

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	ES4400 Dish Machine or Equal	12.00000	MO	290.000000	3480.00

Comm Code	Manufacturer	Specification	Model #
48101615			

Commodity Line Comments: * Ecolab bids the current model of the ES4400, the EC44.
 * Ecolab requires the use of Ecolab Dishmachine Chemicals when leasing Ecolab Dishmachines, chemicals are available on Contract: AMA 0608 0608 DCR2200000047 1
 * Ecolab requires a Product Purchase amount of \$500.00 per month with the lease of this machine
 No Cost for Standard Delivery and Installation.
 Location will be responsible for any of the following if they occur:
 * Electrical Work | * Plumbing | * Steel work | * Venting

Extended Description:
 Dish washing Equipment for 37 locations

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
3	ES6600 Dish Machine or Equal	12.00000	MO	425.000000	5100.00

Comm Code	Manufacturer	Specification	Model #
48101615			

Commodity Line Comments: * Ecolab bids the current model of the ES6600, the EC66
 * Ecolab requires the use of Ecolab Dishmachine Chemicals when leasing Ecolab Dishmachines, chemicals are available on Contract: AMA 0608 0608 DCR2200000047 1
 * Ecolab requires a Product Purchase amount of \$550.00 per month with the lease of this machine
 No Cost for Standard Delivery and Installation.
 Location will be responsible for any of the following if they occur:
 * Electrical Work | * Plumbing | * Steel work | * Venting

Extended Description:
 Dish washing Equipment for 37 locations

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
4	ES8000 Dish Machine or Equal	12.00000	MO	1450.000000	17400.00

Comm Code	Manufacturer	Specification	Model #
48101615			

Commodity Line Comments: * Ecolab bids the machine as specified, ES8000 (Jackson AJ-80)
 * Ecolab requires the use of Ecolab Dishmachine Chemicals when leasing Ecolab Dishmachines, chemicals are available on Contract: AMA 0608 0608 DCR2200000047 1
 * Ecolab requires a Product Purchase amount of \$1,200.00 per month with the lease of this machine
 * This is a specialty dishmachine, that is assembled to order. Due to this, Ecolab requires the facility to keep the machine for a term of 7 years.
 * Typical Lead Time for this specialty dishmachine is at minimum 4 weeks.
 * Requires Ecolab Regional Vice President approval before order can be placed.
 No Cost for Standard Delivery and Installation.
 Location will be responsible for any of the following if they occur:
 * Electrical Work | * Plumbing | * Steel work | * Venting

Extended Description:
 Dish washing Equipment for 37 locations

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
5	EC66HH Dish Machine or Equal	12.00000	MO	465.000000	5580.00

Comm Code	Manufacturer	Specification	Model #
48101615			

Commodity Line Comments: * Ecolab bids the EC66HH
 * Ecolab requires the use of Ecolab Dishmachine Chemicals when leasing Ecolab Dishmachines, chemicals are available on Contract: AMA 0608 0608 DCR2200000047 1
 * Ecolab requires a Product Purchase amount of \$550.00 per month with the lease of this machine
 No Cost for Standard Delivery and Installation.
 Location will be responsible for any of the following if they occur:
 * Electrical Work | * Plumbing | * Steel work | * Venting

Extended Description:
 Dish washing Equipment for 37 locations

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
6	XL-HT Dish Machine or Equal	12.00000	MO	200.000000	2400.00

Comm Code	Manufacturer	Specification	Model #
48101615			

Commodity Line Comments: * Ecolab bids the XL-HT
 * Ecolab requires the use of Ecolab Dishmachine Chemicals when leasing Ecolab Dishmachines, chemicals are available on Contract: AMA 0608 0608 DCR2200000047 1
 * Ecolab requires a Product Purchase amount of \$300.00 per month with the lease of this machine
 No Cost for Standard Delivery and Installation.
 Location will be responsible for any of the following if they occur:
 * Electrical Work | * Plumbing | * Steel work | * Venting

Extended Description:
 Dish washing Equipment for 37 locations

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
7	EC66-LW Dish Machine or Equal	12.00000	MO	465.000000	5580.00

