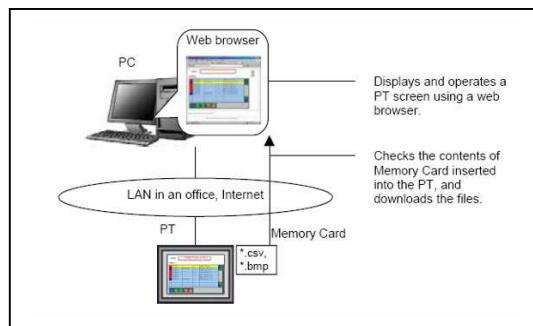


Figure 22: Ethernet /Hub Connection to Equipment Touchscreen Diagram

4.10 Modem

A modem is provided for remote online diagnostics, software upgrades, and troubleshooting. Factory based service personnel will be able to assist local service remotely identifying system malfunctions and recommendations for repair.

4.11 Surge Protection

This device will protect all 120VAC and 20VDC components from electrical transients.

4.12 Closed Circuit TV Camera [CCTV]

The unit can be provided with an integral CCTV Camera system allowing operators on the loading side of the washer to view the clean side wash room area. Up to 4 CCTV Cameras can be integrated into the touchscreen controls package.



Figure 23: CCTV Camera

4.13 Clean Side Buzzer

The buzzer is mounted on the exterior of the washer in the clean side room. It will sound for an adjustable time period at the beginning of a cycle. The buzzer can also be turned on or off for various alarm conditions.



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5.0 ACCESSORIES

BWC9 Bottle Washing Cart [# 209-50100]

A stainless steel, spray jet manifold cart is provided for processing of up to ten water bottle baskets, based on basket configuration. The Cart-Lock fitting connection allows operators to engage and disengage the floor mounted manifold connection without manual intervention. Cart requires the optional Automatic Manifold Connection.



Figure 24: BWC9 Bottle Washing Cart

UC6 Universal Cart [#206-50200]

The BetterBuilt cage and pan washing cart is designed to process common sizes of rodent cages and debris pans, holding them in position for thorough spray coverage. The Universal Cart holds 54 standard mouse cage⁽ⁱ⁾ bottoms or 36 standard rat cage⁽ⁱⁱ⁾ bottoms per load.



Figure 25: UC6 Universal Wash Cart

R-5-4 Universal Basket Rack [# 206-50207]

The five level R-5-4 Universal Basket Split Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 40 standard mouse cage⁽ⁱ⁾ bottoms or 10 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms or 30 OptiMice bottoms per load.



Figure 26: R-5-4 Universal Basket Split Rack

R-5-8 Universal Basket Rack [# 206-50208]

The five level R-5-8 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 80 standard mouse cage⁽ⁱ⁾ bottoms or 30 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load or 64 OptiMice bottoms per load.



Figure 27: R-5-8 Universal Basket Rack



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R-5-10 Universal Basket Rack
[# 206-50209]

The five level R-5-10 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 100 standard mouse cage⁽ⁱ⁾ bottoms or 40 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms or 90 OptiMice bottoms per load.



Figure 28: R-5-10 Universal Basket Rack

R-4-4 Universal Basket Rack
[# 206-50204]

The four level R-4-4 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 32 standard mouse cage⁽ⁱ⁾ bottoms or 14 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit also designed to handle 32 standard OptiMice cages or 16 OptiRat cages per rack.



Figure 29: R-4-4 Universal Basket Split Rack

R-4-8 Universal Basket Rack
[# 206-50205]

The four level R-4-8 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 64 standard mouse cage⁽ⁱ⁾ bottoms or 36 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit also designed to handle 50 standard OptiMice cages or 24 OptiRat cages per rack.



Figure 30: R-4-8 Universal Basket Rack

R-4-10 Universal Basket Rack
[# 206-50206]

The four level R-4-10 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 80 standard mouse cage⁽ⁱ⁾ bottoms or 44 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit also designed to handle 72 standard OptiMice cages or 32 OptiRat cages per rack.



Figure 31: R-4-10 Universal Basket Rack



R730 MODEL CAGE & RACK WASHER

**R-3-8 Universal Basket Rack
[# 206-50210]**

The three level R-3-8 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 48 standard mouse cage⁽ⁱ⁾ bottoms or 30 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit also designed to handle 42 standard OptiMice cages or 18 OptiRat/OptiRat Plus cages per rack.

**R-3-10 Universal Basket Rack
[# 206-50211]**

The three level R-3-10 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 60 standard mouse cage⁽ⁱ⁾ bottoms or 36 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit also designed to handle 54 standard OptiMice cages or 24 OptiRat/OptiRat Plus cages per rack.

LPR9 Large Processing Rack [# 209-50604]

The LPR9 Large Processing stainless steel rack is designed to accommodate 8 to 12 Guinea pig and Rabbit trays.

ITR9 Interior Tilt Ramp [# 209-50001]

The ITR9 Interior Tilt Ramp feature provides an incline within the washing chamber to facilitate draining of solid shelf type racks and/or racks where standing water potential exist.

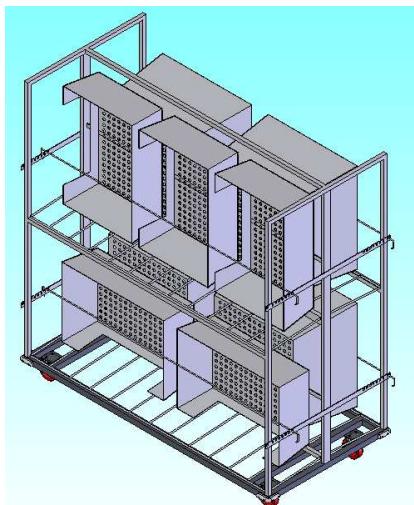


Figure 32: LPR9 Large Processing Rack



R730 MODEL CAGE & RACK WASHER

6.0 OPTIONS CHECK LIST

Configuration Options

Door(s)

- Single
- Two (pass-thru)
- Dual Enlarged Viewing Windows

Controls

- Left Side Services
- Right Side Services

Base Type

- Pit Mounted
- Floor Mounted

Installation

- Freestanding
- Recessed One Wall
- Recessed Two Walls
- Seismic Anchors

Spray Coverage

- Cart Lock for Accessories
- Automatic Tilt Floor

Equipment Options

Heating Type

- Steam Heating Coils [standard]

Exhaust / Ventilation

- POV collar with pneumatic vent damper for direct connection to HVAC [standard]
- Exhaust Vapor Removal Condenser
- Power Exhaust Stainless Steel Fan
- Devapormatic Exhaust System, closed loop
- Dryer c/w Devapormatic Exhaust System
- Dryer c/w Vapor Removal Exhaust System

Chemical /Detergent

- Pumps Supplied by Chemical Vendor
- Automatic Chemical Injection Pumps, Conductivity Based
 - One
 - Two

- Three

- Four

- Five

- Low Level Chemical Sensors

- One

- Two

- Three

- Four

- Five

- Chemical Sample Port

- pH Neutralizer Controlled by Microprocessor

VHP or CD Capabilities

- Provide Connections Only
- Complete System Supply

Solution Storage / Handling

- Acid Wash Solution Holding Tank
- Automatic Watering Rack Flushing System
- Direct Facility Rinse

Values / Gauges

- Steam and Water Shut-off Valves
- Steam and Water Pressure Gauges
- Hot Water Temperature Gauges
- Water Hammer Arrestors

Control System Options

Controls

- 8" Touchscreen & Guard [standard]

Documentation/Diagnostics

- Printer – Thermal
- Printer – Impact
- USB Color Printer with cable
- NEMA 12, IP54 Protective Cover
- RS485 Port for Remote Data Transfer
- Compact Flash Card – Data Collection
- Compact Flash Card – Program Backup
- Ethernet Connection to PLC
- Ethernet Connection to Factory
- Touchscreen Ethernet Web Server Connectivity
- Modem



**R730 MODEL
CAGE & RACK WASHER**

Safety

- Surge Protection
- CCTV - Clean Side
- Audible Buzzer - Clean Side

- LPR9 Large Processing Rack for Guinea pig and Rabbit trays [# 209-50604]
 - QTY _____

Accessories

- BWC9 Bottle Washing Cart [#209-50100]
 - QTY _____
- UC6 Universal Wash Cart for large cages and pans [#206-50200]
 - QTY _____
- R-5-4 Universal Basket Rack [# 206-50207]
 - QTY _____
- R-5-8 Universal Basket Rack [# 206-50208]
 - QTY _____
- R-5-10 Universal Basket Rack [# 206-50209]
 - QTY _____
- R-4-4 Universal Basket Rack [# 206-50204]
 - QTY _____
- R-4-8 Universal Basket Rack [# 206-50205]
 - QTY _____
- R-4-10 Universal Basket Rack [# 206-50206]
 - QTY _____
- R-3-8 Universal Basket Rack [# 206-50210]
 - QTY _____
- R-3-10 Universal Basket Rack [# 206-50211]
 - QTY _____

- ITR6 Interior Tilt Ramp - lift out [#206-50001]
 - QTY _____

Electrical Options

- 380VAC, 50 Hz, 3-Phase
- 380VAC, 60 Hz, 3-Phase
- 415VAC, 50Hz, 3-Phase
- 480VAC, 60 Hz, 3-Phase
- 575VAC, 60 Hz, 3-Phase

ⁱ Standard Mouse Cage Bottom size 7.25" W x 11.5" L x 5" D or [184mm x 292mm x 127mm]

ⁱⁱ Standard Rat Cage Bottom size 11" W x 17" L x 7.25" D or [279mm x 432mm x 184mm]

ⁱⁱⁱ Top row of Standard Rat Cages must be positioned horizontally for load clearance purposes.



NSC - BETTERBUILT FEATURE ADVANTAGES

BETTERBUILT R730 CAGE AND RACK WASHER

Northwestern System's BetterBuilt Products meet and/or exceeds specifications of Competitive products offering similar features. We offer the following value added features we feel exceed the specified product and offer the Client additional value for their facility and operations.

ENVIRONMENTAL & CONSERVATION FEATURES

VALUE ADDED FEATURE: Low Utilities Consumption

The BetterBuilt Model R730 high efficiency cage and rack washer consumes less water and steam than standard cage and rack washers. The use of heated side solution holding tanks coupled with recirculation and re-use of selected treatment solutions conserves considerable water, steam, and time. The BetterBuilt R730 has been programmed to reuse wash solution for subsequent cycles or send wash solution to drain. For the greatest savings in water consumption and chemical use, we recommend re-using wash solution for 5-10 cycles. As required, the operator will be able to set the washer into a drain mode, where the washer will automatically drain the storage tanks and flush the washer.

ERGONOMIC AND LONGEVITY FEATURES

VALUE ADDED FEATURE: Positive Seal Door with Inflatable Gasket

The R730 uses an inflatable gasket to completely seal the cabinet door(s). Each door has a pneumatic operated stainless steel lock to ensure the cabinet cannot be opened while in use. To maintain the soiled/clean barrier, only one door can be opened at any given time. For safety reasons the washer is equipped with two highly visible interior safety cables when pulled will cancel all wash processes, release the door lock and deflate the door gasket. Additionally, the inflatable gasket is completely secured around the periphery of the door unlike competitive systems which separate more easily.

VALUE ADDED FEATURE: Door Lock System

The R730 uses a stainless steel, flat stock, sliding door system on both the load and unload ends of the machine. The flat stock design is more robust and less prone to bending or warping than competitive pin style systems.

VALUE ADDED FEATURE: Noise Reduction

The BetterBuilt Model R730 high efficiency cage and rack washers are designed so as to minimize decibel ratings during operation. The unit's cabinet, chamber, and mechanical services are completed insulated keeping sound levels to reasonable decibel ratings in line with worker safety recommendations.

VALUE ADDED FEATURE: Front Side Filter Access

A self-cleaning filter has been positioned in the service closet space accessible from the front of the unit to remove all debris from the wash and rinse solutions. Perforated openings in the filter are 60 mesh which are smaller than the openings in the spray jet nozzles. Since the filter is self-cleaning, no daily or weekly cleaning is required. We recommend visual inspection at regular intervals.

PRODUCTION EFFICIENCY & EASE OF MAINTENANCE FEATURES

VALUE ADDED FEATURE: Dedicated Piping for Wash and Rinse Solutions

Both the wash and rinse solutions are circulated through the high-pressure spray nozzles in dedicated piping routes to reduce the risk of bacteria or detergent carry-over. Only stainless steel piping, pumps, flanges and spray jets are used, no plastic or rubber connectors to deteriorate under chemical exposure. The R730 is provided with an alkaline solution and rinse solution storage tank as standard equipment. An acid solution tank and spray system is available as an option.

VALUE ADDED FEATURE: Reduced Cycle Times

The BetterBuilt R730 high efficiency cage and rack washer holds wash solution and rinse solution in two heated, insulated storage tanks. As soon as a cycle is selected and the START button depressed, the washing process begins, no heat up time. Since current cage wash chemicals can be used at +180°F/82°C, the R730 can decontaminate cages during the chemical wash stage. A fresh hot water rinse follows to remove residual chemical and further enhance bacterial reduction. Typical cycle times range from 6-10 minutes for an alkaline wash cycle or 12-15 minutes for an acid cycle. Times can be reduced further if required per user preference.

VALUE ADDED FEATURE: Peristaltic Chemical Injection Pumps [Optional]

The BetterBuilt Model R730 cage and rack washer comes with optional Peristaltic type chemical injection pumps. Competitive systems employ diaphragm type pumps which require chemical drum locations within 10-20 feet of the point of use due to there design limitations. Most Chemical vendors prefer the use of Peristaltic type pumps because their design allows for chemical transport over greater distances alleviating the needs for day tanks associated with diaphragm pumping systems.

VALUE ADDED FEATURE: Aqua Pulse System

The BetterBuilt Model R730 standard cage and rack washer comes standard with the Aqua Pulse System for both the Washing and the Rinsing stage. The header system allows for customized cycles, exposure times, and spraying patterns. The Aqua Pulse System allows users the availability and flexibility to customize different spraying patterns promoting more wash/rinse exposures in the chamber from either the left or right side spray arms, thus allowing loads with heavier debris buildups on the right or light with more wash exposure unlike competitive models that only pulse the Washing stage.

VALUE ADDED FEATURE: Spraying Coverage

The BetterBuilt Model R730 standard cage and rack washer comes standard with 160 Stainless steel Wash Nozzles and 100 Stainless steel Rinse Nozzles. More nozzles provided than any other comparable washer. Also, some competitors use plastic nozzles that are not as durable.

VALUE ADDED FEATURE: Compact Flash Card – Programs Back Up [Optional]

Provided with the BetterBuilt R730 Cage and Rack washer is the 64MB Compact Flash Card option. The 64MB Compact Flash Card allows Supervisors to save both their customized PLC program to the card as well as the ability to store their customized Operator Interface screens from the machines touch screen interface on the same 64MB memory card. This option exceeds products providing only a download memory chip by allowing Managers the ability to save additional machine critical information from the touch screen interface.

VALUE ADDED FEATURE: “Green Initiatives” Paperless Data Logging [Optional]

The BetterBuilt Controls package provides the capabilities of a wide range of data logging features for client requirements of cycle documentation. Traditional thermal or matrix printers can be selected, or standard USB cable printing with PictBridge compatible printers can be used for direct printing of cycle data. More advanced and following our “Green Initiatives” Program, we offer printing abilities to integrated Compact Flash cards or with Ethernet Connectivity directly to local intranet based computers for easy file transfer. All E-Files can be accessed and viewed utilizing Microsoft Excel programs.

VALUE ADDED FEATURE: Solid State Microcomputer Control System

The BetterBuilt R730 Cage and Rack Washer comes standards with our Non-Proprietary OMRON based PLC Controls System. Our controls exceed the competitive systems by incorporating the highest level of diagnostic tools available in the marketplace today. Our controls system comes standard with integrated P&ID screens, real time, graphical Process Flow screens, and a series of color coded Input/Output Card screens for maintenance troubleshooting purposes. We provide an advanced alarm and data logging screen with detailed descriptions of fault as well as a list of possible causes on screen. Finally, we have incorporated a complete Part List ID and Visual Reference screens for verifying, troubleshooting, and identifying the machine's mechanical components on screen.

VALUE ADDED FEATURE: Active PM Feature

New to the BetterBuilt Controls package is our Statistic Mode logging screens providing cumulative cycle and mechanical component usage. Given operating life cycles of the various mechanical components of the equipment, Active PM Schedule set points can be programmed allowing proactive versus reactive machine maintenance.

VALUE ADDED FEATURE: Touch Screen Ethernet Connectivity

The BetterBuilt Control package is the first in the Industry to offer a low-cost remote troubleshooting solution for Supervisory and/or Maintenance Personnel via our Touch screen Ethernet Connectivity option. The feature saves valuable time, travel, and expenditures by allowing authorized personnel a preview of equipment status remotely in real-time.

VALUE ADDED FEATURE: Bottle Washing Capability

The BetterBuilt R730 Cage and Rack Washer comes standards with the ability to wash Bottle Baskets. With the use of the BWC-9 Bottle Washing Cart, the R730 is able to wash up to 10 standard size bottle baskets.

VALUE ADDED FEATURE: Non-Proprietary Components

The majority of our component parts are selected first for their ability to withstand high frequency use in a high humidity atmosphere and secondly to be non-proprietary for sourcing accessibility during the many years the washer will be in service. Many of our parts can be sourced from local suppliers in your area.

VALUE ADDED FEATURE: North American Components

All of our component parts are from readily available North American suppliers. Unlike other competitors, all of our parts can be sourced from local suppliers in your area.



R600 SERIES
CAGE & RACK
WASHERS

www.nsc-betterbuilt.com



R600 SERIES CAGE & RACK WASHERS

The BetterBuilt R600 Series Cage and Rack Washer is the result of modern technology combined with a proven spray design. This approach delivers the cleaning performance, ease of use and long-term durability demands of today's busy laboratories. Choose from four models to best suit your site conditions and washing requirements.

High Pressure Spray with Total Coverage

Wash and rinse solutions are distributed throughout the wash chamber by rotating spray arms positioned for complete coverage. Spray arms are driven by water pressure, no oscillating manifold is required.

Choice of Sizes and Door Configurations

The R600 series washers are available in single door and two door pass-thru models. The simplicity of our design allows us to fabricate custom sizes to match important length, width and/or height requirements.

Guaranteed Temperatures

Throughout the Cycle

Chemical suppliers have specific temperature recommendations for best performance from their detergents. Our micro-processor control system allows the user to preset the correct solution temperature for each step of the wash cycle and for guaranteed bacteria kill during the final stage.

Touchscreen Controls

The touchscreen controls allow the user to easily select from 8 pre-programmed cleaning cycles. The easy to read information screen shows the current operating cycle and stage, actual temperature and time remaining.

Micro-processor

Cycles and communication features are controlled by micro-processor. Each cycle can be preset for time, temperature, multiple washes, multiple rinses, chemical additives, exhaust and water saving for maximum efficiency. Programmed wash cycles are protected via pin number access, ensuring up to 11 levels of security. Pre-set temperatures for wash and rinse cycles are guaranteed and are verified with our alarm logging capabilities. Recording of wash cycle data is now available digitally with our optional compact flash card or with our Ethernet connectivity to PLC data retrieval option.





Solid Construction for Durability

All BetterBuilt washers are built with durability in mind. Cabinets and doors are all stainless steel construction, fully welded and polished to a satin finish. The complete solution circulation system including pumps, flanges, pipe connections and loading equipment is constructed of type 304 stainless steel for compatibility with all types of detergents. Type 316 stainless steel is available as an option. No plastic or rubber piping connections are used.

Maintenance and Replacement Parts

A preventative maintenance program is required for warranty purposes and is available from a local service agent. All BetterBuilt washers use microprocessor program controllers for long life and ease of service diagnostics. All components are non-proprietary and are available from local suppliers or the factory.

Noise Reduction

Component selection and design engineering have ensured that sound levels around the washer are kept below 80dB which are in line with current worker safety recommendations.

Alkaline and Acid Compatible

All BetterBuilt washers have a stainless steel cabinet and circulatory system, containing no plastic or rubber connections. This makes the washer compatible with all alkaline or acidic detergents and extends the operational life of the washer.

Safety Features

Personnel safety features include an emergency stop (e-stop) button located at both the soiled and clean ends of the washer. Inside the wash chamber, a highly visible emergency stop cable is located on one side or as an option on both sides. The washer door latch is designed to release easily when the door is pushed from the inside.

Optional Side Tanks

Reduced cycle times, energy savings and lower chemical consumption are benefits of using side tanks which include; drain surge tank, heated fill tank, heated rinse storage tank, and alkaline/acid storage tanks.



R600 SERIES CAGE & RACK WASHERS

APPLICATION

The BetterBuilt R600 Series Washers are automatic, heavy duty, multi-cycle, single chamber, floor loading, hydro-spray washers using an overlapping, rotary spray arm system for complete coverage.

Note: Custom sized cabinets are available, contact BetterBuilt or your local representative for further details. Due to continued engineering improvements, specifications are subject to change without notice.