Comm Code	Manufacturer	Specification	Model #
48101615			

Commodity Line Comments: * Ecolab bids the EC66-LW
 * Ecolab requires the use of Ecolab Dishmachine Chemicals when leasing Ecolab Dishmachines, chemicals are available on Contract: AMA 0608 0608 DCR2200000047 1
 * Ecolab requires a Product Purchase amount of \$550.00 per month with the lease of this machine
 No Cost for Standard Delivery and Installation.
 Location will be responsible for any of the following if they occur:
 * Electrical Work | * Plumbing | * Steel work | * Venting

Extended Description:
 Dish washing Equipment for 37 locations

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
8	Delivery and Installation	1.00000	EA	0.000000	0.00

Comm Code	Manufacturer	Specification	Model #
72153609			

Commodity Line Comments: No Cost for Standard Delivery and Installation.
 Location will be responsible for any of the following if they occur:
 * Electrical Work | * Plumbing | * Steel work | * Venting

Extended Description:

Delivery and Installation

EXHIBIT A – Pricing Page
ARFQ DCR2300000148
Dish Machine Lease
Division of Corrections and Rehabilitation

Section	Description	Manufacturer and Model if Bidding "or Equal" products	Unit of Measure	Quantity	Unit Cost	Extended Cost
3.1.1	ES4400 Dish Machine	Ecolab Inc. EC44 Dish Machine	Month	12	\$290.00	\$ 3,480.00
3.1.2	ES6600 Dish Machines	Ecolab Inc. EC66 Dish Machine	Month	12	\$425.00	\$ 5,100.00
3.1.3	ES8000 Dish Machines	Ecolab Inc. ES8000 (Jackson AJ-80) *Special Order Dish Machine*	Month	12	\$1,450.00	\$ 17,400.00
3.1.4	EC66HH Dish Machines	Ecolab Inc. EC66HH Dish Machine	Month	12	\$465.00	\$ 5,580.00
3.1.5	XL-HT Dish Machines	Ecolab Inc. XL-HT Dish Machine	Month	12	\$200.00	\$ 2,400.00
3.1.6	EC66-LW Dish Machine	Ecolab Inc. EC66-LW Dish Machine	Month	12	\$465.00	\$ 5,580.00
3.1.8	Delivery and Installation	No Cost for Standard Delivery and Installation. Location will be responsible for any of the following if they occur: * Electrical Work * Plumbing * Steel work * Venting	Each	1	\$0.00	\$ -
Overall Total Cost					\$	39,540.00

Please note: This information is being captured for auditing purposes.
 Vendor should complete the Pricing Page in full as failure to complete the Pricing Page in its entirety will result in Vendor's bid being disqualified. A no bid entered on the Pricing Page will result in Vendor's bid being disqualified. Any product or service not on the Agency provided Pricing Page will not be allowable. The state cannot accept alternate pricing pages, failure to use Exhibit A Pricing Page will lead to disqualification of vendors bid.
 Vendor should type or electronically enter the information into the Pricing Page to prevent errors in the evaluation.

BIDDER /VENDOR INFORMATION:

Vendor Name:	Ecolab Inc.
Address:	1 Ecolab Place
City, St. Zip:	St. Paul, MN 55102
Phone No.:	1-800-352-5326
Email Address:	Gov.sales@ecolab.com

Bum Spring
 Vendor Signature:

8/21/2023
 Date:

REQUEST FOR QUOTATION
ARFQ 0608 DCR2300000148
Dish machine Lease - DCR

SPECIFICATIONS

1. PURPOSE AND SCOPE: The West Virginia Division of Administrative Services is soliciting bids on behalf of the Division of Corrections and Rehabilitation to establish a contract for commercial dish machine equipment leases.

2. DEFINITIONS: The terms listed below shall have the meanings assigned to them below. Additional definitions can be found in section 2 of the General Terms and Conditions.

2.1 “Contract Services” means various leasing of commercial dish machine equipment as more fully described in these specifications.

2.2 “CPI” means Consumer Price Index.

2.3 “Pricing Page” means the pages, contained wvOASIS or attached hereto as Exhibit A, upon which Vendor should list its proposed price for the Contract Services.

2.4 “Solicitation” means the official notice of an opportunity to supply the State with goods or services that is published by the Division of Administrative Services.