INTERIOR CHAMBER

MODEL	W x H x L
R620	42 x 84 x 80"
	1067 x 2134 x 2032mm
R630	48 x 88 x 90"
	1219 x 2235 x 2286mm
R670	48 x 88 x 130"
	1219 x 2235 x 3302mm
R690	48 x 88 x 180"
	1219 x 2235 x 4572mm

EXTERIOR CABINET

W x H x L
80 1/2 x 103 x 84"
2045 x 2616 x 2134mm
87 1/2 x 107 x 94"
2223 x 2718 x 2388mm
87 1/2 x 107 x 134"
2223 x 2718 x 3404mm
87 1/2 x 107 x 184"
2223 x 2718 x 4674mm

STANDARD FEATURES

- Pit Mounted
- All Stainless Steel Construction
- Insulated Double Wall Cabinet and Door(s)
- Manual Swing-out Hinged Door(s)
- Stainless Steel Threshold Plate at Door(s)
- Spring Loaded Safety Door Latch
- Stainless Steel Floor Grating in Lift-up Sections
- Stainless Steel Pump and Circulatory Piping
- Overlapping Rotary Spray System
- Adjustable Spray Patterns
- Temperature Guarantee During All Cycle Phases
- Water Conservation System
- Drain Discharge Cool Down
- Fully Drained and Flushed Sump
- Automatic Sump Level Control

- Pneumatic Operated Exhaust Damper
- Double Level Debris Screens in Wash Chamber
- 5 Chemical Injection Ports, Contacts and Fittings
- Interior Side Bumper Rails
- Interior Emergency Stop Cable
- Illuminated Chamber Interior
- Emergency Stop Button at Door(s)
- Automatic Multi Phase Treatment Cycles
- 8 Fully Adjustable Programmed Cycles
- Multi-cycle Microprocessor Control System
- 5" TFT Color Touchscreen Control Panel
- Program Security via Pin Number Access
- Built-in Advanced Diagnostics
- Non-proprietary Components

OPTIONAL FEATURES

- Single Door or Two Door Pass Thru
- Left or Right Side Service Access
- Dual Enlarged Viewing Windows
- Low Profile 6" Base
- Barrier Wall Trim to Close Wall Openings
- Interior Door Bumpers
- Seismic Anchors
- Automatic Cart Lock Connection
- Automatic Tilt Floor
- Horizontal Oscillating Spray Jet System
- Lateral Travelling Spray Jet System
- Facility Direct Rinse
- Pump Direct Rinse
- Integrated Pan Washing System
- Water Supply Temperature Steam Booster (60°F to 180°F)
- Water Supply Temperature Steam Booster (120°F to 180°F)
- Stainless Steel Steam Coil Sump Heating
- Electric Element Sump Heating (R620 and R630 Only)
- Automatic Watering Rack Flushing System
- Exhaust Vapour Removal Condenser
- Exhaust Stainless Steel Blower
- Devapormatic Exhaust System, Closed Loop
- Dryer System c/w POV
- Dryer c/w Devapormatic System
- Automatic Chemical Injection Pumps, Time Based
- Low Level Chemical Sensor
- Sampling Port
- pH Neutralization for Effluent
- Drain Surge Tank

- Heated Fill Tank
- Heated Rinse Storage Tank
- Alkaline and Acid Solution Re-use Tanks
- Cold Water Fill System
- Chilled Water Drain Cool Down
- External Self Cleaning Debris Filter
- Dedicated Low Volume Drain Pump
- VHP/iHP/CD Capability
- Pneumatic Door Gasket
- Shut-off Valves, Pressure Gauges, Water Arrestors
- 8" TFT Color Touchscreen Control Panel
- Stainless Steel Control Guard
- Thermal Cycle Data Printer
- Printer Cover
- RS485 Port for Remote Data Transfer
- Compact Flash Card for Data Collection
- PLC and Touchscreen Program Backup
- Ethernet Connectivity to PLC for Data Transfer
- Factory Ethernet Connectivity for Online Diagnostics
- Touchscreen Ethernet Connectivity for Online Diagnostics
- Modem Connectivity for Factory Diagnostics
- Surge Protection
- NEMA Control Box
- CCTV Capabilities for Unload Side Camera
- Clean Side Buzzer
- Interior Emergency Stop Cable, Both Sides
- Activ™ Monitoring
- Activ™ View Integration

ACCESSORIES

See Accessories Brochure

DIVISION OF NORTHWESTERN SYSTEMS CORP

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Quotation: P5510(2)

24-Aug-20

R630 (2)

0

To: Dr. Saeed M. Al Sadek

Project:

Mobark Saeed Oun Trade Est.

King Saudi University Animal House

Madinah Road Tower Buliding Sec.Floor Office No:

Jeddah, Saudi Arabia

Cage and Rack Washer Model R630 (#706-00001)

Interior Cabinet Size: 48" wide x 88" high x 90" long

Standard Features

- Pit Mounted
- All Stainless Steel Construction
- Insulated Double Wall Cabinet and Door(s)
- Manual Swing-out Hinged Door(s)
- Stainless Steel Threshold Plate at Each Door(s)
- Spring Loaded Safety Door Latch
- Stainless Steel Floor Grating in Lift-up Sections
- Stainless Steel Pump and Circulatory Piping
- Overlapping Rotary Spray System
- Adjustable Spray Patterns
- Temperature Guarantee During All Cycle Phases
- Water Conservation System
- Drain Discharge Cool Down
- Fully Drained and Flushed Solution Sump
- Automatic Sump Level Control
- Enlarged Viewing Window
- Pneumatic Operated Exhaust Damper
- External Self Cleaning Debris Filter
- 5 Chemical Injection Ports, Contacts and Fittings
- Interior Side Bumper Rails
- Interior Emergency Stop Cable
- Illuminated Chamber Interior
- Emergency Stop Button at Door(s)
- Automatic Multi-phase Treatment Cycles
- 8 Fully Adjustable Programmed Cycles
- Multi-cycle Microprocessor Control System
- 5" TFT Color Touchscreen Control Panel
- Program Security via Pin Number Access
- Built-in Advanced Diagnostics
- Non-proprietary Components

QTY:

1

Base Price, Includes All Standard Features 706-00001

Options Added to Base Price are Listed Below

EQUIPMENT CONFIGURATION

Cabinet:

Two Door Pass-Thru / Trim around Door Fascia on Two Doors

Interlocking Doors

Spray System:

Cartlock Manifold Connection

Traveling Manifold

Traveling Manifold - Direct Facility Final Rinse

EQUIPMENT OPTIONS

Heating:

Steam Heat Exchanger 120F - 180F (49C - 82C)

Steam Sump HX

Filtration:



Quotation: P5510(2)

24-Aug-20

R630 (2)

0

To: Dr. Saeed M. Al Sadek

Project:

Mobark Saeed Oun Trade Est.

King Saudi University Animal House

Madinah Road Tower Buliding Sec.Floor Office No:

Jeddah, Saudi Arabia

Cage and Rack Washer Model R630 (#706-00001)

Internal filter screen(s)	
External filter screen	
Exhaust / Ventilation:	
POV Collar with Pneumatic Vent Damper for Direct Connection to HVAC	
Storage System:	
One Chemical Non-Heated Storage Tank	
Heated Fill Tank	
Chemical / Detergent:	
Three Peristaltic Chemical Pump	
Signal Only to Start Pumps Supplied by Chemical Vendor	
CONTROL SYSTEM CONFIGURATION	
Control:	
Interior Emergency Stop Cable - Both sides	
Misc.:	
Service Side:	
	Equipment Total \$163,427.00
	Knock Down Ready for Shipment \$3,107.00
(One BetterBuilt Personnel Installation Supervision Assistance - 3 day(s)	Install \$11,408.00
(Flight, accommodations, expenses not included)	FAT \$2,300.00
(One BetterBuilt Personnel Startup Assistance - 2 day(s) only)	Startup \$10,534.00
	Total \$190,776.00
Accessories and Loading Equipment : add as required	QTY
BWC6 Bottle Washing Cart with Rotary Spray #206-50104	2 \$11,390.00
R-4-10 Universal Basket Rack for cages, accessories #206-50206	3 \$16,567.00
	Accessories Sub-total \$27,957.00
	Total Investment \$218,733.00



R600 SERIES CAGE & RACK WASHERS

PRODUCT DESCRIPTION

The BetterBuilt R600 Series cage and rack washer is the result of modern technology combined with a proven spray design. The R600 Series washers are automatic, heavy duty, single chamber, floor loading, hydro-spray washers. Both single and double door pass through units are available. Units may be floor or pit mounted through one or two walls or installed free standing.

APPLICATION

To clean and sanitize cages, utensils, racks, and bottles used in the care and housing of research animals.

STANDARDS¹

- Certified to UL 61010-1 Ed:2 UL Standard for Safety Electrical Equipment For Measurement, Control, and Laboratory Use by a third party inspection agency - ETL.
- Certified to CSA C22.2 No. 61010-1 Ed:2 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use by a third party inspection agency - ETL.
- Evaluated and conforms to IEC 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use by a third party inspection agency - ETL.
- Evaluated and conforms to CENELEC EN 61000-6-4 Electromagnetic Compatibility (EMC) – Part 6-4 Generic Standards – by a third party inspection agency - ETL.
- Evaluated and conforms to CENELEC EN 61000-6-2 Electromagnetic Compatibility (EMC) – Part 6-2 Generic Standards – by a third party inspection agency - ETL.
- Evaluated and conforms to IC ICES-003 & FCC CFR47 Part 15/B Report Measurements by a third party inspection agency - ETL.



CHOICE OF MODELS

Model	Chamber W x H x L	Overall W x H x L	Pit W x L x D
R620	42 x 84 x 80" 1067x2134x2032 mm	80.5 x 103 x 84" 2045x2616x2134 mm	87 x 84 x 14.5" 2209x2133x368 mm
R630	48 x 88 x 90" 1219x2235x2286 mm	86 x 114 x 94" 2184x2896x2388 mm	93 x 94 x 14.5" 2362x2387x368 mm
R670	48 x 88 x 130" 1219x2235x3302 mm	89 x 119 x 134" 2261x3023x3404 mm	106 x 134 x 19" 2692x3403x483 mm
R690	48 x 88 x 180" 1219x2235x4572 mm	89 x 119 x 184" 2261x3023x4674 mm	106 x 184 x 19" 2692x4673x483 mm

1.0 STANDARD FEATURES

1.1 Pit Mounted

The standard unit configuration is to be pit mounted flush to the facility's floor.

1.2 Construction - Cabinet

The wash chamber and sump pan including all wetted surfaces are of type 304 stainless steel.

Exterior chamber shall be of double wall construction, insulated with non-hygrosopic

¹ Steam units only



R600 SERIES CAGE & RACK WASHERS

rigid insulation, minimum of 1-1/2 inch thick. Panel sections are bolted together along the exterior using type 304 stainless steel fasteners.

1.3 Smooth Sided Chamber Interior

The wash chamber is designed with smooth side wall construction to reduce ledges or corners where gross debris may accumulate. All interior and exterior joints are sealed to prevent leakage from the chamber.

1.4 Manual Swing-out, Hinged Doors

The unit is provided with manually operated, swing out, side hinged, cabinet type door(s) having pressure relief safety latches. A stainless steel threshold plate is provided at each door.

1.5 Construction - Doors

The chamber door(s) shall be of 16 gauge, type 304, #4 finish stainless steel double wall reinforced construction. Each door is provided with one tempered glass window. All doors are insulated with non-hygroscopic rigid insulation, minimum of 1-1/2" inch thick.

1.6 Stainless Steel Chamber Floor Grating

The wash chamber floor is provided with reinforced stainless steel grating to support loaded carts and racks.

1.7 Stainless Steel Pump and Circulatory Piping

The treatment solutions are re-circulated under pressure from a minimum 10 HP (7.5HP on R620 and 20HP for R670/R690) pump with mechanical seal. All wetted surfaces of the pump shall be Type 316L stainless steel and all piping shall be Type 304 stainless steel. The pump motor is totally closed, fan cooled (TEFC) with starter, overload protection, and sealed bearings requiring no lubrication.

1.8 Overlapping Rotary Spray System

The wash/rinse chamber is provided with a stainless steel rotary spinner spray/arm system.

Spraying arms are designed and located to maximize spray coverage with an overlapping pattern of wares and spray down of the cabinet interior and to wash the underside of racks.

The spray system includes four (4) rotating and overlapping arms per side, two (2) rotating arms on the ceiling, and one (1) rotating arm below the floor grating (excluded on the low profile models). A total of eleven (11) rotating spray arms are provided for the standard R620/R630 models. Up to a total of twenty-two (22) rotating spray arms are provided for the R670/R690 models.



Figure 1: Interior of R630

All piping, screens, and other components of the spray system are constructed of Type 304 stainless steel (except wear parts which shall be constructed of Delrin material).

A three piece Delrin/Teflon bushing assembly protects the spray arm hub and axle from wear.

Spray arms are removable for cleaning. Terminal ends of the spray arms have a removable Teflon cap for spray nozzle cleaning and maintenance.



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1.9 Adjustable Spray Patterns

For facilities where soiled loads can be more heavily concentrated on one particular side of the load, each program can be customized to take advantage of the washer's capability for custom spraying patterns. Spray emphasis from either side of the wash chamber is adjustable for duration and modulation frequency from side to side.

1.10 Treatment Temperature Guarantee

The selected wash and/or rinse treatment periods will not begin timing until the re-circulated wash and/or rinse treatment solution temperature reaches the desired set point assuring a minimum temperature during the treatment period.

Each treatment period can be guaranteed for temperature and time with set points locked in by supervision to insure security.

1.11 Water Conservation System

The operator has the option to either save the final rinse water for the subsequent pre-wash phase of the following cycle or automatically discharge the solution to drain at the end of the cycle.

1.12 Drain Discharge Cool Down System

Cold water is automatically injected into the drain discharge to lower the discharge temperature to below 140°F while discharging to the building drain system.

1.13 Full Drained and Flushed Solution Sump

Following the completion of treatment phases the chamber sump is gravity drained or can be power drained based upon site conditions. The drain line is left open for approximately 3-8 seconds (programmable, factory set to 8 seconds) to allow for a sump flush to drain, eliminating debris and residue carryover.

1.14 Automatic Sump Level Control

The washer is provided with automatic level control for re-circulation sump to insure sump is filled to the proper level before the pump starts. Design prevents over-filling and is included with an overflow to the drain.

1.15 Stainless Steel Automatic Damper

The washer chamber is provided with a stainless steel exhaust vent damper with pneumatic actuator in the exhaust line. An electrical signal to the facility's HVAC system is provided.

1.16 Chemical Injection Ports, Contacts, Fittings

The chamber is provided with five (5) injection ports and electrical signals for optional or owner supplied detergent dispensing and chemical treatment pumps. All penetrations to the washer chamber or staging tanks for detergent, acids or neutralizers are constructed using a stainless steel spigot welded at an angle to the unit's chamber.



Figure 2: Chemical Injection Ports

1.17 Interior Bumper Rails

The washer chamber is provided with internal rub bars/guards to protect the rotary spray arms from damage when the washer is loaded and unloaded.



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1.18 Interior Emergency Stop Cable

For operator safety one emergency stop cable is mounted inside the washer and runs the length of the chamber.

1.19 Illuminated Chamber Interior

The interior of the chamber shall be illuminated by exterior mounted compact fluorescent light fixture. Illumination is through a sealed tempered glass window to the interior space.

1.20 Emergency Stop Button

One emergency stop button is located at the control panel found next to each door.

1.21 Safety Features

Each machine is provided with the following safety features:

- Explosion relief door latches are provided for hinged doors so a person can easily egress from the chamber.
- In the event that either door is opened during the cycle the unit will automatically shut down. The door must be closed before restart can be initiated.
- The chamber interior is provided with a pull cable system mounted along one side of the interior cabinet (optional both sides). The cable is a plastic coated stainless steel braided cable installed inside the full length of the chamber enabling the washer to be immediately stopped from the interior by pulling the cable mechanism. An audible alarm will annunciate upon activation of interior shut down system. The cable pull switch must be reset and cycle power to the washer before restarting.
- Cycle start commands cannot occur unless both doors are fully closed.
- Both load and unload ends of the machine have emergency stop buttons.

1.22 Automatic Multi-Phase Treatment Cycles

The standard treatment cycle consists of the following phases: Pre-Wash, up to 4 Wash

phases, up to 3 Rinse phases, Final Rinse, and Exhaust/Dry. All cycle phases can be selected or de-selected with Supervisory access. All cycle phases are adjustable. The cycle once activated is completely automatic. A typical alkaline cycle is as follows:

- **Pre Wash**
Gross soils and debris are removed using either water retained from the final rinse or fresh domestic host water (120°F). Water is re-circulated for a preset time period (0000 to 9999 seconds) and then drained.
- **Alkaline Wash**
Hot detergent solution, water retained from the final rinse or fresh domestic hot water controlled at 120° to 160°F, and the preset amount of liquid chemical detergent, the solution is re-circulated for a preset period (0000 to 9999 seconds) and then drained.
- **First Rinse**
Fresh domestic hot water controlled at 120° to 190°F is sprayed over the load from the sump and re-circulated for an operator selected time period (0000 to 9999 seconds) and then drained. Once temperature of re-circulating water reaches selected temperature, the timer is engaged and rinse continues until the time expires.
- **Final Rinse**
Fresh water is sprayed over the load and re-circulated for a pre-selected time period (0000 to 9999 seconds). Water temperature is adjustable from 60° to 190°F. Final rinse water can either be retained for pre-wash or pumped to drain.
- **Exhaust**
Vapor exhaust phase removes hot humid air from the unit's chamber. Selectable time is between 0000 to 9999 seconds.

1.23 Multi-cycle Microprocessor Control System

A microcomputer with 5" touchscreen interface monitors and controls all aspects of the washer cycles and process operations. Standard eight (8) fully adjustable programmed cycles come with the unit. The PLC comes with battery



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backup of the microcomputer memory in the event of a power failure.

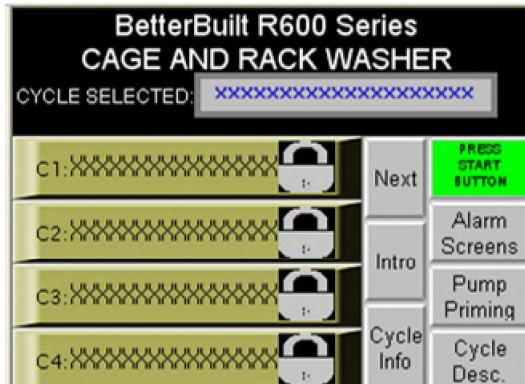


Figure 3: 5" Touch Screen Interface

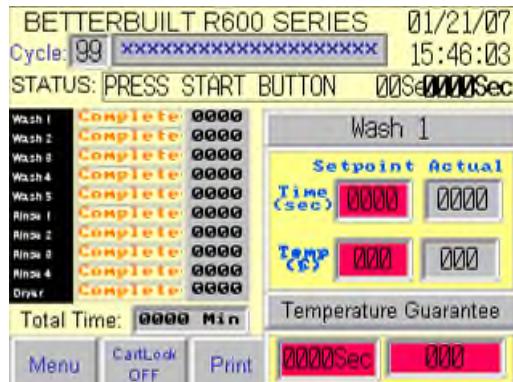


Figure 4: Cycle In-Process Screen

1.24 Multi-Language Support **NEW!**

The Touchscreen is able to display in multiple languages. The languages to be supported are English, French, Chinese, Korean, and Spanish. If there are other languages desired, please contact BetterBuilt Sales Department.

1.25 Program Security

The controls come standard with the "Advanced Adjustable Multi-Tiered Password Protection System". Cycle programming is set by supervisory personnel to insure process and cycle security. Treatment times, temperature settings, and other key cycle parameters are programmable. A tiered password system is available for incremental access to the various

program parameters. As the operator comfort and confidence level increases, supervisory personnel can grant increased security access to specific program parameters.

	Time/ Temp	Cycle Type	Cycle Data	Adj/ Cal	Re.ID	Pass	CYCLE DATA MOD
Password 1	NO	NO	NO	NO	NO	0000	
Password 2	NO	NO	NO	NO	NO	0000	
Password 3	NO	NO	NO	NO	NO	0000	
Password 4	NO	NO	NO	NO	NO	0000	
Password 5	NO	NO	NO	NO	NO	0000	
Password 6	NO	NO	NO	NO	NO	0000	
Password 7	NO	NO	NO	NO	NO	0000	
Password 8	NO	NO	NO	NO	NO	0000	
Password 9	NO	NO	NO	NO	NO	0000	
Password 1	NO	NO	NO	NO	NO	0000	
MASTER	NO	NO	NO	NO	NO	0000	

Figure 5: PROGRAM SECURITY: Supervisor Tiered Password Screen

1.26 Built-in Advanced Diagnostics

The controls feature several advanced diagnostics features beyond competitive systems to include:

- Advanced Alarm and Data Logging
- Advanced Diagnostics
- Advanced Maintenance and Troubleshooting
- Parts List ID and Visual Reference
- Technician Mode Coordinated I/O Charts
- Chemical Pump Priming function

1.27 Advanced Alarm and Data Logging

This program feature provides user friendly alarm log, recovery, and checking screens. Additionally, an alarm popup box with description and possible causes for the fault are integrated into the touchscreens.



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Figure 6: ADVANCED ALARM AND DATA LOGGING: Alarm Log and Recovery Screen

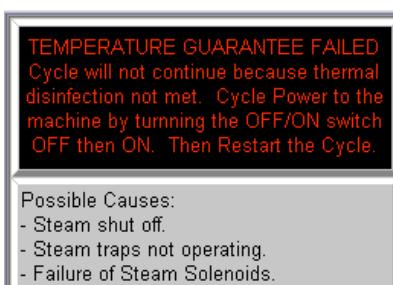


Figure 7: ADVANCED ALARM AND DATA LOGGING:
Alarm Message Help Screen

1.28 Advanced Diagnostics

The control program is provided with a graphical P&ID flow chart with real-time integrated service flow and Input/Output Summary screen allowing operators and service personnel quick access to machine function status.

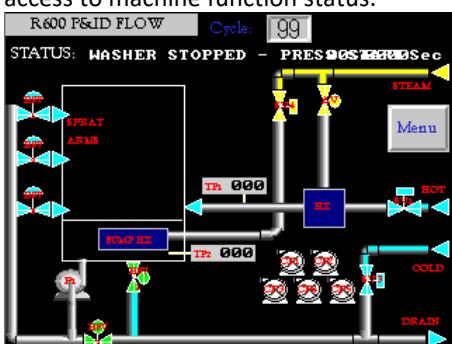


Figure 8: ADVANCE DIAGNOSTICS - P&ID Chart with Real-time Integrated Service Flow

1.29 Advanced Maintenance & Troubleshooting

The control program is also provided with an integrated P&ID chart screen with touch cell descriptions and an image based Service View.

screen with touch cell descriptions, providing operators and maintenance personnel a quick visual reference to parts and their descriptive information.

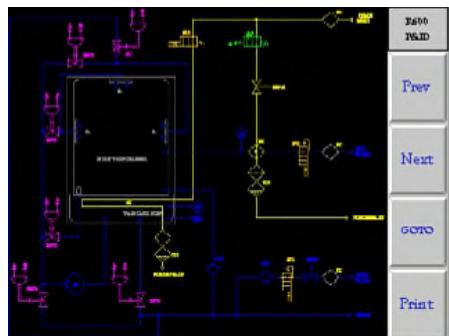


Figure 9: ADVANCED MAINTENANCE & TROUBLESHOOTING: P&ID Chart Screen

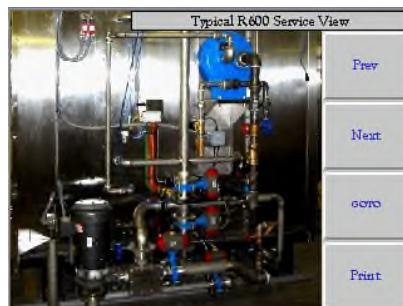


Figure 10: ADVANCED MAINTENANCE & TROUBLESHOOTING: Services View screen

1.30 Parts List ID and Visual Reference

The control program is provided with a Parts List Identification screen complete with pop up visual reference, symbols, and part #ID to assist operators and maintenance personnel with troubleshooting activities.

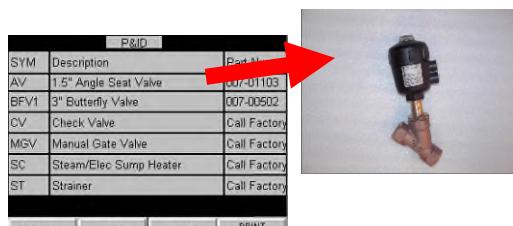


Figure 11 : PARTS LIST ID & VISUAL REFERENCE: Parts List ID Screen



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1.31 Technician Mode Coordinated I/O Charts

In the Service/Technician Mode, Technicians are provided the access to coordinated, color coded descriptive information, I/O status, wire number designations, I/O module color for each of the inputs and outputs of the system.

TECHNICIAN MODE		TECHNICIAN MODE		TECHNICIAN MODE	
I/O CARD INPUT CARD (16-23)		I/O CARD OUTPUT CARD (22-39)		I/O CARD	
Main Water Inlet Valve [AV5]	OP	MAIN WATER INLET VALVE	OP	Main Water Inlet Valve [AV5]	OP
Start Pump Button [Selchill Selco]	OP	Start Pump Button [Selchill Selco]	OP	Start Pump Button [Selchill Selco]	OP
Stop Pump Button	OP	Stop Pump Button	OP	Stop Pump Button	OP
Water Inlet Valve [Selco]	OP	Water Inlet Valve [Selco]	OP	Water Inlet Valve [Selco]	OP
Door Switch - Clean Side Closed [D1]	OP	Door Switch - Clean Side Closed [D1]	OP	Door Switch - Clean Side Closed [D1]	OP
Door Switch - Clean Side Open	OP	Door Switch - Clean Side Open	OP	Door Switch - Clean Side Open	OP
Start Pump Button [Selchill Selco]	OP	Start Pump Button [Selchill Selco]	OP	Start Pump Button [Selchill Selco]	OP
Stop Pump Button [Selchill Selco]	OP	Stop Pump Button [Selchill Selco]	OP	Stop Pump Button [Selchill Selco]	OP
Water Inlet Valve [Selco]	OP	Water Inlet Valve [Selco]	OP	Water Inlet Valve [Selco]	OP
PREVIOUS	NEXT	GOTO	PRINT SCREEN	PREVIOUS	NEXT

TECHNICIAN MODE		TECHNICIAN MODE		TECHNICIAN MODE	
I/O CARD INPUT CARD (16-23)		I/O CARD OUTPUT CARD (22-39)		I/O CARD	
MAIN WATER INLET VALVE	OP	MAIN WATER INLET VALVE	OP	Main Water Inlet Valve [AV5]	OP
Start Pump Button [Selchill Selco]	OP	Start Pump Button [Selchill Selco]	OP	Start Pump Button [Selchill Selco]	OP
Stop Pump Button	OP	Stop Pump Button	OP	Stop Pump Button	OP
Water Inlet Valve [Selco]	OP	Water Inlet Valve [Selco]	OP	Water Inlet Valve [Selco]	OP
Door Switch - Clean Side Closed [D1]	OP	Door Switch - Clean Side Closed [D1]	OP	Door Switch - Clean Side Closed [D1]	OP
Door Switch - Clean Side Open	OP	Door Switch - Clean Side Open	OP	Door Switch - Clean Side Open	OP
Start Pump Button [Selchill Selco]	OP	Start Pump Button [Selchill Selco]	OP	Start Pump Button [Selchill Selco]	OP
Stop Pump Button [Selchill Selco]	OP	Stop Pump Button [Selchill Selco]	OP	Stop Pump Button [Selchill Selco]	OP
Water Inlet Valve [Selco]	OP	Water Inlet Valve [Selco]	OP	Water Inlet Valve [Selco]	OP
PREVIOUS	NEXT	GOTO	PRINT SCREEN	PREVIOUS	NEXT

Figure 12: TECHNICIAN MODE I/O CHART

1.32 Statistics Mode and ActivPM *NEW!*

The control system is provided with a statistics mode that keeps track of a wide variety of parameters. Parameters such as per Cycle Usage, Total number of Cycles Operated, Hours of Operations, and much more.

GENERAL STATISTICS			
Cycles	OP	PM Sch	
Cycle 1	0000000	0000000	Reset
Cycle 2	0000000	0000000	Reset
Cycle 3	0000000	0000000	Reset
Cycle 4	0000000	0000000	Reset
Cycle 5	0000000	0000000	Reset
Cycle 6	0000000	0000000	Reset
Cycle 7	0000000	0000000	Reset
Cycle 8	0000000	0000000	Reset
PREVIOUS	NEXT	GOTO	PRINT SCREEN

Figure 13: General Statistics Screen

In addition to the recording of general statistics, this mode can be used to forecast a PM (Preventative Maintenance) Schedule, referred to as ActivPM. Each component is actively monitored for usage so that scheduled Preventative Maintenance programs will be more proactive. The control system will alert the maintenance personnel through a data log when each individual component has reached its anticipated life expectancy.

STATISTICS		
24VDC OUTPUT CARD (16-23)	OP	PM Sch
Main Water Inlet Valve [AV5]	0000000	0000000
HX Steam Inlet Valve [AV1]	0000000	0000000
Final Spray Valve [AV6]	0000000	0000000
Dryer Steam Coil Valve [AV2]	0000000	0000000
Rinse Inlet Water Valve [AV7]	0000000	0000000
Rinse Steam Stump Coil Valve [AV3]	0000000	0000000
Rinse Gravity Drain Valve [BFV]	0000000	0000000
Wash Inlet Water Valve [AV8]	0000000	0000000
PREVIOUS	NEXT	GOTO
PREVIOUS	NEXT	PRINT SCREEN

Figure 14: Activ PM Screen

1.33 Chemical Pump Priming Function

The control program is provide with a Chemical Pump Priming screen to allow supervisory and chemical agent personnel the ability to pre-program an adjustable time for chemical pump priming during chemical drum change out procedures. Feature insures that chemical lines are primed with chemical prior to washer operations during the cycle process.

CHEMICAL PRIMING					
CHEMICAL PUMP 1:	OFF	00	00		
CHEMICAL PUMP 2:	OFF	00	00		
CHEMICAL PUMP 3:	OFF	00	00		
CHEMICAL PUMP 4:	OFF	00	00		
CHEMICAL PUMP 5:	OFF	00	00		
	START	SCREEN			

Figure 15: CHEMICAL PUMP PRIMING FUNCTION: Chemical Priming Screen

1.34 Non-proprietary Components

All components are non-proprietary and are available from local suppliers or from the factory.



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2.0 CONFIGURATION OPTIONS

2.1 Single or Two Door Pass-Thru

The washer is available in a single door configuration or as a two door pass-thru. The unload end is provided with an operator status interface.

2.2 Left or Right Side Service Access

The unit comes standard with a choice of either left or right side service access.

2.3 Dual Enlarged Viewing Windows *NEW!*

The standard viewing window located in our door is replaced with dual enlarged viewing windows 20" W x 26" H which provide extra visibility into the chamber.

2.4 Low Profile 6" Base

The standard base design is for pit mounting. The washer can be provided with a low profile, 6" high base to accommodate facilities with shallow sump requirements or for floor mounting the unit.

2.5 Barrier Wall Trim to Close Wall Opening

Stainless steel trim strips and flanges are provided for recessed wall openings or at barrier wall enclosures.

2.6 Interior Door Bumper

Horizontally mounted, non-abrasive bumper protects the interior door surface from potential impact by carts during loading and unloading of the washer.

2.7 Seismic Anchoring

Washer is provided with seismic anchoring brackets designed in accordance with local seismic codes.

2.8 Automatic Manifold Connection to Accessories

The washer is provided with a floor mounted, manifold coupling system to divert wash/rinse solution through accessory carts. The coupling connection is automatic to the accessory cart when the cart is positioned into the washer. The manifold flange connection is made without manual fastening by the operator.

2.9 Door Interlocks

During loading and unloading of the washer the door interlock provides a secure barrier from potential cross contamination by not allowing pass-thru access from the soiled side to the clean side of the washer.

2.10 Automatic Tilt Floor

For loads with horizontal surfaces which pool water, the automatic tilt floor will elevate on one side thus allowing horizontal surfaces to drain.

2.11 Horizontal Oscillating Spray Jet System

In lieu of the standard overlapping rotary spray arms, the unit is provided with a 110° horizontal oscillating spray jet system driven by pneumatically operated rod less cylinders.



Figure 16: Horizontal Oscillating Spray Jet System

2.12 Lateral Travelling Spray Jet System

In lieu of the standard overlapping rotary spray arms, the unit is provided with a lateral travelling carriage equipped with spray jet nozzles mounted above, below and on each side of the manifold. The system is driven by a



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pneumatic cylinder and cable system operating in conjunction with the treatment schedule.

2.13 Facility Direct Rinse

The traveling manifold spray jet system is provided with a separate non-recirculated rinse header and controls to allow the user to select either a non-recirculated rinse, recirculated rinse, or both.

2.14 Pump Direct Rinse

The traveling manifold spray jet system is provided with a separate non-recirculated rinse header, storage tank, pump and controls to allow the user to select either a non-recirculated rinse, recirculated rinse, or both.

2.15 Integrated Pan Washing

The traveling manifold spray jet system is provided with a side mounted integrated pan washing option. Dedicated spray jet nozzles provide coverage for pans while simultaneously processing cages and racks.

3.0 EQUIPMENT OPTIONS

3.1 Water Supply Temperature Booster

The washer is supplied with an in-line instantaneous steam heat exchanger to raise the temperature of the incoming hot water supply to the desired temperature. The standard unit will raise incoming water temperature from 120°F to 180°F. The optional unit will raise incoming water temperature from 60°F to 180°F.

3.2 Stainless Steel Steam Coil Heating

The wash chamber sump is provided with a steam heated, stainless steel, and tubular sump coil to maintain solution temperature as it re-circulates within the wash chamber.

Both the heat exchanger and sump heating coil are sized adequately to operate with a maximum incoming steam pressure of 60 psig.

The steam coil is designed to ASME Section VIII, Div. 1, Unfired Pressurized Vessel Code.

A bucket trap is provided for the steam water supply temperature booster. A thermostatic steam trap is provided for the steam sump coil.

3.3 Electric Element Sump Heating

The washer is supplied with electric sump heaters, 40Kw total. Incoming hot water supply temperature must be consistent at 185°F for a minimum final rinse temperature of 180°F. (Model R620 and R630 only).

3.4 Internal Double Level Debris Screens

The wash sump is provided with two (2) levels of perforated stainless steel filter screens, one coarse and one fine filter. Filter screens are mounted below the floor grating and above the sump coil heater. Both filter screens are removable for servicing and cleaning.

3.5 External Self-Cleaning Filter *NEW!*

The treatment pump is provided with a self-cleaning debris filter having perforations smaller than the spray arm orifices. The filter is inter-piped with the unit's plumbing system to filter all re-circulated solutions and inter-wired with the unit's controls to automatically flush debris to drain.

3.6 Exhaust Vapor Removal Condenser

A cold water vapor condensing unit is provided to reduce excessive vapor and cool the exhaust air prior to entering the building's exhaust system.

3.7 Stainless Steel Exhaust Fan

The washer is provided with a fan inter-wired with the automatic control system to exhaust residual vapors from the unit to building HVAC.



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The fan assembly is of stainless steel construction. This option increases the overall height dimensions of the unit.

3.8 Devapormatic Exhaust System

This is a closed loop system which does not require a connection to building HVAC. The system includes a POV, stainless steel blower, duct work attached to the washer and a cold water condenser to reduce excessive vapor and cool the air returning to the chamber. Facility to provide house cold water.

3.9 Devapormatic Exhaust System Using Chilled Condenser

This is a closed loop system which does not require a connection to building HVAC. The system includes a POV, stainless steel blower, duct work attached to the washer and a chilled water condenser to reduce excessive vapor and cool the air returning to the chamber. Facility to provide the chilled water system.

3.10 Devapormatic Exhaust System Using Atomizing Mist

This is a closed loop system which does not require a connection to building HVAC. The system includes a POV, stainless steel blower, duct work attached to the washer and atomizing nozzles to reduce excessive vapor and cool the air returning to the chamber. Facility to provide house cold water.

3.11 Dryer c/w Devapormatic Exhaust System

This is a closed loop system which does not require a connection to building HVAC. The system includes a POV, stainless steel blower, duct work attached to the washer, a cold water condenser to reduce excessive vapor, and a steam coil which heats the air returning to the chamber. Facility to provide house cold water.

3.12 Dryer c/w Chilled Water Devapormatic System

This is a closed loop system which does not require a connection to building HVAC. The system includes a POV, stainless steel blower, duct work attached to the washer and a chilled water condenser to reduce excessive vapor and a steam coil which heats the air returning to the chamber. Facility to provide the chilled water system.

3.13 Dryer c/w Atomizing Mist Devapormatic System

This is a closed loop system which does not require a connection to building HVAC. The system includes a POV, stainless steel blower, duct work attached to the washer and atomizing nozzles to reduce excessive vapor and a steam coil which heats the air returning to the chamber. Facility to provide house cold water.

3.14 Dryer c/w Vapor Removal Exhaust System

This system requires a connection to building HVAC. It includes a POV, stainless steel blower, duct work attached to the washer, and a steam coil which heats the air returning to the chamber.

3.15 Automatic Chemical Injection Pumps, Time Based

A time based, volumetric type agent injection system is provided to automatically inject user supplied chemicals/agents into the unit's sump.

3.16 Low Level Chemical Sensors

Low level chemical sensors are provided to signal washer when chemical supply stored in containers is almost empty. One to five low level chemical sensors can be added as required.

3.17 Sample Port

A sample port can be added so that chemical concentration can be monitored during normal operation.



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3.18 pH Neutralization for Effluent

Unit is provided with an integral effluent pH neutralization system to adjust effluent pH level within an acceptable range. System comes with a pH probe located within the recirculation piping. During neutralization phase the washer will only proceed to drain if the monitor reading is within the adjustable range.

Note: pH probe may need to be replaced or re-calibrated as part of the preventative maintenance program.

3.19 Automatic Watering Rack Flushing System

A quick disconnect hose and fitting is provided to flush automatic watering type cage racks with fresh water during the final rinse phase.

3.20 VHP, iHP or CD Gas Capability

The unit is designed to accept fittings and connections for VHP, iHP or Chlorine Dioxide decontamination equipment. The user selects their own decontamination equipment; then appropriate fittings and connections are added. All specifications for decontamination systems must be reviewed with our project managers prior to machine construction and design. This option requires item 3.21 Positive Door Seal System to be included.

3.21 Positive Door Seal System

The unit is provided with an inflatable gasket to completely seal the cabinet door(s). This system is to be used in conjunction with VHP, iHP or CD Integration.



Figure 17: Positive Door Seal

3.22 Drain Surge Tank System

The washer is provided with an additional drain tank to allow used wash/rinse solutions to be force drained from the cabinet sump under pump pressure to the Drain Surge Tank. This allows the washer to proceed quickly to the next phase of the cycle. Drain solution is then tempered to below 140°F, then runs from the surge tank to the floor drain under gravity. The option reduces normal process cycles by 5-6 minutes.

3.23 Dedicated Low Volume Drain Pump *NEW!*

A dedicated low volume drain pump is used to assist with evacuating the sump without overflowing the floor drain located in the pit.

3.24 Alkaline/Acid Storage Tanks

The BetterBuilt washer is provided with Alkaline and/or Acid Non-Heated Storage Tanks. This option allows the washer to reduce consumption of energy by saving chemical usage, and hot water consumption. Chemical solutions from each load are saved for subsequent cycles or drained immediately. A counter keeps track of number of usage to alert operators when to refresh the storage tanks.

3.25 Heated Fill Tank

A steam heated fill tank is provided to allow fresh hot water to flow directly to the washer. This option allows the washer to proceed quickly to the next phase of the cycle by eliminating normal sump fill and charge times.

3.26 Heated Rinse Storage Tank *NEW!*

The washer is provided with a steam heated rinse storage tank. This option allows the washer to lower energy consumption by saving hot water and reducing steam demand. Rinse solution from each load is saved for subsequent cycles or drained immediately. A counter keeps track of usage which alerts the operator when to refresh.



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3.27 Chilled Water Drain Cool Down *NEW!*

A facility provided re-circulated chilled water system is used to cool drain water effluent below the required 140°F before discharge to drain. The energy transfer of the chilled water system eliminates the need for cold water injection into the drain line.

3.28 Cold Water Fill *NEW!*

Cold water is used during filling instead of hot water. Feature does not increase steam consumption and will also reduced steam demand. Note: A Heated Fill Tank and Heated Rinse Tank must be included when the Cold Water Fill option is selected.

3.29 Shut-off Valves

Used to isolate steam and water supply line components for maintenance and repair purposes.

3.30 Pressure Gauges

Liquid filled gauges are conveniently installed for monitoring the supply pressure of steam, hot and cold water.

3.31 Temperature Gauges

These gauges monitor hot water supply temperature as well as operational hot water temperature.

3.32 Water Arrestors

Help to prevent water hammering which may cause excessive strain on plumbing components.

3.33 Air Cooled Drain Feature *NEW!*

Cold water injection for cooling of drain is eliminated with this feature. Cooling is done through exhausting of the chamber until the re-circulated water reaches the drain setpoint temperature.

4.0 CONTROL SYSTEM OPTIONS

4.1 8" Touch Screen Control Panel

The controls are upgraded from the standard 5" touch screen to the 8" touch screen interface, to monitor and control all aspects of the washer cycles and process operations. The 8" Touch Screen interface allows for printing directly to a user supplied printer using a USB cable. The 8" Touch Screen option is also required with the CCTV Option.

4.2 Stainless Steel Controls Guard

The unit can be provided with stainless steel guard to protect the touch screen and controls from inadvertent damage.



Figure 18: Stainless Steel Control Guard

4.3 Thermal Cycle Data Printer

An integral thermal printer with automatic paper take-up is provided to record all cycle program and in process performance data including data, times, treatment cycle selected, deviations, and alarms for permanent record.

4.4 Printer Cover

A NEMA 12, IP54 rated plastic printer cover to house both the printer and automatic paper take-up spool. Cover allows for protection of both the printer and take-up spool.