3.MANDATORY REQUIREMENTS:

3.1 Mandatory Contract Services Requirements and Deliverables: Contract Services must meet or exceed the mandatory requirements listed below.

3.1.1 ES4400 Dish Machine, or equal, leasing contract, plus any optional accessories or equipment.

3.1.1.1 Must consist of an operating capacity of at least 78 racks per hour.

3.1.1.2 Must consist of a minimum operating temperature of at least 120° Fahrenheit for the wash and rinse cycle.

3.1.1.3 Must consist of a voltage/frequency/phase: of 115V/60Hz/1 Ph.

3.1.1.4 Must consist of a waterline size of a minimum of ¾.”

3.1.1.5 Must consist of a flow pressure of 15-25 PSI.

3.1.1.6 Must consist of a drain line size of 2” minimum.

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3.1.2 ES6600 Dish Machines, or equal, leasing contract, plus any optional accessories or equipment.

3.1.2.1 Must have a minimum operating capacity of at least 248 racks per hour.

3.1.2.2 Must consist of an operating temperature of at least 160° Fahrenheit for the wash and rinse cycle.

3.1.2.3 Must consist of a voltage/frequency/phase: of 208V/60Hz/1 Ph.

3.1.2.4 Must consist of a waterline size of a minimum of ¾.”

3.1.2.5 Must consist of a flow pressure of 15-25 PSI.

3.1.2.6 Must consist of a drain size 2” minimum.

3.1.3 ES8000 Dish Machines, or equal, leasing contract, plus any optional accessories or equipment.

3.1.3.1 Must have an operating capacity of at least 248 racks per hour.

3.1.3.2 Must consist of a minimum operating temperature of at least 160° Fahrenheit for the wash and rinse cycle.

3.1.3.3 Must consist of a waterline size of a minimum of ¾.”

3.1.3.4 Must consist of a flow pressure of 15-25 PSI.

3.1.3.5 Must consist of a drain size 2” minimum.

3.1.3.6 Must consist of voltage/frequency/phase of: 208V/60Hz/1 Phase.

3.1.4 EC66HH Dish Machines, or equal, leasing contract, plus any optional accessories or equipment.

3.1.4.1 Must have an operating capacity of at least 244 racks per hour.

3.1.4.2 Must consist of a minimum operating temperature of at least 160° Fahrenheit for the wash and rinse cycle.

3.1.4.3 Must consist of a waterline size of a minimum of ½.”

3.1.4.4 Must consist of a flow pressure of 15-25 PSI.

3.1.4.5 Must consist of a drain size 1 1/2” minimum.

3.1.4.6 Must consist of voltage/frequency/phase of: 208V/60Hz/1 Phase.

3.1.5 XL-HT Dish Machines, or equal, leasing contract, plus any optional accessories or equipment.

3.1.5.1 Must have an operating capacity of at least 57 racks per hour.

3.1.5.2 Must consist of a minimum operating temperature of at least 150° Fahrenheit for the wash and rinse cycle.

3.1.5.3 Must consist of a waterline size of a minimum of ½.”

3.1.5.4 Must consist of a flow pressure of 15-25 PSI.

3.1.5.5 Must consist of a drain size 1 1/2” minimum.

3.1.5.6 Must consist of voltage/frequency/phase of: 208V/60Hz/1 Phase.

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- 3.1.6 EC66-LW Dish Machine, or equal, leasing contract, plus any optional accessories or equipment.**
- 3.1.6.1** Must have an operating capacity of at least 57 racks per hour.
 - 3.1.6.2** Must consist of a minimum operating temperature of at least 150° Fahrenheit for the wash and rinse cycle.
 - 3.1.6.3** Must consist of a waterline size of a minimum of ½.”
 - 3.1.6.4** Must consist of a flow pressure of 15-25 PSI.
 - 3.1.6.5** Must consist of a drain size 1 1/2” minimum.
 - 3.1.6.6** Must consist of voltage/frequency/phase of: 208V/60Hz/1 Phase.
- 3.1.1** Vendor shall lease said machines to Agency under a one-year contract, which may be renewed each succeeding year, for five (5) additional years, by mutual written agreement of both parties.
- 3.1.2** Vendor must perform all preventative and corrective maintenance, including parts, of said machines at no cost to the Agency, in order to maintain the equipment in good operating condition.
- 3.1.3** Equipment must be compatible with Ecolab chemical products. The Agency has an open-end contract for said chemicals and all facilities are mandated to purchase chemicals from said contract.
- 3.1.4** Lease prices under this Agreement will remain in effect for a minimum of one-year. Vendor may request a price increase by giving Agency a 30-day written notice prior to the anniversary date of said contract.
- 3.1.5** Agency reserves the right to add additional, newer equipment to said contract, when pricing is agreed upon between both parties.
- 3.1.6 Substitution of Contract Items:**
- 3.1.6.1** The Vendor may substitute a contract item if it becomes discontinued or is no longer available for purchase provided that the substitute/alternate item is equal to or greater than the contract item is offered at the same cost as the original contract item being replaced. Any item being substituted for a contract item must have prior written approval from the Agency.