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Figure 19: Printer Cover

4.5 RS485 Port for Data Transfer

An RS485 communication port is provided for the transfer of cycle data to a remote computer terminal or printer. [Software integration to interpret data by others]

4.6 Compact Flash Card - Data Collection

The unit can be provided with a compact flash card allowing Supervisors/Managers the ability to download current cycle data directly to the Flash Card and printing this cycle data offline with a PC or laptop station. Data is automatically stored with a date stamp on the file. Cycle data and parameters can be viewed and printed using MS-Excel software. The CF can store roughly 1-2 years of data.



Figure 20: Sample 64MB CF Card

4.7 Compact Flash Card – Program Backup

The unit can be provided with a compact flash card allowing Supervisors/Managers the ability to save the PLC, and current touchscreen program for storage and safe keeping in the event of a PLC or touchscreen failure.

4.8 Ethernet Connectivity to PLC

The unit is provided with the Remote Data Transfer System (BBRDTTS) where the data files in the compact flash card can be transferred to a central PC via Ethernet and a windows FTP program. The PLC is connected to the facilities network via Ethernet and the supervisor is able to upload, download, and delete data files from each washer control system from their office PC. This option requires coordination between BetterBuilt Engineering and the Facility's IT Department. A main office PC (by others) and Ethernet connection port (by others) near the equipment is required.

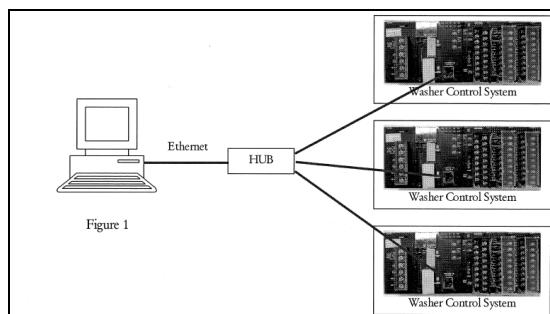


Figure 21: Ethernet /Hub Connection to Equipment PLC Diagram

4.9 Factory Ethernet Connectivity

The unit is provided with an Ethernet connection for remote online diagnostics, software upgrades, and troubleshooting. Factory based service personnel will be able to assist local service remotely identifying system malfunctions and recommendations for repair. This option requires coordination between BetterBuilt Engineering and the Facility's IT Department.

4.10 Touchscreen Ethernet Web Server

Connectivity *NEW!*

The unit is provided with an Ethernet connection to the touchscreen for remote online diagnostics, and troubleshooting. Any approved personnel without any additional software will be able to view the touchscreen parameters right from their PC (by others). The individual will be able to monitor, control, make



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changes or troubleshoot the operation of the unit. This option requires coordination between BetterBuilt Engineering and the Facility's IT Department.

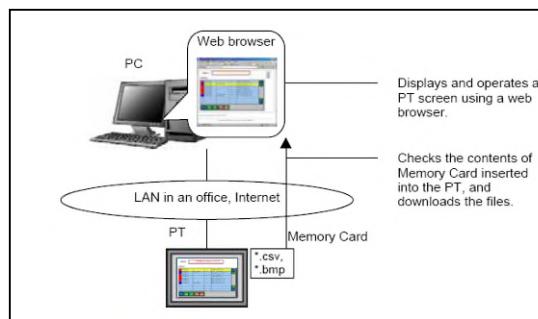


Figure 22: Ethernet /Hub Connection to Equipment Touchscreen Diagram

4.11 Modem

A modem is provided for remote online diagnostics, software upgrades, and troubleshooting. Factory based service personnel will be able to assist local service remotely identifying system malfunctions and recommendations for repair. Dedicated analog phone line required from facility.

4.12 Surge Protection

This device will protect all 120VAC and 24VDC components from electrical transients.

4.13 NEMA Control Box

The unit is provided with a front control box designed to NEMA standards.

4.14 Closed Circuit TV Camera [CCTV]

The unit can be provided with an integral CCTV Camera system allowing operators on the loading end of the washer to view the unload side wash room area. Up to 4 CCTV Cameras can be integrated into the touch screen controls package. Option requires the 8" touchscreen Interface.



Figure 23: CCTV Camera

4.15 Audible Clean Side Buzzer

The buzzer is mounted on the exterior of the washer in the clean side room. It will sound for an adjustable time period at the beginning of a cycle. The buzzer can also be turned on or off for various alarm conditions.

4.16 Emergency Stop Cable (Both Sides)

For operator safety an emergency stop cable is mounted inside the washer on both sides and runs the length of the chamber.

4.17 Activ™ Monitoring

Utility meters for hot water, cold water and steam directly connected to the washer are provided. Information is collected by the washer control system. Can be displayed on printout and in Touchscreen.

4.18 Activ™ VIEW Integration

For complete utility consumption analysis and reports, connection to our Activ™ VIEW system is required. (See Activ™ VIEW data specs)



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5.0 ACCESSORIES

BWC6 Bottle Washing Cart [#206-50104]

A stainless steel, rotary spray manifold cart is provided for processing of up to ten water bottle baskets, based on basket configuration. The Cart-Lock fitting connection allows operators to engage and disengage the floor mounted manifold connection without manual intervention. Cart requires the optional Automatic Manifold Connection.



Figure 24: BWC6 Bottle Washing Cart

AWC6 Aquatics Washing Cart [#206-50105]

A stainless steel, rotary spray manifold cart is provided for processing of Aquatics Cages of various sizes. The Cart-Lock fitting connection allows operators to engage and disengage the floor mounted manifold connection without manual intervention. Cart requires the optional Automatic Manifold Connection. Will require the use of Activ™ San 8 Biofilm Remover.

UC6 Universal Cart [#206-50200]

The BetterBuilt cage and pan washing cart is designed to process common sizes of rodent cages and debris pans, holding them in position for thorough spray coverage. The Universal Cart holds 54 standard mouse cage⁽ⁱ⁾ bottoms or 36 standard rat cage⁽ⁱⁱ⁾ bottoms per load.



Figure 25: UC6 Universal Wash Cart

R-5-4 Universal Basket Rack [#206-50207]

(iv)

The five level R-5-4 Universal Basket Split Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 40 standard mouse cage⁽ⁱ⁾ bottoms or 10 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms or 30 OptiMice bottoms per load.



Figure 26: R-5-4 Universal Basket Split Rack

R-5-8 Universal Basket Rack [#206-50208]

(v)

The five level R-5-8 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 80 standard mouse cage⁽ⁱ⁾ bottoms or 30



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standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load or 64 OptiMice bottoms per load.

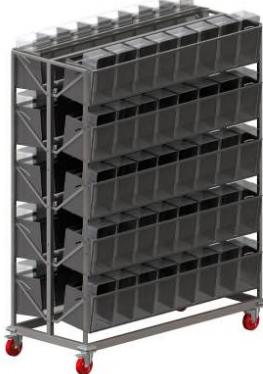


Figure 27: R-5-8 Universal Basket Rack

- R-5-10 Universal Basket Rack [#206-50209]**
The five level R-5-10 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 100 standard mouse cage⁽ⁱ⁾ bottoms or 40 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms or 90 OptiMice bottoms per load.



Figure 28: R-5-10 Universal Basket Rack

- R-4-4 Universal Basket Rack [#206-50204]**
(iv)

The four level R-4-4 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 32 standard mouse cage⁽ⁱ⁾ bottoms or 14 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit

also designed to handle 32 standard OptiMice cages or 16 OptiRat cages per rack.



Figure 29: R-4-4 Universal Basket Split Rack

- R-4-8 Universal Basket Rack [#206-50205]**
(v)

The four level R-4-8 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 64 standard mouse cage⁽ⁱ⁾ bottoms or 36 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit also designed to handle 50 standard OptiMice cages or 24 OptiRat cages per rack.



Figure 30: R-4-8 Universal Basket Rack

- R-4-10 Universal Basket Rack [#206-50206]**

The four level R-4-10 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 80 standard mouse cage⁽ⁱ⁾ bottoms or 44



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standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit also designed to handle 72 standard OptiMice cages or 32 OptiRat cages per rack.



Figure 31: R-4-10 Universal Basket Rack

**R-3-8 Universal Basket Rack [#206-50210]
(v)**

The three level R-3-8 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 48 standard mouse cage⁽ⁱ⁾ bottoms or 30 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit also designed to handle 42 standard OptiMice cages or 18 OptiRat/OptiRat Plus cages per rack.

R-3-10 Universal Basket Rack [#206-50211]

The three level R-3-10 Universal Basket Rack has a unique swing out basket used for washing of soiled rodent cage bottoms, top, or other miscellaneous components. This rack can hold up to 60 standard mouse cage⁽ⁱ⁾ bottoms or 36 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit also designed to handle 54 standard OptiMice cages or 24 OptiRat/OptiRat Plus cages per rack.

VHS6D5 Vertical Header System with Two 5-Level Cage Racks [#206-50521]

A dedicated stainless steel, spray arm assembly is provided to redirect wash/rinse solutions for the high capacity double sided, cage washing racks. The Vertical Header System couples to the Manifold Connection System. The VHS6D5

Vertical Header System consists of one (1) center spray arm assembly and two (2) standard VHS6RD5 Cage Racks.



Figure 32: Vertical Header System

VHS6D5 Vertical Header System with Four 5-Level Cage Racks [#206-50528]

A dedicated stainless steel, spray arm assembly is provided to redirect wash/rinse solutions for the high capacity double sided, cage washing racks. The Vertical Header System couples to the Manifold Connection System. The VHS6D5 Vertical Header System consists of two (2) center spray arm assembly interlocked together and four (4) standard VHS6RD5 Cage Racks.
Note: For R690 model only.

VHS6RD5 Single 5-Level Cage Rack [#206-50525]

One (1) high capacity, stainless steel wash rack is provided to increase washing capacity to 100 standard mouse box cages or 40 rat cages or 90 standard OptiMice cages per rack. Optional VHS6 Vertical Header System is required.



R600 SERIES CAGE & RACK WASHERS



Figure 33: VHS6RD5 Single 5-Level Cage Rack Shown

VHS6D4 Vertical Header System with Two 4-Level Cage Racks [#206-50522]

A dedicated stainless steel, spray arm assembly is provided to redirect wash/rinse solutions for the high capacity double sided, cage washing racks. The Vertical Header System couples to the Manifold Connection System. The VHS6D4 Vertical Header System consists of one (1) center spray arm assembly and two (2) standard VHS6RD4 Cage Racks. The racks have 4 levels to allow for larger cages.

VHS6D4 Vertical Header System with Four 4-level Cage Racks [#206-50529]

A dedicated stainless steel, spray arm assembly is provided to redirect wash/rinse solutions for the high capacity double sided, cage washing racks. The Vertical Header System couples to the Manifold Connection System. The VHS6D4 Vertical Header System consists of two (2) center spray arm assembly interlocked together and four (4) standard VHS6RD4 Cage Racks. The racks have 4 levels to allow for larger cages.

Note: For R690 model only.

VHS6RD4 Single 4-Level Cage Rack [#206-50526]

One (1) high capacity, 4 level stainless steel wash rack is provided to increase washing capacity. This rack can hold up to 80 standard mouse cage⁽ⁱ⁾ bottoms or 32 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit also designed to handle 72 standard OptiMice cages or 32 OptiRat cages per rack. Optional VHS6 Vertical Header System is required.



Figure 34: VHS6RD4 Single 4-Level Cage Rack Shown

VHS6D3 Vertical Header System with Two 3-Level Cage Racks [#206-50523]

A dedicated stainless steel, spray arm assembly is provided to redirect wash/rinse solutions for the high capacity double sided, cage washing racks. The Vertical Header System couples to the Manifold Connection System. The VHS6D3 Vertical Header System consists of one (1) center spray arm assembly and two (2) standard VHS6RD3 Cage Racks. The racks have 3 levels to allow for larger cages.



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VHS6D3 Vertical Header System with Four 3-Level Cage Racks [#206-50530]

A dedicated stainless steel, spray arm assembly is provided to redirect wash/rinse solutions for the high capacity double sided, cage washing racks. The Vertical Header System couples to the Manifold Connection System. The VHS6D3 Vertical Header System consists of two (2) center spray arm assembly interlocked together and four (4) standard VHS6RD3 Cage Racks. The racks have 3 levels to allow for larger cages.

Note: For R690 model only.

VHS6RD3 Single 3-Level Cage Rack [#206-50527]

One (1) high capacity, 3 level stainless steel wash rack is provided to increase washing capacity. This rack can hold up to 60 standard mouse cage⁽ⁱ⁾ bottoms or 36 standard rat cage⁽ⁱⁱ⁾⁽ⁱⁱⁱ⁾ bottoms per load. Unit also designed to handle 54 standard OptiMice cages or 24 OptiRat/OptiRat Plus cages per rack. Optional VHS6 Vertical Header System is required.



Figure 35: VHS6RD3 Single 3-Level Cage Rack Shown

LPR9 Large Processing Rack [#209-50604]

The LPR9 Large Processing stainless steel rack is designed to accommodate 8 to 12 Guinea pig and Rabbit trays.

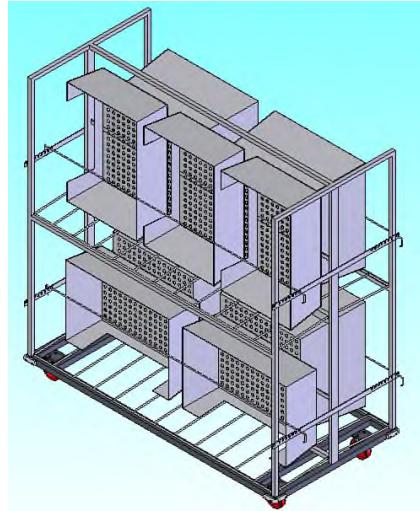


Figure 36: LPR9 Large Processing Rack

PR6 Pan Rack [#206-50005]

The PR6 stainless steel pan rack is designed to accommodate Rabbit Pans or Primate Pans. The rack hangs onto the side of the Rack Washer protection bar and the washer will be able to wash pans at the same time the cages are being washed. Need to know size and type of pans.

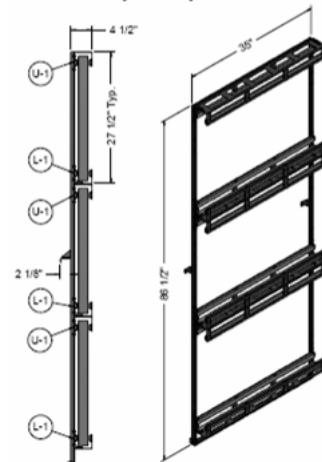


Figure 37: PR6 Pan Rack



**R600 SERIES
CAGE & RACK WASHERS**

IGR6 Interior Guide Rail

The IGR6 Interior Guide Rail is a removable feature that provides a rail to minimize racks from moving within the Rack Washer due to the spraying force. This rail also helps guide racks into the Rack Washer.



Figure 38: IGR6 Interior Guide Rail

ITR6 Interior Tilt Ramp [#206-50001]

The ITR6 Interior Tilt Ramp feature provides an incline within the washing chamber to facilitate draining of solid shelf type racks and/or racks where standing water potential exist.



R600 SERIES CAGE & RACK WASHERS

6.0 OPTIONS CHECK LIST

Configuration Options

Door(s)

- Single
- Two (pass-thru)
- Door Interlocks
- Dual Enlarged Viewing Windows
- Interior Door Bumper(s)

Controls

- Left Side Services
- Right Side Services

Base Type

- Pit Mounted [standard]
- 6" Base Pit Mounted
- Floor Mounted

Installation

- Freestanding
- Recessed One Wall
- Recessed Two Walls
- Seismic Anchors

Spray Coverage

- Overlapping Rotary [standard]
- Horizontal Oscillating Spray Jet System
- Traveling Manifold Spray Jet System
- Direct Rinse for Traveling Manifold System
- Pump Rinse for Traveling Manifold System
- Cart Lock for Accessories
- Automatic Tilt Floor

Equipment Options

Heating Type

- Steam – Water Supply Temperature Booster
- Steam Sump Coil
- Electric - Heaters for Sump Only
(Model R620 and R630)

Filtration

- Internal Double Level Debris Screens
- External Filter

Exhaust / Ventilation

- POV collar with pneumatic vent damper for direct connection to HVAC [standard]
- Exhaust Vapor Removal Condenser
- Power Exhaust Stainless Steel Fan
- Devapormatic Exhaust System, Closed Loop
- Devapormatic Exhaust System, Closed Loop, with Chilled Water
- Devapormatic Exhaust System, Closed Loop, with Atomizing Mist
- Dryer c/w Devapormatic Exhaust System
- Dryer c/w Devapormatic Exhaust System with Chilled Water
- Dryer c/w Devapormatic Exhaust System with Atomizing Mist
- Dryer c/w Vapor Removal Exhaust System

Chemical /Detergent

- Pumps Supplied by Chemical Vendor
- Automatic Chemical Injection Pumps, Time Based
 - One
 - Two
 - Three
 - Four
 - Five
- Low Level Chemical Sensors
 - One
 - Two
 - Three
 - Four
 - Five
- Chemical Sample Port
- pH Neutralizer Controlled by Microprocessor

VHP, iHP or CD Capabilities

- Provide Connections Only
- Complete System Supply
- Pneumatic Door Gasket

Solution Storage / Handling

- One Chemical Storage Side Tank
- Two Chemical Storage Side Tanks
- Power Drain Tank Assembly
- Dedicated Low Volume Drain Pump
- Heated Fill Tank



R600 SERIES CAGE & RACK WASHERS

- Heated Rinse Storage Tank
- Dual Heated Rinse Storage Tanks (CWF)
- Chilled Water Drain Cool Down
- Air Cooled Drain Feature
- Cold Water Filling
- Automatic Watering Rack Flushing System

Valves / Gauges

- Steam and Water Shut-off Valves
- Steam and Water Pressure Gauges
- Hot Water Temperature Gauges
- Water Hammer Arrestors

Control System Options

Controls

- 5" Touchscreen [standard]
- 8" Touchscreen
- Controls Guard

Documentation/Diagnostics

- Printer – Thermal
- NEMA 12, IP54 Protective Cover
- RS485 Port for Remote Data Transfer
- Compact Flash Card – Data Collection
- Compact Flash Card – Program Back-up
- Ethernet Connection to PLC
- Ethernet Connection to Factory
- Touchscreen Ethernet Web Server Connectivity
- Modem
- Activ™ Monitoring
- Activ™ VIEW Integration

Safety

- Surge Protection
- NEMA Control Box
- CCTV - Clean Side
- Audible Buzzer - Clean Side
- Interior Emergency Stop Cable - Both sides

Accessories

- BWC6 Bottle Washing Cart with rotary spray [#206-50104]
 - QTY _____
- AWC6 Aquatics Washing Cart with rotary spray [#206-50105]
 - QTY _____
- UC6 Universal Wash Cart for large cages and pans [#206-50200]
 - QTY _____
- R-5-4 Universal Basket Rack [#206-50207]
 - QTY _____
- R-5-8 Universal Basket Rack [#206-50208]
 - QTY _____
- R-5-10 Universal Basket Rack [#206-50209]
 - QTY _____
- R-4-4 Universal Basket Rack [#206-50204]
 - QTY _____
- R-4-8 Universal Basket Rack [#206-50205]
 - QTY _____
- R-4-10 Universal Basket Rack [#206-50206]
 - QTY _____
- R-3-8 Universal Basket Rack [#206-50210]
 - QTY _____
- R-3-10 Universal Basket Rack [#206-50211]
 - QTY _____



R600 SERIES
CAGE & RACK WASHERS

- VHS6D5 Vertical Header System with Two 5-Level Cage Racks [#206-50521]
 - QTY _____
- VHS6D5 Vertical Header System with Four 5-Level Cage Racks [#206-50528]
 - QTY _____
- VHS6RD5 Single 5-Level Cage Rack [#206-50525]
 - QTY _____
- VHS6D4 Vertical Header System with Two 4-Level Cage Racks [#206-50522]
 - QTY _____
- VHS6D4 Vertical Header System with Four 4-level Cage Racks [#206-50529]
 - QTY _____
- VHS6RD4 Single 4-Level Cage Rack [#206-50526]
 - QTY _____
- VHS6D3 Vertical Header System with Two 3-Level Cage Racks [#206-50523]
 - QTY _____
- VHS6D3 Vertical Header System with Four 3-Level Cage Racks [#206-50530]
 - QTY _____
- VHS6RD3 Single 3-Level Cage Rack [#206-50527]
 - QTY _____
- LPR9 Large Processing Rack for Guinea pig and Rabbit trays [#209-50604]
 - QTY _____
- PPR6 Pan Rack for Rabbit and Primate pans [#209-50005]
 - QTY _____
- IGR6 Interior Guide Rail
 - QTY _____

Electrical Options

- 208VAC, 60 Hz, 3-Phase
- 240VAC, 60 Hz, 3-Phase
- 380VAC, 50 Hz, 3-Phase
- 380VAC, 60 Hz, 3-Phase
- 415VAC, 50 Hz, 3-Phase
- 480VAC, 60 Hz, 3-Phase
- 575VAC, 60 Hz, 3-Phase

ⁱ Standard Mouse Cage Bottom size 7.25" W x 11.5" L x 5" D or [184mm x 292mm x 127mm]

ⁱⁱ Standard Rat Cage Bottom size 11" W x 17" L x 7.25" D or [279mm x 432mm x 184mm]

ⁱⁱⁱ Top row of Standard Rat Cages must be positioned horizontally for load clearance purposes.