- 3.1.7** Agency is responsible for providing proper electrical requirements for the dish machines.
- 3.1.8** Vendor shall be responsible for delivery and installation of all dish machines at any of the Division of Corrections locations throughout the State of West Virginia as they become necessary. Please see exhibit B

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for list of locations.

4 CONTRACT AWARD:

- 4.1 Contract Award:** The Contract is intended to provide Agency with a purchase price for the Contract Services. The Contract shall be awarded to the Vendor that provides the Contract Services meeting the required specifications for the lowest overall total cost as shown on the Pricing Pages.
- 4.2 Piggyback Clause:**
- 4.2.1** The West Virginia Division of Corrections and Rehabilitation (WVDCR) reserves the right to extend the terms, conditions, and prices of this contract to other Agencies/Institutions who express an interest in piggybacking on this contract. Each of the piggyback Agencies/Institutions will issue their own purchasing documents for the goods/services. Vendor agrees that WVDCR shall bear no responsibility or liability for any agreements between Vendor and the other Agency/Institutions who desires to exercise this option.
- 4.3 Pricing Page:** Vendor should complete the Pricing Page by providing a unit cost for the Contract Items listed in section 3.1.1.1. Vendor shall include the cost of standard order delivery charges in its bid pricing and is not permitted to charge the Agency separately for such delivery. Vendor should complete the Pricing Page in full as failure to complete the Pricing Page in its entirety will result in Vendor's bid being disqualified.

Vendor should type or electronically enter the information into the Pricing Pages through wvOASIS, if available, or as an electronic document. In most cases, the Vendor can request an electronic copy of the Pricing Pages for bid purposes by sending an email request to the following address: Jessica.L.Burnsmcdonnell@wv.gov

Any product or service not on the Agency provided Pricing Pages will not be allowable. The state cannot accept alternate pricing pages, failure to use Exhibit A Pricing Pages will lead to disqualification of vendors bid.

- 4.4** The vendor may, thirty (30) days prior to the contract anniversary date, request a price adjustment. Said price adjustment will be considered based on the prior year CPI compared to the current year CPI, or 3%, whichever is less. Agency must approve all price adjustments prior to implementation.

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- 5 PERFORMANCE:** Vendor and Agency shall agree upon a schedule for performance of Contract Services and Contract Services Deliverables, unless such a schedule is already included herein by Agency. In the event that this Contract is designated as an open-end contract, Vendor shall perform in accordance with the release orders that may be issued against this Contract.
- 6 PAYMENT:** Agency shall pay monthly lease payments, as shown on the Pricing Pages, for all Contract Services performed and accepted under this Contract. Vendor shall accept payment in accordance with the payment procedures of the State of West Virginia.
- 7 TRAVEL:** Vendor shall be responsible for all mileage and travel costs, including travel time, associated with performance of this Contract. Any anticipated mileage or travel costs may be included in the monthly lease rate listed on Vendor's bid, as such costs will not be paid by the Agency separately.
- 8 FACILITIES ACCESS:** Performance of Contract Services may require access cards and/or keys to gain entrance to Agency's facilities. In the event that access cards and/or keys are required:
- 8.1.** Vendor must identify principal service personnel which will be issued access cards and/or keys to perform service.
 - 8.2.** Vendor will be responsible for controlling cards and keys and will pay replacement fee if the cards or keys become lost or stolen.
 - 8.3.** Vendor shall notify Agency immediately of any lost, stolen, or missing card or key.
 - 8.4.** Anyone performing under this Contract will be subject to Agency's security protocol and procedures.
 - 8.5.** Vendor shall inform all staff of Agency's security protocol and procedures.
- 9 VENDOR DEFAULT:**
- 9.1.** The following shall be considered a vendor default under this Contract.
 - 9.1.1.** Failure to perform Contract Services in accordance with the requirements contained herein.
 - 9.1.2.** Failure to comply with other specifications and requirements contained herein.