^{iv} Cage quantities slightly less for R620 accessories.

^v Typically used in the R620. Cage quantities will be higher if used in other washer.



NSC - BETTERBUILT FEATURE ADVANTAGES

BETTERBUILT R600 SERIES CAGE AND RACK WASHERS

Northwestern System's BetterBuilt Products meet and/or exceeds specifications of Competitive products offering similar features. We offer the following value added features we feel exceed the specified product and offer the Client additional value for their facility and operations.

ENVIRONMENTAL & CONSERVATION FEATURES

CAGE AND RACK WASHER

VALUE ADDED FEATURE: Water Conservation System

Standard with every BetterBuilt R600 Series Cage and Rack Washer the operator has the option to save the final rinse water for the prewash phase of the next cycle, or the operator can choose to dump the final rinse water. By saving the final rinse water for the subsequent prewash, water is conserved. On a standard Alkaline Wash Cycle, it will save approximately 25% hot water, and approximately 25% cold water usage.

VALUE ADDED FEATURE: Reduced Water Consumption

Standard with every BetterBuilt R600 Series Cage and Rack Washer in the last 7 years, the washer has been redesigned to reduce the amount of water held in the sump by approximately 40%. With the reduction in the water level, overall water consumption has been reduced by approximately 40%, which also reduces the steam consumption by approximately 40%, and reduces the cold water usage by approximately 40% since less water will be needed to temper the water to drain.

VALUE ADDED FEATURE: Pressure Sensor Water Level

Standard with every BetterBuilt R600 Series Cage and Rack Washer in the last 7 years, the washer uses a pressure sensor to attain the correct water level in the sump. Use of a pressure sensor instead of a fixed float switch allows for reduced water in the sump depending on the load. With loads that have less water retention, the water level can be reduced to save water usage.

VALUE ADDED FEATURE: Alkaline Detergent Reuse Tank (Optional Adder)

The BetterBuilt Cage and Rack Washer can be ordered with an optional alkaline detergent reuse tank. When using this tank, the alkaline solution is returned to the tank after the wash. Hot water, cold water, steam and alkaline chemical are conserved. On a standard Alkaline Wash Cycle this option saves approximately 25% hot water since the solution is stored in the tank, saves approximately 25% cold water since cold water is not need to tempered the drain solution, saves approximately 15% steam as the alkaline solution only needs to maintain its temperature, not instantaneously increase to the desired temperature, and saves approximately 90% alkaline chemicals since the solution is not drained.

VALUE ADDED FEATURE: Acid Detergent Reuse Tank (Optional Adder)

The BetterBuilt Cage and Rack Washer can be ordered with an optional acid detergent reuse tank. When using this tank, the acid solution is returned to the tank after the acid phase. Hot water, cold water, steam and chemicals are conserved. On a standard Acid Wash Cycle this option saves approximately 25% hot water since the solution is stored in the tank, saves approximately 25% cold

water since cold water is not need to tempered the drain solution, saves approximately 15% steam as the acid solution only needs to maintain its temperature, not instantaneously increase to the desired temperature, and saves approximately 90% acid chemicals and 100% acid neutralization chemicals since the solution is not drained.

VALUE ADDED FEATURE: Rinse Reuse Tank (Optional Adder)

The BetterBuilt Cage and Rack Washer can be ordered with an optional Rinse Reuse Tank. When using this tank, the first rinse solution is returned to the tank after the first rinse phase and is kept heated. Hot water, cold water, steam and chemicals are conserved. On a standard cycle this option saves approximately 25% hot water since the solution is stored in the tank, saves approximately 25% cold water since cold water is not need to tempered the drain solution, and saves approximately 30% steam as the rinse solution only needs to maintain its temperature and not have to instantaneously increase to the desired temperature.

VALUE ADDED FEATURE: Chilled Water Cool Down (Optional Adder)

The BetterBuilt Cage and Rack Washer can be ordered with an optional Chilled Water Cool Down feature. When using this feature, the drain water is cooled down with the use of the facility recirculated chilled water system. This option saves 100% cold water since cold water is not need to tempered the drain solution.

VALUE ADDED FEATURE: Cold Water Fill (Optional Adder)

The BetterBuilt Cage and Rack Washer can be ordered with an optional Cold Water Fill System. When using this feature, the facility can provide the washer with 60°F cold water instead of a typical 120°F hot water. Unlike other competitors, this feature is able to use the cold water instead of hot water without adding any additional heating loads. Through this option the facility's steam consumption is reduced by approximately 20%, cold water consumption for draining is reduced by 100%, and the operational cost of supply water is reduced by approximately 1/3.

VALUE ADDED FEATURE: Vertical Header System (Optional Adder)

The BetterBuilt Cage and Rack washer Vertical Header System places a rotary header system in the middle of the chamber that connects to the manifold connection in the floor. The system consists of one central spray system and two standard VHS-6-D cage racks. This system allows 180 – 200 standard mouse cages to be cleaned in a single wash cycle. This effectively cuts utility consumption by 50% or more as twice the number of cages are cleaned using the same utilities.

ERGONOMIC AND LONGEVITY FEATURES

CAGE AND RACK WASHER

VALUE ADDED FEATURE: **Rotary Spray Arms**

The chamber is provided with stainless steel overlapping rotary spinners. This simple design utilizes the pump pressure to drive the spray arms and provide effective coverage without a secondary mechanism that could fail. All components of the spray arm system are constructed of 304 Stainless Steel. A three piece Teflon bushing assembly protects the spray arm hub and axle from wear.

VALUE ADDED FEATURE: **Materials of Construction**

The wash chamber, sump, and all circulated wetted surfaces are of 14 gauge type 304, #4 finish stainless steel construction. Exterior panels are fastened using 304 type stainless steel fasteners. The chamber doors are manufactured using 16 gauge, type 304, #4 finish stainless steel double wall reinforced construction. No plastic or rubber connections in our circulatory piping system making the washer compatible with all alkaline or acidic detergents and providing added service life.

VALUE ADDED FEATURE: **Easy Access Mechanical Components**

As standard, all BetterBuilt Cage and Rack Washers are designed with the process valve components, pump motors and other mechanical components located on a single (service) side of the washer for easy access and maintenance.

VALUE ADDED FEATURE: **Condensate Piping**

As standard all BetterBuilt Cage and Rack Washers are designed using Schedule 80 black iron for all condensate lines for longer corrosion resistance.

VALUE ADDED FEATURE: **Forged Steel Fittings**

As standard all BetterBuilt Cage and Rack Washers are designed with forged steel fittings on all of our Steam lines for longer life.

VALUE ADDED FEATURE: **Heavy Duty Flanges**

Heavy duty stainless steel flanges at all pneumatic valves. Heavy gauge 15/16" flanges prevent distortion of the valve gasket during transition. Leads to longer parts life.

PRODUCTION EFFICIENCY & EASE OF MAINTENANCE FEATURES

CAGE AND RACK WASHER

VALUE ADDED FEATURE: Solid State Microcomputer Control System

The BetterBuilt R630 Cage and Rack Washer comes standard with our Non-Proprietary OMRON based PLC Controls System. Our controls exceed those typically offered by incorporating the highest level of diagnostic tools available in the marketplace today. Our controls system comes standard with integrated P&ID screens, real time graphical process flow screens, a series of color coded Input/Output Card screens for maintenance troubleshooting purposes. We provide an advanced alarm and data logging screen with detailed descriptions of fault as well as a list of possible causes on screen. We have incorporated a complete Part List ID with Visual Reference screens for verifying, troubleshooting, and identifying the machine's mechanical components on screen. Finally, our newly introduced "ActivPM" system allows proactive maintenance and review of useful life of a variety of machine components.

VALUE ADDED FEATURE: Down Loadable Memory Chip (Optional Adder)

Provided with the BetterBuilt R600 Series Cage and Rack washer is a 64MB Compact Flash Card option. The 64MB Compact Flash Card allows Supervisors to save both their customized PLC program to the card as well as the ability to store their customized Operator Interface screens from the machines touch screen on the same 64MB memory card. This option exceeds the specified download memory chip by allowing the ability to save additional machine critical information.

VALUE ADDED FEATURE: Compact Flash Card Data Collection (Optional Adder)

The unit can be supplied with a 64 MB compact flash card allowing Supervisors/Managers the ability to download current cycle data directly to the flash card. The data is automatically stored and dated and can be downloaded onto a computer, and printed using MS-Excel software. No expensive software is required.

VALUE ADDED FEATURE: Ethernet Connectivity (Optional Adder)

The unit is provided with a remote data transfer system that will allow the Managers/Supervisors to access the data files and download the files directly to their PC. The Ethernet connection will also allow the factory to perform remote online diagnostics, software upgrades, and trouble shooting. Unlike a modem connection, a dedicated analog line is not required. There is not a monthly fee charged by the phone company for the Ethernet line, it is free.

VALUE ADDED FEATURE: Chemical Injection Ports, Contacts and Fittings

The chamber is provided with five (5) chemical injection ports and electrical signals for optional or owner supplied detergent dispensing and chemical treatment pumps. These ports and signals make it very easy to have chemical pumps placed and programmed on the washer.

VALUE ADDED FEATURE: Enlarged Viewing Windows

Enlarged viewing windows are now a standard on our BetterBuilt rack washer. These enlarged windows allow operators to see inside the washer easier. The windows are approximately 3x larger than previous windows.

VALUE ADDED FEATURE: Viewing Windows

Viewing windows on our BetterBuilt rack washers are trimmed on the inside with stainless steel to protect the gasket material. Other manufacturers leave the gasket exposed to alkaline and acid detergents.

VALUE ADDED FEATURE: Vertical Header System (Optional Adder)

The BetterBuilt Cage and Rack washer Vertical Header System places a rotary header system in the middle of the chamber that connects to the manifold connection in the floor. The system consists of

one central spray system and two standard VHS-6-D cage racks. This system allows 180 – 200 mouse cages to be cleaned in a single wash cycle. This effectively doubles production.

VALUE ADDED FEATURE: *Aqua Pulse Spray System*

The washer has the capability to customize its washing pattern within the washer. This Aqua-Pulsing Spray feature allows a facility to allocate more washing duration to one side of the washer compared to the other side. This feature would be advantageous for facilities with Primate Cages, solid back cages or other difficult equipment configurations. For example, the washer is able to wash 70% from one side and 30% from the other side. This feature will reduce cycle time since the spraying is more effective. No oscillating manifold washer can offer this feature.

VALUE ADDED FEATURE: *Spray Jets*

More spray jets for better cleaning. Our R630 washer has 220 individual spray jets providing wash and rinse solution in a forceful, impinging spray pattern for soil removal. Oscillating manifold machines have 120-160 jets issuing solution in a fan pattern for coverage but with less force. The BetterBuilt R630 Cage and Rack Washers offers superior washing capabilities.



C200 SERIES
CHUTE BEDDING
DISPENSERS

www.nsc-betterbuilt.com



C200 SERIES CHUTE BEDDING DISPENSERS

The BetterBuilt C200 Series Chute Bedding Dispenser is designed to accept rodent cages manually placed on the unit and precisely dispense a controlled amount of fresh, free-flowing bedding materials. Variable timed pneumatic valves simultaneously fill bedding into cages aligned beneath dispensing chutes.

Solid Construction for Durability

All dispensers are built with durability in mind. We manufacture these units using all stainless steel construction including the bedding hopper and support structure.

Controls

The unit is provided with a stainless steel operator panel mounted on the side of the machine, complete with on/off, start, stop, E-stop switches, adjustable timers, and indicator lights. The bedding dispenser is controlled by a micro-PLC. Controls can be upgraded to 5" touchscreen with added features.

Storage / Dispensing Hopper

Fresh bedding materials can be manually added to the storage hopper located at the base of the unit. Or, fresh bedding can be automatically delivered to the top dispensing hopper by a Clean Bedding Delivery System such as Sure-Flo™ or Sure-VAC™.

Vacuum Transfer

Bedding materials are conveyed from the lower storage hopper to the upper dispensing hopper by internal vacuum system.

Maintenance Access

The front viewing window provides easy access to the dispensing hopper without tools for maintenance purposes.

Mobility

Unit can be provided with 5" casters providing mobility and flexibility for storage and use.



External Dust Collector

An optional dust containment system can be integrated to the dispenser. The system is designed to capture dust generated during dispensing of the clean bedding materials.



Different Bedding Types

Dispensing of different bedding types including problematic light-weight paper varieties is easily achieved when employing the correct agitation method. We offer sweepers, mixers, agitators and vibration devices.

Controlled Volume

High-speed pneumatic valves ensure a controlled volume of bedding is dispensed into each cage placed beneath each chute. Cage presence sensors confirm a cage is correctly located and ready to accept bedding. Dispensing can be achieved individually or simultaneously. The C200 series bedding dispenser is capable of handling multiple cage types, sizes and dispensing volumes.

Flap Gate Dispensing

Our non-slide gate design uses a pneumatic actuated flap gate which limits dispensing errors.





C200 SERIES CHUTE BEDDING DISPENSERS

APPLICATION

The BetterBuilt C200 Series Chute Bedding Dispenser is a stand-alone unit designed to accept rodent cages manually and dispense a controlled volume of fresh bedding into one or more cages simultaneously.

MODEL

C202

C204

C206

CHUTES

2

4

6

OVERALL (W x D x H)

46" x 30" x 98"

69" x 30" x 98"

93" x 30" x 98"

STANDARD FEATURES

- All Stainless Steel Construction
- Adjustable Stainless Steel Feet
- Self-contained Control Panel
- PLC Controls with On/Off, Start, Stop, E-Stop
- Adjustable Dispensing Timer
- Individual or Multiple Chute Dispensing
- Controlled Dispensing Level
- Cage Presence Sensors

- Vacuum Transfer System
- Pneumatic Dispensing Valves
- High and Low Level Sensors in Storage Hopper
- Clean-out and Service Access Doors
- Hinged Front Viewing Window with Gasket
- Storage Capacity is 12 Cubic Feet
- Non-proprietary Components

OPTIONAL FEATURES

- Right or Left Hand Configuration
- Seismic Anchors
- 5" Swivel Casters w/ Brakes
- Dust Containment System w/ Blower & Bag
- Torit Dust Containment System
- 4" Exhaust Duct Connection
- 4" Inlet for Automated Bedding Delivery
- Agitation System to Promote Bedding Flow
- Integral Air Compressor
- 5" TFT Color Touchscreen Control Panel
- 8" TFT Color Touchscreen Control Panel
- Stainless Steel Control Guard
- Thermal Cycle Data Printer
- Waterproof Printer Cover
- NEMA Rated Control Box
- 8 Fully Adjustable Dispensing Programs

- Program Security via Pin Number Access
- Built-in Advanced Diagnostics
- RS485 Communication Port for Remote Data Transfer
- Compact Flash Card for Data Collection
- PLC and Touchscreen Program Backup
- Ethernet Connectivity to PLC for Data Transfer
- Factory Ethernet Connectivity for Online Diagnostics
- Touchscreen Ethernet Web Server Connectivity
- Modem Connectivity for Factory Diagnostics
- Low Voltage Surge Protection
- Three (3) Phase Power
- Activ™ IAS Integration
- Activ™ View Integration
- Sure-Flo™ Integration
- Sure-VAC™ Integration

RELATED EQUIPMENT

- Tunnel Cage Washers
- Cage and Rack Washers

- Sure-Flo™ Clean Bedding Delivery System
- Sure-VAC™ Clean Bedding Delivery System

DIVISION OF NORTHWESTERN SYSTEMS CORP
7601 MacDonald Road • Delta, British Columbia • Canada V4G 1N3

888-553-0855 • Tel: 604-952-0925 • Fax: 604-952-0941

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Quotation: P5510(2)

24-Aug-20
C200 (2)

To: Dr. Saeed M. Al Sadek

Mobark Saeed Oun Trade Est.

Madinah Road Tower Buliding Sec.Floor Office No:

Jeddah, Saudi Arabia

Project:

King Saudi University Animal House

Chute Bedding Dispenser

Model C200 (#719-10002)

Standard Features

- Stainless steel cabinet with adjustable feet
- Individual Chute dispensing
- Adjustable timer for customized filling times
- Hopper Vacuum Transfer of Bedding
- PLC controls with START / STOP / E-Stop
- Panel mounted control system
- Cage presence sensors

QTY:

1

Base Price, Includes All Standard Features 719-10002

Options Added to Base Price are Listed Below

EQUIPMENT CONFIGURATION

Stand-alone Configuration:

C202 Two Chute Dispenser 719-10002

EQUIPMENT OPTIONS

Vibrator(s) for non-free flowing bedding

Direct Exhaust Connection

Misc.:

Service Side:

Equipment Total	\$41,675.00
Packaging and Handling	\$691.00
(One BetterBuilt Personnel Installation Supervision Assistance - 1 day(s))	Install \$8,740.00
(Flight, accommodations, expenses not included)	FAT \$2,300.00
(One BetterBuilt Personnel Startup Assistance - 1 day(s) only)	Startup \$9,200.00
	Total \$62,606.00

Note: custom conveyor lengths and roller extensions are available, see factory



C200 SERIES CHUTE BEDDING DISPENSERS

PRODUCT DESCRIPTION

The BetterBuilt™ C200 Series Chute Bedding Dispenser is a stand-alone unit designed to accept rodent cages manually and dispense a controlled volume of fresh bedding material into one or more cages simultaneously.

APPLICATION

For use in research animal care laboratories to automatically dispense dry, free flowing, solid bedding material into rodent cages.

STANDARDS

- Certified to UL 508A, Issue: 2001/04/25 Ed: 1 Rev: 2010/02/04 Industrial Control Panels by a third party inspection agency.
- Certified to CSA CAN/CSA-C22.2 No. 14-10 Issue: 2010/02/01 Ed: 11, General Instruction No. 1: 2010/09/01 Industrial Control Equipment by a third party inspection agency.
- Evaluated and conforms to CSA C22.2 No. 94.1-07 First Ed. / UL 50 Twelfth Ed. Enclosures for Electrical Equipment, Non-Environmental Consideration, 09/04/07 by a third party inspection agency.
- Evaluated and conforms to CSA C22.2 No. 94.2-07 First Ed. / UL 50E First Ed. Enclosures for Electrical Equipment, Environmental Consideration, 09/04/07 by a third party inspection agency.

CHOICE OF SIZES

Model	Chutes	Overall W x D x H
C202	2	46 x 30 x 98" [1168 x 762 x 2489mm]
C204	4	69 x 30 x 98" [1753 x 762 x 2489mm]
C206	6	93 x 30 x 96" [2362 x 762 x 2489mm]



1. STANDARD FEATURES

1.1. Stainless Steel Construction

The unit is designed and manufactured using type 304 stainless steel construction including the bedding hopper, support structure, and cabinet.

1.2. Storage/Dispensing Hopper

The storage hopper is located in the base of the unit and the dispensing hopper is located at the top of the unit.

1.3. Vacuum Transfer

Based on level sensors bedding materials are conveyed from the lower storage hopper to the upper dispensing hopper by an internal vacuum system.

1.4. Controlled Dispensing Volume

High-speed pneumatic valves ensure a controlled volume of bedding material is dispensed into each cage placed beneath a chute. Capable of handling multiple cage brands, types and sizes.



C200 SERIES CHUTE BEDDING DISPENSERS

1.5. Flap Gate Dispensing

Non-slide gate design uses a pneumatic actuated flap gate which limits dispensing errors.



Figure 1: Dispensing Chutes

1.6. Presence Sensors

Cage presence sensors confirm a cage is correctly located and ready to accept bedding materials. Dispensing can be achieved individually or simultaneously.

1.7. High and Low Level Sensors

Provided in both the storage and dispensing hopper are high and low level sensors to monitor and regulate the flow of bedding materials.

1.8. Different Bedding Types

Employing the correct agitation method ensures dispensing of different bedding types including problematic light-weight paper varieties is easily achieved. Sweepers, mixers, agitators and vibration devices are used based on the bedding type.

1.9. Controls

The unit is provided with a self-contained stainless steel operator panel complete with on/off, start, stop, E-stop switches, adjustable dispensing timers, and indicator lights. The bedding dispenser is controlled by a Micro-PLC.

1.10. Viewing Window

The hinged front viewing window provides easy access to the dispensing hopper without tools for maintenance purposes.

1.11. Maintenance Access

A hinged and lockable full size access door is provided on the control side on the unit along with other removable access panels for ease of maintenance.

1.12. Adjustable Stainless Steel Legs

The unit is provided with adjustable stainless steel legs for installation and leveling purposes within the facility.

1.13. Non-proprietary Components

All components are non-proprietary and are available from local suppliers or from the factory.

2. CONFIGURATION OPTIONS

2.1. Left or Right Side Controls

The unit comes standard with a choice of either left or right side controls including service access.

2.2. Integration

The dispenser can be integrated with other BetterBuilt products such as Activ™ IAS, Activ™ View, Sure-Flo™ and Sure-VAC™.

2.3. Seismic Anchoring

Unit is provided with seismic anchoring brackets designed in accordance with local seismic codes.