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9.1.3. Failure to comply with any laws, rules, and ordinances applicable to the Contract Services provided under this Contract.

9.1.4. Failure to remedy deficient performance upon request.

9.2. The following remedies shall be available to Agency upon default.

9.2.1. Immediate cancellation of the Contract.

9.2.2. Immediate cancellation of one or more release orders issued under this Contract.

9.2.3. Any other remedies available in law or equity.

10 MISCELLANEOUS:

10.1. Contract Manager: During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

Contract Manager: JB Bennett
Telephone Number: 248-752-6564
Fax Number: 651-306-5429
Email Address: Jb.Bennett@ecolab.com

INSTRUCTIONS TO VENDORS SUBMITTING BIDS

1. REVIEW DOCUMENTS THOROUGHLY: The attached documents contain a solicitation for bids. Please read these instructions and all documents attached in their entirety. These instructions provide critical information about requirements that if overlooked could lead to disqualification of a Vendor's bid. All bids must be submitted in accordance with the provisions contained in these instructions and the Solicitation. Failure to do so may result in disqualification of Vendor's bid.

2. MANDATORY TERMS: The Solicitation may contain mandatory provisions identified by the use of the words "must," "will," and "shall." Failure to comply with a mandatory term in the Solicitation will result in bid disqualification.

2A. PREBID MEETING: The item identified below shall apply to this Solicitation.

A pre-bid meeting will not be held prior to bid opening

A MANDATORY PRE-BID meeting will be held at the following place and time:

All Vendors submitting a bid must attend the mandatory pre-bid meeting. Failure to attend the mandatory pre-bid meeting shall result in disqualification of the Vendor's bid. No one individual is permitted to represent more than one vendor at the pre-bid meeting. Any individual that does attempt to represent two or more vendors will be required to select one vendor to which the individual's attendance will be attributed. The vendors not selected will be deemed to have not attended the pre-bid meeting unless another individual attended on their behalf. The required attribution of attendance to a single vendor should be addressed during the pre-bid but may occur at any time deemed appropriate by the Agency.

An attendance sheet provided at the pre-bid meeting shall serve as the official document verifying attendance. Any person attending the pre-bid meeting on behalf of a Vendor must list on the attendance sheet his or her name and the name of the Vendor he or she is representing.

Additionally, the person attending the pre-bid meeting should include the Vendor's E-Mail address, phone number, and Fax number on the attendance sheet. It is the Vendor's responsibility to locate the attendance sheet and provide the required information. Failure to complete the attendance sheet as required may result in disqualification of Vendor's bid.

All Vendors should arrive prior to the starting time for the pre-bid. Vendors who arrive after the starting time but prior to the end of the pre-bid will be permitted to sign in, but are charged with knowing all matters discussed at the pre-bid.

Questions submitted at least five business days prior to a scheduled pre-bid will be discussed at the pre-bid meeting if possible. Any discussions or answers to questions at the pre-bid meeting are preliminary in nature and are non-binding. Official and binding answers to questions will be published in a written addendum to the Solicitation prior to bid opening.

3. BID SUBMISSION: All bids must be submitted electronically through wvOASIS or signed and delivered by the Vendor to the Agency on or before the date and time of the bid opening. Any bid received by the Agency staff is considered to be in the possession of the Agency and will not be returned for any reason.

3A. BID SUBMISSION

A bid that is not submitted electronically through wvOASIS should contain the information listed below on the face of the envelope or the bid may be rejected by the Agency.