3. EQUIPMENT OPTIONS

3.1. Swivel Casters

Set of four heavy duty 5" swivel casters with brakes. Stainless steel construction with non-marking wheels.

3.2. Blower and Bag Dust Containment System

Unit is provided with a dust collection system to remove dust generated by the filling operation and eliminates the need for connection to the facility exhaust. The Blower and Bag Dust Containment System consists of a 1/3 HP blower



C200 SERIES CHUTE BEDDING DISPENSERS

and 5 micron filter bag connected to the exhaust connection on the dispenser. The system is inter-wired to the bedding dispenser with on/off controls.

3.3. Torit® Dust Containment System

Unit is provided with Torit® self-contained dust collector complete with fan, motor, automatic shaker, and system controller. The compact design minimizes floor space and fits in virtually any layout. The unit comes with one 3 cu ft collection bin with quick release lever for easy removal.

3.4. Direct Exhaust Connection

A 4" diameter exhaust connection is provided on top of the unit for direct connection to building HVAC system.

3.5. Inlet for Automated Delivery

A 4" inlet for automated bedding material delivery is provided on top of the unit for direct connection to a clean bedding delivery system such as Sure-Flo™ or Sure-VAC™.

3.6. Agitation System

To promote bedding material flow various agitation systems are available.

- Sweeper
- Mixer
- Agitator
- Vibration

3.7. Air Compressor

An integral air compressor is provided when facility supplied compressed air is not available for pneumatic component operation.

4. CONTROL SYSTEM OPTIONS

4.1. Touchscreen Control Panel

Standard 5" TFT Color Touchscreen controls are mounted on the service side of the unit and consist of On/Off Switch, Start, Stop, and Emergency Stop push buttons. The touchscreen displays all current cycle data information.

4.2. 8" Touchscreen Control Panel

The controls are upgraded from the standard 5" TFT color touchscreen to the 8" TFT color touchscreen interface, to monitor and control all aspects of the bedding dispenser cycles and process operations. The 8" Touch Screen interface allows for printing directly to a user supplied printer using a USB cable.

4.3. Stainless Steel Controls Guard

The unit can be provided with stainless steel guard to protect the touchscreen and controls from inadvertent damage.

4.4. NEMA Rated Control Box

The unit can be provided with a NEMA Rated control box providing increased protection for vital electronic components.

4.5. Thermal Cycle Data Printer

An integral thermal printer with automatic paper take-up is provided to record all cycle program and in process performance data including data, times, treatment cycle selected, deviations, and alarms for permanent record.

4.6. Printer Cover

A NEMA 12, IP54 rated plastic printer cover to house both the printer and automatic paper take-up spool. Cover allows for protection of both the printer and take-up spool.



Figure 2: Printer Cover



C200 SERIES CHUTE BEDDING DISPENSERS

4.7. RS485 Port for Data Transfer

An RS485 communication port is provided for the transfer of cycle data to a remote computer terminal or printer. [Software integration to interpret data by others]

4.8. Compact Flash Card - Data Collection

The unit can be provided with a 64MB compact flash card allowing Supervisors/Managers the ability to download current cycle data directly to the Flash Card and printing this cycle data offline with a PC or laptop station. Data is automatically stored with a date stamp on the file. Cycle data and parameters can be viewed and printed using MS-Excel software. The 64MB CF can store roughly 1-2 years of data.



Figure 3 - Sample 64MB CF Card

4.9. Compact Flash Card – Program Backup

The unit can be provided with a 64MB compact flash card allowing Supervisors/Managers the ability to save current cycle programs from the PLC, and current touch screen parameters from the Touch Screen panel for storage and safe keeping in the event of a PLC or touch screen failure.

4.10. Ethernet Connectivity to PLC

The unit is provided with the Remote Data Transfer System (BBRDTs) where the data files in the compact flash card can be transferred to a central PC via Ethernet and a windows FTP program. The PLC is connected to the facilities network via Ethernet and the supervisor is able to upload, download, and delete data files from each washer control system from their office PC. This option requires coordination between

Better Built Engineering and the Facility's IT Department. A main office PC (by others) and Ethernet connection port (by others) near the equipment is required.

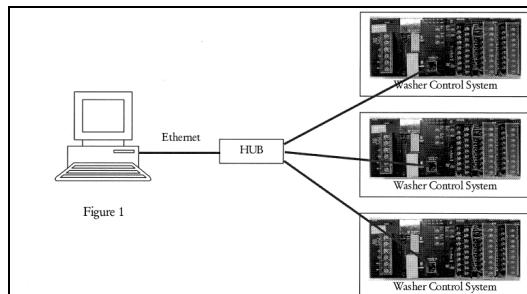


Figure 4 - Ethernet /Hub Connection to Equipment PLC Diagram

4.11. Factory Ethernet Connectivity

The unit is provided with an Ethernet connection for remote online diagnostics, software upgrades, and troubleshooting. Factory based service personnel will be able to assist local service remotely identifying system malfunctions and recommendations for repair. This option requires coordination between Better Built Engineering and the Facility's IT Department.



C200 SERIES CHUTE BEDDING DISPENSERS

4.12. Touchscreen Ethernet Web Server Connectivity

The unit is provided with an Ethernet connection to the touchscreen for remote online diagnostics, and troubleshooting. Any approved personnel without any additional software will be able to view the touchscreen parameters right from their PC (by others). The individual will be able to monitor, control, make changes or troubleshoot the operation of the unit. This option requires coordination between BetterBuilt Engineering and the Facility's IT Department.

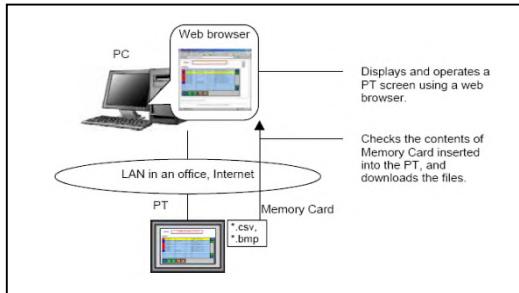


Figure 5: Ethernet /Hub Connection to Equipment Touchscreen

4.13. Modem

A modem is provided for remote online diagnostics, software upgrades, and troubleshooting. Factory based service personnel will be able to assist local service remotely identifying system malfunctions and recommendations for repair. Dedicated analog phone line required from facility.

4.14. Surge Protection

This device will protect all 120VAC and 24VDC components from electrical transients.

4.15. 3 Phase Power

Standard power requirement is 120VAC, 60 Hz, 1 Phase. Optional 208VAC, 60 Hz, 3 Phase power is also available.

4.16. Multi-cycle Microprocessor Control System

A microcomputer with touchscreen interface monitors and controls all aspects of the

dispenser operations. Standard eight (8) fully adjustable programmed dispensing cycles are included. PLC is provided with battery backup of the microcomputer memory in the event of a power failure.

Daily dispensing counts are automatically stored and are displayed on the main screen. Daily, weekly, and monthly dispensing counts are stored and can be accessed on separate user screens.

4.17. Program Security

The controls come standard with the "Advanced Adjustable Multi-Tiered Password Protection System". Cycle programming is set by supervisory personnel to insure process and cycle security. Treatment times, temperature settings, and other key cycle parameters are programmable. A tiered password system is available for incremental access to the various program parameters. As the operator comfort and confidence level increases, Supervisory personnel can grant increased security access to specific program parameters.

	Time/ Temp	Cycle Run	Cycle Done	Adj/ Cal	No. ID	PASS	CYCLE DATA MOD
Password 1	NO	NO	NO	NO	NO	0000	
Password 2	NO	NO	NO	NO	NO	0000	
Password 3	NO	NO	NO	NO	NO	0000	
Password 4	NO	NO	NO	NO	NO	0000	
Password 5	NO	NO	NO	NO	NO	0000	
Password 6	NO	NO	NO	NO	NO	0000	
Password 7	NO	NO	NO	NO	NO	0000	
Password 8	NO	NO	NO	NO	NO	0000	
Password 9	NO	NO	NO	NO	NO	0000	
Password 1	NO	NO	NO	NO	NO	0000	
MASTER	NO	NO	NO	NO	NO	0000	

Figure 6 – PROGRAM SECURITY: Supervisor Tiered Password Screen



C200 SERIES CHUTE BEDDING DISPENSERS

4.18. Built-in Advanced Diagnostics

The controls feature several advanced diagnostics features beyond competitive systems to include:

- Advanced Alarm and Data Logging
- Advanced Diagnostics
- Advanced Maintenance and Troubleshooting
- Parts List ID and Visual Reference
- Technician Mode Coordinated I/O Charts

4.19. Advanced Alarm and Data Logging

This program feature provides user friendly Alarm log, recovery, and checking screens. Additionally, an alarm popup box with description and possible causes for the fault are integrated into the touch screens.

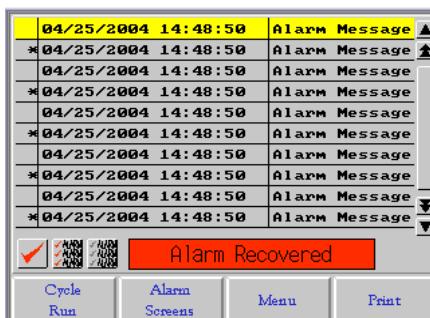


Figure 7 – ADVANCED ALARM AND DATA LOGGING: Alarm Log and Recovery Screen

4.20. Advanced Maintenance and Troubleshooting

The control program is also provided with an integrated P&ID chart screen with touch cell descriptions and an image based Service View screen with touch cell descriptions, providing operators and maintenance personnel a quick visual reference to parts and their descriptive information.

4.21. Parts List ID and Visual Reference

The control program is provide with a Parts List Identification screen complete with pop up visual reference , symbols, and part # ID to assist

operators and maintenance personnel with troubleshooting activities.

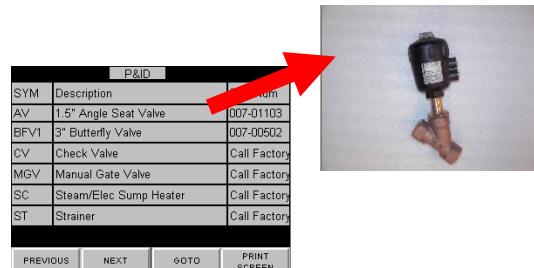


Figure 8 – PARTS LIST ID & VISUAL REFERENCE: Parts List ID Screen

4.22. Technician Mode Coordinated I/O Charts

In the Service/Technician Mode, Technicians are provided the access to coordinated, color coded descriptive information, I/O status, wire number designations, I/O module color for each of the inputs and outputs of the system.

TECHNICIAN MODE	
04/25/2004 14:48:50	REVISOR
Power	OFF
Water Drain Valve [BV1]	OFF
3" Solenoid Valve [AV1]	OFF
Check Valve [CV1]	OFF
1.5" Angle Seat Valve [AV2]	OFF
Manual Gate Valve [MGV1]	OFF
Steam/Elec Sump Heater [SC1]	OFF
Strainer [ST1]	OFF
PREVIOUS NEXT GOTO PRINT SCREEN	

TECHNICIAN MODE	
04/25/2004 14:48:50	REVISOR
Water Drain Valve [BV1]	OFF
3" Solenoid Valve [AV1]	OFF
Check Valve [CV1]	OFF
1.5" Angle Seat Valve [AV2]	OFF
Manual Gate Valve [MGV1]	OFF
Steam/Elec Sump Heater [SC1]	OFF
Strainer [ST1]	OFF
PREVIOUS NEXT GOTO PRINT SCREEN	

TECHNICIAN MODE	
04/25/2004 14:48:50	REVISOR
Emergency Stop [ES1]	OFF
Stop Light	OFF
Door Light	OFF
Close Light	OFF
Open Light	OFF
Bedded Side Door Open Signal	OFF
Bedded Side Door Close Signal	OFF
PREVIOUS NEXT GOTO PRINT SCREEN	

TECHNICIAN MODE	
04/25/2004 14:48:50	REVISOR
Emergency Stop [ES1]	OFF
Stop Light	OFF
Door Light	OFF
Bedded Side Door Open Signal	OFF
Bedded Side Door Close Signal	OFF
PREVIOUS NEXT GOTO PRINT SCREEN	

Figure 9 - TECHNICIAN MODE I/O CHART

4.23. Variable Timed Pneumatic Chute Dispensing

Dispensing is accomplished through a non-slide gate design uses a pneumatic actuated flap gate. Each dispensing volume is variable and time based. Controls allow from multiple cages types, sizes, and dispensing volumes.



C200 SERIES CHUTE BEDDING DISPENSERS

5.0 OPTIONS CHECK LIST

Configuration Options

Controls

- Left Side Services
- Right Side Services

Number of Chute Dispensing

- Two
- Four
- Six

Installation

- Seismic Anchoring Ready

Equipment Options

Ergonomics

- 5" Swivel Casters w/ Brakes

Dust Containment

- Blower and Bag
- 4" Dia. Connection to Facility Exhaust
- Torit® Self-contained System

Bedding Transfer

- Internal Vacuum Transfer [standard]
- Sure-Flo™ S200 Connectivity
- Sure-VAC™ S270 Connectivity

Bedding Agitation

- none [standard]
- Sweeper
- Mixer
- Agitator
- Vibration

Control System Options

Controls

- Push Button with Indicator Lights [standard]
- 5" TFT Color Touchscreen
- 8" TFT Color Touchscreen
- Controls Guard
- NEMA Rated Control Box

Documentation/Diagnostics

- Printer – Thermal
- NEMA 12, IP54 Protective Cover
- RS485 Port for Remote Data Transfer
- Compact Flash Card – Data Collection
- Compact Flash Card – Program Backup
- Ethernet Connection to PLC
- Ethernet Connection to Factory
- Touchscreen Ethernet Web Server Connectivity
- Modem
- Surge Protection
- 3 Phase Power

Electrical Options

- 120VAC, 60 Hz, 1Ph, 15 Amps [standard]
- 220VAC, 50 Hz, 1Ph, 10 Amps



NSC - BETTERBUILT FEATURE ADVANTAGES

BETTERBUILT C200 SERIES STAND-ALONE BEDDING DISPENSERS

Northwestern System's BetterBuilt Products meet and/or exceeds most specifications for a "Chute-style" Stand-alone Bedding Dispenser. We offer the following value added features we feel exceed the specified product and offer the Client additional value for their facility and operations.

ERGONOMIC AND LONGEVITY FEATURES

BEDDING DISPENSER

VALUE ADDED FEATURE: Integration to Sure-Flo or Sure-Vac

The BetterBuilt Bedding Dispensers are able to fully integrate to the Sure-Flo or Sure-Vac system to provide bedding automatically to the unit without having to fill manually.

PRODUCTION EFFICIENCY & EASE OF MAINTENANCE FEATURES

BEDDING DISPENSER

VALUE ADDED FEATURE: Flap Dispensing Design

As a standard, the BetterBuilt Bedding Dispenser utilizes a flap dispensing design instead of slide gates. The flap design provides more robustness than a slide gate which typically needs servicing due to bedding material getting stuck on the slide gates.

VALUE ADDED FEATURE: Dispensing Sensors

As a standard, the BetterBuilt Bedding Dispenser uses dispensing sensors to dispense only when cages are present. This smart feature ensures that bedding is not wasted and dispensed when not needed.

VALUE ADDED FEATURE: Solid State Microcomputer Control System

The BetterBuilt Bedding Dispenser comes standards with our Non-Proprietary OMRON based PLC Controls System. Our controls exceed those typically offered by incorporating the highest level of diagnostic tools available in the marketplace today.

VALUE ADDED FEATURE: Solid State Microcomputer Touchscreen System (Optional)

Available as an option is the addition of a touchscreen to the controls system. System comes with integrated P&ID screens, real time graphical process flow screens, a series of color coded Input/Output Card screens for maintenance troubleshooting purposes. We provide an advanced alarm and data logging screen with detailed descriptions of fault as well as a list of possible causes on screen.



C500 SERIES
CAGE & BOTTLE
WASHERS

www.nsc-betterbuilt.com



C500 SERIES CAGE & BOTTLE WASHERS

The BetterBuilt C500 Series Cage and Bottle Washer is designed for facilities that require a heavy duty washer with the same features as a floor mounted cage washer but in a cabinet configuration.

High Pressure Spray with Total Coverage

Wash and rinse solutions are distributed throughout the chamber by rotating spray arms positioned for complete coverage. Three spray arms are driven by water pressure; one from below, one from each side and one from the top.

Guaranteed Temperatures Throughout the Process Cycle

Chemical suppliers have specific temperature recommendations for best performance from their detergents. Our micro-processor control system allows the user to preset the correct solution temperature for each step of the process and for guaranteed bacteria kill during final rinse.

Micro-processor

Cycles and communication features are controlled by micro-processor. Each cycle can be preset for time, temperature, multiple washes, multiple rinses, chemical additives, exhaust and water saving for maximum efficiency. Programmed wash cycles are protected via pin number access, ensuring up to 11 levels of security. Pre-set temperatures for wash and rinse cycles are guaranteed and are verified with our alarm logging capabilities. Recording of wash cycle data is now available digitally with our optional compact flash card or with our Ethernet connectivity to PLC data retrieval option.



Choice Of Cabinet Size and Door Configuration

You can order your C500 Series washer in one of two cabinet sizes, with a single door or with two doors for pass-thru operation. We also offer drop down doors or vertical lift doors, whichever works best for your facility. Drop down doors become a convenient loading platform in the open position and vertical lift doors provide extra space in those smaller cage wash rooms.



Touchscreen Controls

The touchscreen controls allow the user to easily select from 8 pre-programmed cleaning cycles. The easy to read information screen shows the current operating cycle and stage, actual temperature and time remaining.

Maintenance and Replacement Parts

A preventative maintenance program is required for warranty purposes and is available from a local service agent. All BetterBuilt washers use microprocessor program controllers for long life and ease of service diagnostics. All components are non-proprietary and are available from local suppliers or the factory.

Noise Reduction

Component selection and design engineering have ensured that sound levels around the washer are kept below 80dB which are in line with current worker safety recommendations.

Solid Construction for Durability

All BetterBuilt washers are built for years of service. Stainless steel cabinets and doors are fully welded and polished to a satin finish. The complete solution circulation system, including pumps, flanges and pipe connections are constructed of stainless steel for compatibility with mild acid and alkaline detergents. No plastic or rubber piping connections are used.

LOADING EQUIPMENT & ACCESSORIES

- HIGH CAPACITY LOADING RACK SYSTEM (VHS5) FOR THE C550 HOLDS 72 STANDARD MOUSE CAGES OR 12 RAT CAGES PER LOAD
- HIGH CAPACITY LOADING RACK SYSTEM (VHS5) FOR THE C520 HOLDS 48 STANDARD MOUSE CAGES OR 6 RAT CAGES PER LOAD
- CAPACITY VARIES BASED ON CAGE SIZES USED BY THE FACILITY
- CUSTOM LOADING RACKS ARE AVAILABLE
- FOR BOTTLE WASHING AND GENERAL CLEANING THE BOTTOM ROTARY HEADER (BRH) CART IS USED



C500 SERIES CAGE & BOTTLE WASHERS

APPLICATION

The BetterBuilt C500 Series Washers are automatic, heavy duty, multi-cycle, single chamber, cabinet type, hydro-spray washers using an overlapping, rotary spray arm system for complete coverage.

Note: Due to continued engineering improvements, specifications are subject to change without notice.

	INTERIOR CHAMBER	EXTERIOR CABINET
MODEL	W x H x D	W x H x D
C520	45 x 32 x 32" 1143 x 813 x 813mm	70.5 x 78 x 38" 1791 X 1981 X 965mm
C550	45 x 32 x 42" 1143 x 813 x 1067mm	70.5 x 78 x 52" 1791 X 1981 X 1321mm

STANDARD FEATURES

- Floor Mounted
- All Stainless Steel Construction
- Insulated Double Wall Cabinet and Door(s)
- Manual Drop-down Hinged Door(s)
- Interior Loading Track for Accessories
- Stainless Steel Pump and Circulatory Piping
- Overlapping Rotary Spray System
- Adjustable Spray Patterns
- Automatic Manifold Connection to Accessories
- Temperature Guarantee During All Cycle Phases
- Water Conservation System
- Drain Discharge Cool Down
- Fully Drained and Flushed Solution Sump
- Automatic Sump Level Control

- Double Level Debris Screens in Wash Chamber
- External Self Cleaning Debris Filter
- 5 Chemical Injection Ports, Contacts and Fittings
- Pneumatic Operated Exhaust Damper
- Illuminated Chamber Interior
- Emergency Stop Button at Door(s)
- Automatic Multi Phase Treatment Cycles
- 8 Fully Adjustable Programmed Cycles
- Multi-cycle Microprocessor Control System
- 5" TFT Color Touchscreen Control Panel
- Program Security via Pin Number Access
- Built-in Advanced Diagnostics
- Non-proprietary Components

OPTIONAL FEATURES

- Single Door or Two Door Pass Thru
- Left or Right Side Service Access
- Vertical Lift Door
- Barrier Wall Trim to Close Wall Openings
- Seismic Anchors
- Water Supply Temperature Steam Booster (60°F to 180°F)
- Water Supply Temperature Steam Booster (120°F to 180°F)
- Water Supply Temperature Electric Booster (120°F to 180°F)
- Stainless Steel Steam Coil Sump Heating
- Electric Element Sump Heating
- Vapour Removal Condenser
- Power Exhaust Stainless Steel Blower
- Devapormatic Exhaust System, Closed Loop
- Dryer System c/w POV
- Dryer c/w Devapormatic System
- Automatic Chemical Injection Pumps, Time Based
- Low Level Chemical Sensor

- Sampling Port
- pH Neutralization for Effluent
- Shut-off Valves, Pressure Gauges, Water Arrestors
- 8" TFT Color Touchscreen Control Panel
- Stainless Steel Control Guard
- Impact or Thermal Cycle Data Printer
- Printer Cover
- RS485 Port for Remote Data Transfer
- Compact Flash Card for Data Collection
- PLC and Touchscreen Program Backup
- Ethernet Connectivity to PLC for Data Transfer
- Factory Ethernet Connectivity for Online Diagnostics
- Touchscreen Ethernet Web Server Connectivity
- Modem Connectivity for Factory Diagnostics
- Surge Protection
- CCTV Capabilities for Unload Side Camera
- Clean Side Buzzer

ACCESSORIES

BRH5 Bottom Rotary Header

VHS5 Vertical Header System
VHS5R Cage Rack

TT5 Transfer Cart

DIVISION OF NORTHWESTERN SYSTEMS CORP
7601 MacDonald Road • Delta, British Columbia • Canada V4G 1N3

888-553-0855 • Tel: 604-952-0925 • Fax: 604-952-0941
www.nsc-betterbuilt.com • info@nsc-betterbuilt.com



Quotation: P5510(2)

24-Aug-20
C550 (2)

To: Dr. Saeed M. Al Sadek

Mobark Saeed Oun Trade Est.

Madinah Road Tower Buliding Sec.Floor Office No:

Jeddah, Saudi Arabia

Project:

King Saudi University Animal House

Cage and Bottle Washer Model C550 (#705-00001)

Interior Cabinet Size: 45" wide x 40" high x 45" long

Standard Features

- Floor Mounted
- All Stainless Steel Construction
- Insulated Double Wall Cabinet and Door(s)
- Manual Drop-down Hinged Door(s)
- Interior Loading Tracks for Accessories
- Stainless Steel Pump and Circulatory Piping
- Overlapping Rotary Spray System
- Adjustable Spray Patterns
- Automatic Manifold Connection to Accessories
- Temperature Guarantee During All Cycle Phases
- Water Conservation System
- Drain Discharge Cool Down
- Fully Drained and Flushed Solution Sump
- Automatic Sump Level Control
- Double Level Debris Screens in Wash Chamber
- External Self Cleaning Debris Filter
- 5 Chemical Injection Ports, Contacts and Fittings
- Pneumatic Operated Exhaust Damper
- Illuminated Chamber Interior
- Emergency Stop Button at Door(s)
- Automatic Multi-phase Treatment Cycles
- 8 Fully Adjustable Programmed Cycles
- Multi-cycle Microprocessor Control System
- 5" TFT Color Touchscreen Control Panel
- Program Security via Pin Number Access
- Built-in Advanced Diagnostics
- Non-proprietary Components

QTY: 1

Base Price, Includes All Standard Features 705-00001

Options Added to Base Price are Listed Below

EQUIPMENT CONFIGURATION

Cabinet:

Two Drop-down Doors, Pass-thru

Trim:

Stainless Steel Trim - Both Sides

EQUIPMENT OPTIONS

External HX:

Steam Heat Exchanger 120F - 180F (49C - 82C)

Sump HX:

Steam Sump HX

Exhaust / Ventilation:

POV Collar with Pneumatic Vent Damper for Direct Connection to HVAC

Chemical / Detergent:

Three Peristaltic Chemical Pump

Signal Only to Start Pumps Supplied by Chemical Vendor



Quotation: P5510(2)

24-Aug-20
C550 (2)

To: Dr. Saeed M. Al Sadek

Mobark Saeed Oun Trade Est.

Madinah Road Tower Buliding Sec.Floor Office No:

Jeddah, Saudi Arabia

Project:

King Saudi University Animal House

Cage and Bottle Washer Model C550 (#705-00001)

Misc.:		
Service Side:		
	Equipment Total	\$75,973.00
	Knock Down Ready for Shipment	\$1,562.00
(One BetterBuilt Personnel Installation Supervision Assistance - 2 day(s)	Install	\$10,074.00
(Flight, accommodations, expenses not included)	FAT	\$2,300.00
(One BetterBuilt Personnel Startup Assistance - 1 day(s) only)	Startup	\$9,200.00
	Total	\$99,109.00
Accessories and Loading Equipment : add as required		
BRH5 Pass 550 Two Door Bottle Washing Cart #205-50376	QTY 1	\$6,040.00
VHS5 Pass 550 Two Door Vertical Header with 2 racks #205-50371	1	\$9,146.00
TT5 550 Transfer Cart #205-50374	1	\$2,762.00
	Accessories Sub-total	\$17,947.00
	Total Investment	\$117,056.00



C500 SERIES CAGE & BOTTLE WASHERS

PRODUCT DESCRIPTION

The BetterBuilt C500 Series cage and bottle washers are heavy duty, automatic, single chamber, cabinet type, hydro-spray washers. Both single and double door pass through units are available. Doors can either be drop down or vertical lift type. All units shall be floor mounted and can be freestanding within a room, recessed through one wall, or recessed through two walls. Service access and the control panel can be positioned either on the left or right side of the load door to suit room layout.

APPLICATION

To clean and sanitize cages, utensils, racks, and bottles used in the care and housing of research animals.

STANDARDS¹

- Certified to UL 61010-1 Ed:2 UL Standard for Safety Electrical Equipment For Measurement, Control, and Laboratory Use by a third party inspection agency - ETL.
- Certified to CSA C22.2 No. 61010-1 Ed:2 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use by a third party inspection agency - ETL.
- Evaluated and conforms to IEC 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use by a third party inspection agency - ETL.
- Evaluated and conforms to CENELEC EN 61000-6-4 Electromagnetic Compatibility (EMC) – Part 6-4 Generic Standards – by a third party inspection agency - ETL.
- Evaluated and conforms to CENELEC EN 61000-6-2 Electromagnetic Compatibility (EMC) – Part 6-2 Generic Standards – by a third party inspection agency - ETL.
- Evaluated and conforms to IC ICES-003 & FCC CFR47 Part 15/B Report Measurements by a third party inspection agency - ETL.



CHOICE OF MODELS

Model	Chamber W x H x D	Overall W x H x D	Door Style
C520	45 x 40 x 31" 1143x1016x787 mm	72 x 78 x 38" 1829x1981x965mm	Drop Down
C550	45 x 40 x 45" 1143x1016x1143 mm	72 x 78 x 52" 1829x1981x1321 mm	Drop Down

1.0 STANDARD FEATURES

1.1 Floor Mounted

The standard unit configuration is to be floor mounted for freestanding installation within the facility.

1.2 Construction - Cabinet

The wash chamber, cabinet, and sump including all wetted surfaces are of 14 gauge type 304, #4 finish stainless steel construction.

Exterior chamber shall be of double wall construction, insulated with non-hygroscopic rigid insulation, minimum of 1 inch thick.

1.3 Smooth Sided Chamber Interior

The wash chamber is designed with smooth side wall construction to reduce ledges or corners where gross debris may accumulate.

¹ Steam units only



C500 SERIES CAGE & BOTTLE WASHERS

All interior and exterior joints are sealed to prevent leakage from the chamber.

1.4 Manual Drop-down, Hinged Doors

The unit is provided with manually operated, drop-down, bottom hinged cabinet type door.

1.5 Construction - Doors

The chamber door(s) shall be of 16 gauge, type 304, #4 finish stainless steel double wall reinforced construction. Each door is provided with one tempered glass window.

1.6 Interior Loading Tracks

The washer chamber is provided with internal transfer cart loading tracks to protect the rotary spray arms and load from damage when the washer is loaded and unloaded.

1.7 Stainless Steel Pump and Circulatory Piping

The treatment solutions are re-circulated under pressure from a 7.5 HP (on C520, C550) pump with mechanical seal. All wetted surfaces of the pump shall be Type 316L stainless steel. The pump motor is totally closed, fan cooled (TEFC) with starter, overload protection, and sealed bearings requiring no lubrication.

1.8 Overlapping Rotary Spray System

The wash/rinse chamber is provided with a stainless steel rotary spinner spray/arm system. Spraying arms are designed and located to maximize spray coverage including the underside of racks.

The spray system includes three (3) rotating spray arms, one (1) on the left side, one (1) on the right side and one (1) on the ceiling. Bottom rotary spray arms are included with the optional bottom rotary header cart.

All piping, screens, and other components of the spray system are constructed of Type 304 stainless steel (except wear parts which shall be constructed of Delrin material).

A three piece Teflon/Delrin bushing assembly protects the spray arm hub and axle from wear.

Spray arms are removable for cleaning.

Terminal ends of the spray arms have a removable Teflon cap for spray nozzle cleaning and maintenance.

1.9 Adjustable Spray Patterns

For facilities where soiled loads can be more heavily concentrated on one particular side of the load, each program can be customized to take advantage of the washer's capability for custom spraying patterns. Spray emphasis from either side of the wash chamber is adjustable for duration and modulation frequency from side to side.

1.10 Automatic Manifold Connection to Accessories

The washer is provided with a manifold coupling system to divert re-circulated solution through accessory racks. The coupling connection is automatic to the accessory cart when the cart is positioned into the washer. The manifold flange connection is made without manual fastening by the operator.

1.11 Treatment Temperature Guarantee

The selected wash and/or rinse treatment periods will not begin timing until the re-circulated wash and/or rinse treatment solution temperature reaches the desired set point assuring a minimum temperature during the treatment period.

Each treatment period can be guaranteed for temperature and time with set points locked in by supervision to insure security.

1.12 Water Conservation System

The operator has the option to either save the final rinse water for the subsequent pre-wash phase of the following cycle or automatically discharge the solution to drain at the end of the cycle.



C500 SERIES CAGE & BOTTLE WASHERS

1.13 Drain Discharge Cool Down System

Cold water is automatically injected into the drain discharge to lower the discharge temperature to below 140°F while discharging to the building drain system.

1.14 Full Drained and Flushed Solution Sump

Following the completion of treatment phases the chamber sump is gravity drained or can be power drained based upon site conditions. The drain line is left open for approximately 3-8 seconds (programmable, factory set to 8 seconds) to allow for a sump flush to drain, eliminating debris and residue carryover.

1.15 Automatic Sump Level Control

The washer is provided with automatic level control for recirculation sump to insure sump is filled to the proper level before the pump starts. Design prevents over-filling and is included with an overflow to the drain.

1.16 Internal Double Level Debris Screens

The wash sump is provided with two (2) levels of perforated stainless steel filter screens, one coarse and one fine filter. Filter screens are below the loading tracks and above the sump coil heater. Both filter screens are removable for servicing and cleaning.

1.17 External Self Cleaning Debris Filter

The treatment pump is provided with a self cleaning debris filter having perforations smaller than the spray arm orifices. The filter is inter-piped with the unit's plumbing system to filter all recirculated solutions and inter-wired with the unit's controls to automatically flush debris to drain.

1.18 Chemical Injection Ports, Contacts and Fittings

The chamber is provided with five (5) injection ports and electrical signals for optional or owner supplied detergent dispensing and chemical treatment pumps. All penetrations to the washer chamber for detergent, acids or neutralizers are constructed using a stainless

steel spigot welded at an angle to the unit's chamber.

1.19 Stainless Steel Automatic Damper

The washer chamber is provided with a stainless steel exhaust vent damper with pneumatic actuator in the exhaust line. An electrical signal to the facility's HVAC system is provided.

1.20 Illuminated Chamber Interior

The interior of the chamber shall be illuminated by exterior mounted compact fluorescent light fixture. Illumination is through a sealed tempered glass window to the interior space.

1.21 Emergency Stop Button

One emergency stop button is located at the control panel found next to each door.

1.22 Safety Features

Each machine is provided with the following safety features:

- In the event that either door is opened during the cycle the unit will automatically shut down. The door must be closed before restart can be initiated.
- Cycle start commands cannot occur unless both doors are fully closed.
- Both the load and unload ends of the machine have emergency stop buttons.

1.23 Automatic Multi-Phase Treatment Cycles

The standard treatment cycle consists of the following phases: Pre-Wash, up to 4 Wash phases, up to 3 Rinse phases, Final Rinse, and Exhaust/Dry. All cycle phases can be selected or de-selected with Supervisory access. All cycle phases are adjustable. The cycle once activated is completely automatic. Typical cycle phases are as follows:

○ Pre-Wash

Gross soils and debris are removed using either water retained from the final rinse or fresh domestic hot water (120°F). Water is re-circulated for a preset time period (0000 to 9999 seconds) and then drained to sewer.



C500 SERIES CAGE & BOTTLE WASHERS

- **Wash 2-4**
Hot detergent solution, using fresh domestic hot water controlled at 120° to 160°F, and the preset amount of liquid chemical detergent, the solution is re-circulated for a preset period (0000 to 9999 seconds) and then drained to sewer.
- **Rinse 1 - 3**
Fresh domestic hot water controlled at 120° to 160°F is sprayed over the load from the sump and re-circulated for an operator selected time period (0000 to 9999 seconds) and then drained to sewer.
- **Final Rinse**
Fresh hot water is sprayed over the load and re-circulated for a pre-selected time period (0000 to 9999 seconds). Water temperature is adjustable from 180° to 190°F. Once temperature of re-circulating water reaches selected temperature, the timer is engaged and rinse continues until the time expires. Final rinse water can either be retained for pre-wash or pumped to drain.
- **Exhaust**
Vapor exhaust phase removes hot humid air from the unit's chamber. Selectable time is between 0000 to 9999 seconds.

1.24 Multi-cycle Microprocessor Control System

A microcomputer with 5" touch screen interface monitors and controls all aspects of the washer cycles and process operations.

Standard eight (8) fully adjustable programmed cycles come with the unit. The PLC comes with battery backup of the microcomputer memory in the event of a power failure.



Figure 1 - 5" Touch Screen Interface

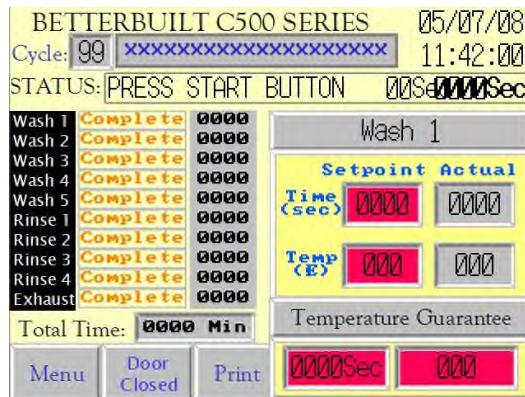


Figure 2 – Cycle In-Process Screen

1.25 Multi-Language Support *NEW!*

The Touchscreen is able to display in multiple languages. The languages to be supported are English, French, Chinese, Korean, and Spanish. If there are other languages desired, please contact BetterBuilt Sales Department.

1.26 Program Security

The controls come standard with the "Advanced Adjustable Multi-Tiered Password Protection System". Cycle programming is set by supervisory personnel to insure process and cycle security. Treatment times, temperature settings, and other key cycle parameters are programmable. A tiered password system is available for incremental access to the various program parameters. As the operator comfort and confidence level increases, Supervisory



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personnel can grant increased security access to specific program parameters.

	Time/ Temp	Cyclic Run	Cyclic Dose	Adj/ Cyl	Re.ID	#Pass	CYCLE DATA MOD
Password 1	NO	NO	NO	NO	NO	00000	
Password 2	NO	NO	NO	NO	NO	00000	
Password 3	NO	NO	NO	NO	NO	00000	
Password 4	NO	NO	NO	NO	NO	00000	
Password 5	NO	NO	NO	NO	NO	00000	
Password 6	NO	NO	NO	NO	NO	00000	
Password 7	NO	NO	NO	NO	NO	00000	
Password 8	NO	NO	NO	NO	NO	00000	
Password 9	NO	NO	NO	NO	NO	00000	
Password 1	NO	NO	NO	NO	NO	00000	
MASTER	NO	NO	NO	NO	NO	00000	

Figure 3 – PROGRAM SECURITY: Supervisor Tiered Password Screen

1.27 Built-in Advanced Diagnostics

The controls feature several advanced diagnostics features beyond competitive systems to include:

- Advanced Alarm and Data Logging
 - Advanced Diagnostics
 - Advanced Maintenance and Troubleshooting
 - Parts List ID and Visual Reference
 - Technician Mode Coordinated I/O Charts
 - Chemical Pump Priming function

1.28 Advanced Alarm and Data Logging

This program feature provides user friendly Alarm log, recovery, and checking screens. Additionally, an alarm popup box with description and possible causes for the fault are integrated into the touch screens.

Figure 4 – ADVANCED ALARM AND DATA LOGGING: Alarm Log and Recovery Screen

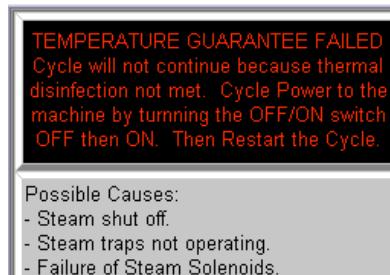


Figure 5 - ADVANCED ALARM AND DATA LOGGING:
Alarm Message Help Screen

1.29 Advanced Diagnostics

The control program is provided with a graphical P&ID flow chart with real-time integrated service flow and Input/Output Summary screen allowing operators and service personnel quick access to machine function status.

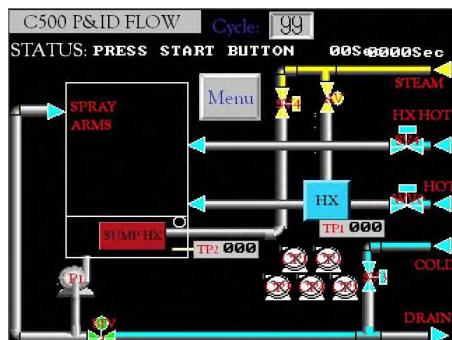


Figure 6 – ADVANCE DIAGNOSTICS - P&ID Chart with Real-time Integrated Service Flow

1.30 Advanced Maintenance and Troubleshooting

The control program is also provided with an integrated P&ID chart screen with touch cell descriptions and an image based Service View screen with touch cell descriptions, providing operators and maintenance personnel a quick visual reference to parts and their descriptive information.



C500 SERIES

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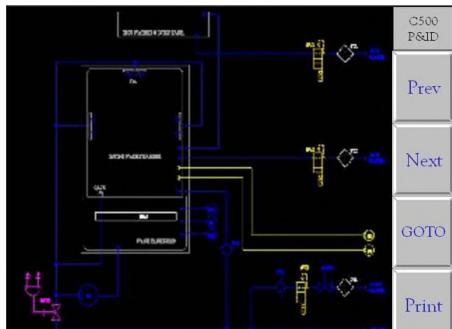


Figure 7 – ADVANCED MAINTENANCE & TROUBLESHOOTING: P&ID Chart Screen

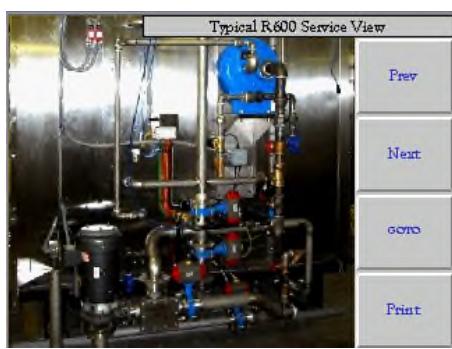


Figure 8 - ADVANCED MAINTENANCE & TROUBLESHOOTING: Services View screen

1.31 Parts List ID and Visual Reference

The control program is provided with a Parts List Identification screen complete with pop up visual reference, symbols, and part # ID to assist operators and maintenance personnel with troubleshooting activities.



Figure 9 – PARTS LIST ID & VISUAL REFERENCE: Parts List ID Screen

1.32 Technician Mode Coordinated I/O Charts

In the Service/Technician Mode, Technicians are provided the access to coordinated, color coded descriptive information, I/O status, wire

number designations, I/O module color for each of the inputs and outputs of the system.

TECHNICIAN MODE		TECHNICIAN MODE	
AVG. (100, 000, 1000) (A/D 16)		AVG. (100, 000, 1000) (A/D 16)	
Power	OFF	Power	OFF
Start/Pause Function (Hold Shift)	OFF	Start/Pause Function (Hold Shift)	OFF
Stop/Eject Function	OFF	Stop/Eject Function	OFF
Door Sensor - Solid Side Closed (L)	OFF	Door Sensor - Solid Side Closed (L)	OFF
Door Sensor - Clear Side Closed (R)	OFF	Door Sensor - Clear Side Closed (R)	OFF
Door Sensor - Clear Side Open (L)	OFF	Door Sensor - Clear Side Open (L)	OFF
Dry/Fog Function (Clear Side)	OFF	Dry/Fog Function (Clear Side)	OFF
PREVIOUS	NEXT	GOTO	PRINT SCREEN
TECHNICIAN MODE		TECHNICIAN MODE	
AVG. (100, 000, 1000) (A/D 16)		AVG. (100, 000, 1000) (A/D 16)	
Power	OFF	Power	OFF
Start/Pause Function (Hold Shift)	OFF	Start/Pause Function (Hold Shift)	OFF
Stop/Eject Function	OFF	Stop/Eject Function	OFF
Door Sensor - Solid Side Open (R)	OFF	Door Sensor - Solid Side Open (R)	OFF
Door Sensor - Clear Side Open (L)	OFF	Door Sensor - Clear Side Open (L)	OFF
Door Sensor - Clear Side Open (R)	OFF	Door Sensor - Clear Side Open (R)	OFF
Dry/Fog Function (Solid Side)	OFF	Dry/Fog Function (Solid Side)	OFF
PREVIOUS	NEXT	GOTO	PRINT SCREEN
TECHNICIAN MODE		TECHNICIAN MODE	
AVG. (100, 000, 1000) (A/D 16)		AVG. (100, 000, 1000) (A/D 16)	
Power	OFF	Power	OFF
Start/Pause Function (Hold Shift)	OFF	Start/Pause Function (Hold Shift)	OFF
Stop/Eject Function	OFF	Stop/Eject Function	OFF
Door Sensor - Solid Side Closed (L)	OFF	Door Sensor - Solid Side Closed (L)	OFF
Door Sensor - Clear Side Closed (R)	OFF	Door Sensor - Clear Side Closed (R)	OFF
Door Sensor - Solid Side Open (R)	OFF	Door Sensor - Solid Side Open (R)	OFF
Door Sensor - Clear Side Open (L)	OFF	Door Sensor - Clear Side Open (L)	OFF
Dry/Fog Function (Solid Side)	OFF	Dry/Fog Function (Solid Side)	OFF
PREVIOUS	NEXT	GOTO	PRINT SCREEN

Figure 10 - TECHNICIAN MODE I/O CHART

1.33 Statistics Mode and Active PM **NEW!**

The control system is provided with a statistics mode that keeps track of a wide variety of parameters. Parameters such as per Cycle Usage, Total number of Cycles Operated, Hours of Operations, and much more.

GENERAL STATISTICS			
Cycles	OP	PM Sch	
Cycle 1	██████████	██████████	Reset
Cycle 2	██████████	██████████	Reset
Cycle 3	██████████	██████████	Reset
Cycle 4	██████████	██████████	Reset
Cycle 5	██████████	██████████	Reset
Cycle 6	██████████	██████████	Reset
Cycle 7	██████████	██████████	Reset
Cycle 8	██████████	██████████	Reset

Figure 11 – General Statistics Screen

In addition to the recording of general statistics, this mode can be used to forecast a PM (Preventative Maintenance) Schedule, referred to as Activ™ PM. Each component is actively monitored for usage so that scheduled Preventative Maintenance programs will be more proactive. The control system will alert the maintenance personnel through a data log when each individual component has reached their anticipated life expectancy.



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STATISTICS			
24VDC OUTPUT CARD (16-23)	OP	PM Sch	
Main Water Inlet Valve [AV5]	0000000	0000000	Reset
HX Steam Inlet Valve [AV1]	0000000	0000000	Reset
Final Spray Valve [AV6]	0000000	0000000	Reset
Dryer Steam Coil Valve [AV2]	0000000	0000000	Reset
Rinse Inlet Water Valve [AV7]	0000000	0000000	Reset
Rinse Steam Sump Coil Valve [AV3]	0000000	0000000	Reset
Rinse Gravity Drain Valve [BFV]	0000000	0000000	Reset
Wash Inlet Water Valve [AV8]	0000000	0000000	Reset

Figure 12 – Active PM Screen

1.34 Chemical Pump Priming Function

The control program is provide with a Chemical Pump Priming screen to allow supervisory and chemical agent personnel the ability to pre-program an adjustable time for chemical pump priming during chemical drum change out procedures. Feature insures that chemical lines are primed with chemical prior to washer operations during the cycle process.

CHEMICAL PRIMING		
CHEMICAL PUMP 1:	OFF	00
CHEMICAL PUMP 2:	OFF	00
CHEMICAL PUMP 3:	OFF	00
CHEMICAL PUMP 4:	OFF	00
CHEMICAL PUMP 5:	OFF	00

Figure 13 – CHEMICAL PUMP PRIMING FUNCTION: Chemical Priming Screen

1.35 Non-proprietary Components

All components are non-proprietary and are available from local suppliers or from the factory.

2.0 CONFIGURATION OPTIONS

2.1 Single or Two Door Pass-Thru

The washer is available in a single door configuration or as a two door pass-thru. The unload end is provided with an operator status interface. **Note: Model C520 only available as single door unit.**

2.2 Vertical Split Door(s)

These doors are insulated and feature a split door design for facilities with limited space. The split door will have a seam in the middle of the door. When opening the door, the top half of the door will slide up while the bottom half of the door will cantilever out for ease of loading and unloading.

2.3 Left or Right Side Service Access

The unit comes standard with a choice of either left or right side service access.

2.4 Barrier Wall Trim to Close Wall Openings

Stainless steel trim strips and flanges are provided for recessed wall openings or at barrier wall enclosures.

2.5 Seismic Anchoring

Washer is provided with seismic anchoring brackets designed in accordance with local seismic codes.



C500 SERIES CAGE & BOTTLE WASHERS

3.0 EQUIPMENT OPTIONS

3.1 Water Supply Temperature Booster

The washer is supplied with an in-line instantaneous steam heat exchanger to raise the temperature of the incoming hot water supply to the desired temperature. The standard unit will raise incoming water temperature from 120°F to 180°F. The optional unit will raise incoming water temperature from 60°F to 180°F.

3.2 Stainless Steel Steam Coil Heating

The wash chamber sump is provided with a steam heated, stainless steel, and tubular sump coil to maintain solution temperature as it re-circulates within the wash chamber.

Both the heat exchanger and sump heating coil are sized adequately to operate with a maximum incoming steam pressure of 60 psig.

The steam coil is designed to ASME Section VIII, Div. 1, Unfired Pressurized Vessel Code.

A bucket trap is provided for the steam water supply temperature booster. A thermostatic steam trap is provided for the steam sump coil.

3.3 Electric Water Supply Temperature Booster

The washer is equipped with an external mounted electric hot water booster tank which raises the temperature of supplied hot water as required. These units will raise the temperature of facility supplied water from 120°F to 180°F.

3.4 Electric Element Sump Heating

Electric immersion heating elements are provided in the unit's sump in lieu of steam coil heating to maintain re-circulated solution temperature.

3.5 Exhaust Vapor Removal Condenser

A cold water vapor condensing unit is provided to reduce excessive vapor and cool the exhaust air prior to entering the building's exhaust system.

3.6 Stainless Steel Exhaust Fan

The washer is provided with a fan inter-wired with the automatic control system to exhaust residual vapors from the unit. The fan assembly is of stainless steel construction. This option increases the overall height dimensions of the unit.

3.7 Devapormatic Exhaust System

This is a closed loop system which does not require a connection to building HVAC. The system includes a POV, stainless steel blower, duct work attached to the washer and a cold water condenser to reduce excessive vapor and the cool air returning to the chamber.

3.8 Dryer c/w Devapormatic Exhaust System

This system does not require a connection to building HVAC. The system includes a POV, stainless steel blower, duct work attached to the washer, a cold water condenser to reduce excessive vapor, and a steam coil which heats the air returning to the chamber.

3.9 Dryer c/w Vapor Removal Exhaust System

This system requires a connection to building HVAC. It includes a POV, stainless steel blower, duct work attached to the washer, and a steam coil which heats the air returning to the chamber.

3.10 Automatic Chemical Injection Pumps, Time Based

A time based, volumetric type agent injection system is provided to automatically inject user supplied chemicals/agents into the unit's sump.

3.11 Low Level Chemical Sensors

Low level chemical sensors are provided to signal washer when chemical supply stored in containers is almost empty. One to five low level chemical sensors can be added as required.



C500 SERIES CAGE & BOTTLE WASHERS

3.12 Sample Port

A sample port can be added so that chemical concentration can be monitored during normal operation.

3.13 pH Neutralization for Effluent

Unit is provided with an integral effluent pH neutralization system to adjust effluent pH level within an acceptable range. System comes with a pH monitor located within the recirculation piping. During neutralization phase the washer will only proceed to drain if the monitor reading is within the adjustable range.

Note: pH probe may need to be replaced or re-calibrated as part of the preventative maintenance program.

3.14 Shut-off Valves

Used to isolate steam and water supply line components for maintenance and repair purposes.

3.15 Pressure Gauges

These liquid filled gauges are conveniently installed for monitoring the supply pressure of steam, hot and cold water.

3.16 Temperature Gauges

These gauges monitor hot water supply temperature as well as operational hot water temperature.

3.17 Water Arrestors

Help to prevent water hammering which may cause excessive strain on plumbing components.

4.0 CONTROL SYSTEM OPTIONS

4.1 8" Touch Screen Control Panel

The controls are upgraded to the 8" touch screen interface, to monitor and control all aspects of the washer cycles and process operations. The 8" Touch Screen interface allows for printing directly to a user supplied printer using a USB cable. The 8" Touch Screen option is also required with the CCTV Option.

4.2 Stainless Steel Controls Guard

The unit can be provided with stainless steel guard to protect the touch screen and controls from inadvertent damage.



Figure 14 – Stainless Steel Control Guard

4.3 Impact or Thermal Cycle Data Printer

An integral thermal or dot matrix printer with automatic paper take-up is provided to record all cycle program and in process performance data including data, times, treatment cycle selected, deviations, and alarms for permanent record.

4.4 Printer Cover

A NEMA 12, IP54 Rated plastic printer cover to house both the printer and automatic paper take-up spool. Cover allows for protection of both the printer and take-up spool.



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Figure 15 – Printer Cover

4.5 RS485 Port for Data Transfer

An RS485 communication port is provided for the transfer of cycle data to a remote computer terminal or printer. [Software integration to interpret data by others]

4.6 Compact Flash Card - Data Collection

The unit can be provided with a 64MB compact flash card allowing Supervisors/Managers the ability to download current cycle data directly to the Flash Card and printing this cycle data offline with a PC or laptop station. Data is automatically stored with a date stamp on the file. Cycle data and parameters can be viewed and printed using MS-Excel software. The 64MB CF can store roughly 1-2 years of data.



Figure 16 - Sample 64MB CF Card

4.7 Compact Flash Card – Program Backup

The unit can be provided with a compact flash card allowing Supervisors/Managers the ability to save the PLC, and current touchscreen program for storage and safe keeping in the event of a PLC or touchscreen failure.

4.8 Ethernet Connectivity to PLC

The unit is provided with the Remote Data Transfer System (BBRDTS) where the data files in the compact flash card can be transferred to a central PC via Ethernet and a windows FTP program. The PLC is connected to the facilities network via Ethernet and the supervisor is able to upload, download, and delete data files from each washer control system from their office PC. This option requires coordination between Better Built Engineering and the Facility's IT Department. A main office PC (by others) and Ethernet connection port (by others) near the equipment is required.

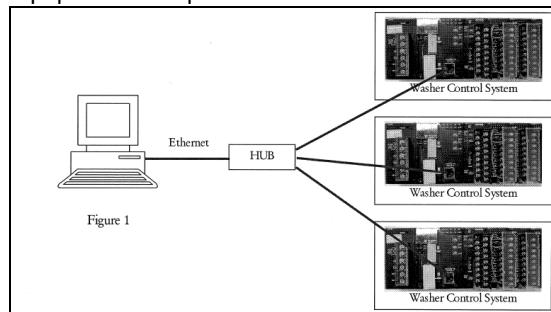


Figure 17 - Ethernet /Hub Connection to Equipment PLC Diagram

4.9 Factory Ethernet Connectivity

The unit is provided with an Ethernet connection for remote online diagnostics, software upgrades, and troubleshooting. Factory based service personnel will be able to assist local service remotely identifying system malfunctions and recommendations for repair. This option requires coordination between Better Built Engineering and the Facility's IT Department.

4.10 Touchscreen Ethernet Web Server

Connectivity *NEW!*

The unit is provided with an Ethernet connection to the Touchscreen for remote online diagnostics, and troubleshooting. Any approved personnel without any additional software will be able to view the touchscreen parameters right from their PC (by others). The individual will be able to monitor, control, make changes or troubleshoot the operation of the unit. This option requires coordination between



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BetterBuilt Engineering and the Facility's IT Department.

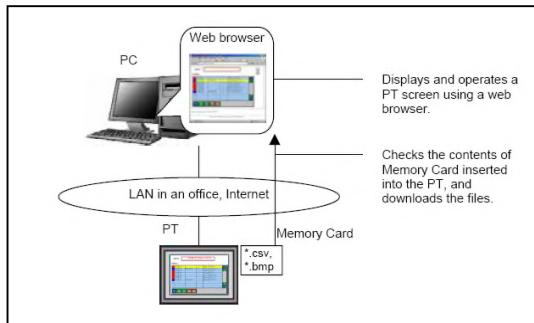


Figure 18 - Ethernet /Hub Connection to Equipment Touchscreen Diagram

4.11 Modem

A modem is provided for remote online diagnostics, software upgrades, and troubleshooting. Factory based service personnel will be able to assist local service remotely identifying system malfunctions and recommendations for repair.

4.12 Surge Protection

This device will protect all 120VAC and 20VDC components from electrical transients.

4.13 Closed Circuit TV Camera [CCTV]

The unit can be provided with an integral CCTV Camera system allowing operators on the loading end of the washer to view the unload side wash room area. Up to 4 CCTV Cameras can be integrated into the touch screen controls package. Option requires the 8" Touch Screen Interface.



Figure 19 - CCTV Camera

4.14 Audible Clean Side Buzzer

The buzzer is mounted on the exterior of the washer in the clean side room. It will sound for an adjustable time period at the beginning of a cycle. The buzzer can also be turned on or off for various alarm conditions.



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5.0 ACCESSORIES

High Capacity Cage Processing System – VHSS

A two sided vertical spray manifold is added to the center of the washer for additional coverage over two high capacity cage holding racks. The vertical spray manifold connects simply and easily to the washers spray system.

Model C520: Rack Capacity is 48 mouse cages

Model C550: Rack Capacity is 72 mouse cages



Figure 20 – VHSS High Capacity Cage Processing System

Bottom Rotary Header – BRH5

A stainless steel flat deck cart with four rotary spray arms connects easily to the washers re-circulated spray system. This cart is designed for washing bottles in baskets and general cleaning.



Figure 21 – BRH5 Bottom Rotary Header

Transfer Cart – TT5

The mobile transfer cart is available for handling and storage of loading equipment.

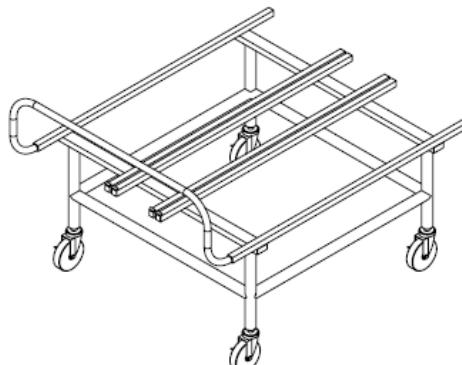


Figure 22 – TT5 Transfer Cart



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6.0 OPTIONS CHECK LIST

Configuration Options

Door(s)

- Single
- Two (pass-thru C550 only)

Door Style

- Manual Drop Down [standard]
- Vertical Split Door

Controls

- Left Side Services
- Right Side Services

Installation

- Freestanding
- Recessed One Wall
- Recessed Two Walls
- Seismic Anchors

Equipment Options

Heating Type

- Steam – water supply temperature booster and sump coil
- Electric – water supply temperature booster and sump element heater
- Electric – sump element heater (180°F min. water supply)

Exhaust / Ventilation

- POV collar with pneumatic vent damper for direct connection to HVAC [standard]
- Exhaust Vapor Removal Condenser
- Power Exhaust Stainless Steel Fan
- Devapormatic Exhaust System, closed loop
- Dryer c/w Devapormatic Exhaust System
- Dryer c/w Vapor Removal Exhaust System

Chemical / Detergent

- Pumps Supplied by Chemical Vendor
- Automatic Chemical Injection Pumps, Time Based
 - One

- Two
- Three
- Four
- Five

- Low Level Chemical Sensors

- One
- Two
- Three
- Four
- Five

- Chemical Sample Port

- pH Neutralizer Controlled by Microprocessor

Valves / Gauges

- Steam and Water Shut-off Valves
- Steam and Water Pressure Gauges
- Hot Water Temperature Gauges
- Water Hammer Arrestors

Control System Options

Controls

- 5" Touchscreen [standard]
- 8" Touchscreen
- Controls Guard

Documentation/Diagnostics

- Printer – Thermal
- Printer – Impact
- NEMA 12, IP54 Protective Cover
- RS485 Port for Remote Data Transfer
- Compact Flash Card – Data Collection
- Compact Flash Card – Program Backup
- Ethernet Connection to PLC
- Ethernet Connection to Factory
- Touchscreen Ethernet Web Server Connectivity
- Modem

Safety

- Surge Protection
- CCTV - Clean Side
- Audible Buzzer - Clean Side



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Accessories

VHS5 High Capacity Processing System

o QTY _____

VHS5R High Capacity Processing Rack

o QTY _____

BRH5 Bottom Rotary Header

o QTY _____

TT5 Transfer Cart

o QTY _____

Electrical Options

208VAC, 60 Hz, 3-Phase

240VAC, 60 Hz, 3-Phase

380VAC, 50 Hz, 3-Phase

380VAC, 60 Hz, 3-Phase

415VAC, 50Hz, 3-Phase

480VAC, 60 Hz, 3-Phase

575VAC, 60 Hz, 3-Phase



Terms and Conditions:

1. Net Price US Funds.
2. No local, state, county or Federal Taxes or Duty included. If applicable, such taxes shall be paid directly to the respective authority by the purchaser of the equipment.
3. FOB NSC/BetterBuilt Factory
4. Freight cost based upon facility having a loading dock and ability to receive 53' long trailers. If facility cannot accommodate freight cost will be increased.
5. Does not include off loading, uncrating, or setting in place, however, Northwestern Systems can arrange local installation if required. Pricing for installation shall be confirmed following a site visit.
6. It should be possible to carry out the installation, commissioning and qualification work without hindrance in any way by any adjacent installation or part thereof.
7. It should be possible to carry out all work during normal working hours (8 a.m. to 8 p.m.) and in consecutive order. If necessary, it should be possible to carry out work outside normal working hours. Cost for facility to allow installers to work outside of normal working hours not to be charged to NSC/BetterBuilt. Work outside normal working hours at the request of the ordering party will be charged at premium time rates.
8. Any alteration to building is not included.
9. Please reference Sure-Flo or Sure-VAC or Undercounter Terms and Conditions if Sure-Flo or Sure-VAC or Undercounters are quoted.
10. Any needed building permits are not included
11. Final Utility connections to building services not included. To be provided by others not by Northwestern Systems Corp.
12. Warranty: One year from date of installation on parts or 18 months after shipment whichever comes first. All warranty labor cost to be supplied by Dealer. See NSC Warranty statement for further details and conditions of the warranty.
13. Submittal Package submitted within 2-3 weeks after receipt of purchase order. Fabrication time is typically between 120-150 day(s) from receipt of approval submittals.
14. Pricing firm for 60 day(s).
15. Start-up and staff training by Dealer Representative.
16. Payment terms: 50% with order, LC or full payment to the value of 50% on shipping date.
17. Purchase order and/or payment to be issued directly to Northwestern Systems Corp.
18. Order Cancellation: by written notice only, based on the work completed and in progress, on the materials purchased and/or on order at the cancellation date (10% after Purchase Order, up to 25% after drawing approval, rising up to 100% based upon work completed), plus any other associated costs incurred.
19. The title and ownership of said materials and equipment shall remain vested in the Seller until the purchase price has been paid in full. Purchaser shall not permit any lien or encumbrance or security interest adverse to Seller's title to be placed on the items being sold hereunder.
20. This agreement shall be governed by and construed in accordance with the laws of the Province of British Columbia, Canada.
21. All drawings, specifications, quote, etc... provided by Northwestern Systems Corp to the Buyer in the course, or in connection with, or for the purposes of the Contract (a) shall remain(a) shall remain the property of the Company, and (b) are confidential information of the Company and the Buyer shall hold the same in secrecy and shall not disclose the plans or any information contained therein to anyone other than employees or other representatives who have a need to know for purpose of determining the goods to be purchased and negotiating agreement terms, or for the installation, integration and operation of the goods. The Buyer may not copy any machine or machine parts supplied by the Company, nor allow any third party to do so. Where the Company supplies goods or parts to the Buyer's design, the Buyer shall take sole responsibility for such design and hold the Company harmless and indemnified against any action suit or claim for infringement of any patent trade mark or other proprietary rights.
22. Unless specifically accounted for in a Quote Summary Sheet, pricing does not include any performance bonds. Bonds are available for an additional cost.



- 23. Subject to Exceptions and Clarifications... document #.
- 24. Due to potential travel restrictions because of Covid-19 or any unforeseen issues, installation supervision and startup by BetterBuilt personnel could be done by video conferencing with local service organizations.

by Harry Lim
BetterBuilt President

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