SEALED BID:	Yes
BUYER:	Jessica Burns-McDonnell email to: Jessica.L.Burnsmcdonnell@wv.gov
SOLICITATION NO.:	ARFQ DCR2300000148
BID OPENING DATE:	August 8, 2023 (8/8/2023)
BID OPENING TIME:	10:00 AM EST
FAX NUMBER:	304-558-1426

4. ADDENDUM ACKNOWLEDGEMENT: Changes or revisions to this Solicitation will be made by an official addendum issued by the Agency. Vendor should acknowledge receipt of all addenda issued with this Solicitation by completing an Addendum Acknowledgment Form, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

5. BID FORMATTING: Vendor should type or electronically enter the information onto its bid to prevent errors in the evaluation. Failure to type or electronically enter the information may result in bid disqualification.

6. ALTERNATE MODEL OR BRAND: Unless the box below is checked, any model, brand, or specification listed in this Solicitation establishes the acceptable level of quality only and is not intended to reflect a preference for, or in any way favor, a particular brand or vendor. Vendors may bid alternates to a listed model or brand provided that the alternate is at least equal to the model or brand and complies with the required specifications. The equality of any alternate being bid shall be determined by the State at its sole discretion. Any Vendor bidding an alternate model or brand should clearly identify the alternate items in its bid and should include manufacturer’s specifications, industry literature, and/or any other relevant documentation demonstrating the equality of the alternate items. Failure to provide information for alternate items may be grounds for rejection of a Vendor’s bid.

This Solicitation is based upon a standardized commodity. Vendors are expected to bid the standardized commodity identified. Failure to bid the standardized commodity will result in your firm’s bid being rejected.

7. **EXCEPTIONS AND CLARIFICATIONS:** The Solicitation contains the specifications that shall form the basis of a contractual agreement. Vendor shall clearly mark any exceptions, clarifications, or other proposed modifications in its bid. Exceptions to, clarifications of, or modifications of a requirement or term and condition of the Solicitation may result in bid disqualification.

8. **REGISTRATION:** Prior to Contract award, the apparent successful Vendor must be properly registered with the Agency and must have paid the \$125 fee, if applicable.

9. **UNIT PRICE:** Unit prices shall prevail in cases of a discrepancy in the Vendor's bid.

10. **ELECTRONIC FILE ACCESS RESTRICTIONS:** Vendor must ensure that its submission in wvOASIS can be accessed and viewed by the Agency staff immediately upon bid opening. The Agency will consider any file that cannot be immediately access and viewed at the time of the bid opening (such as, encrypted files, password protected files, or incompatible files) to be blank or incomplete as context requires, and therefore unacceptable. A vendor will not be permitted to unencrypt files, remove password protections, or resubmit documents after bid opening to make a file viewable if those documents are required with the bid. A Vendor may be required to provide document passwords or removed access restrictions to allow the Agency to print or electronically save documents provided that those documents are viewable by the Agency prior to obtaining the password or removing the access restriction.

11. **NON-RESPONSIBLE:** The Director of Administrative Services reserves the right to reject the bid of any vendor as Non-Responsible, when the Director determines that the vendor submitting the bid does not have the capability to fully perform, or lacks the integrity and reliability to assure good-faith performance.

12. **ACCEPTANCE/REJECTION:** The State may accept or reject any bid in whole, or in part.

13. **YOUR SUBMISSION IS A PUBLIC DOCUMENT:** Vendor's entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, Freedom of Information Act in West Virginia Code §§ 29B-1-1 et seq.

DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Agency constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Agency will disclose any document labeled "confidential," "proprietary," "trade secret," "private," or labeled with any other claim against public disclosure of the documents, to include any "trade secrets" as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

GENERAL TERMS AND CONDITIONS:

1. CONTRACTUAL AGREEMENT: Issuance of a Award Document signed by the Agency and approved as to form by the Attorney General's office, if required, constitutes acceptance of this Contract made by and between the State of West Virginia and the Vendor. Vendor's signature on its bid signifies Vendor's agreement to be bound by and accept the terms and conditions contained in this Contract.

2. DEFINITIONS: As used in this Solicitation/Contract, the following terms shall have the meanings attributed to them below. Additional definitions may be found in the specifications included with this Solicitation/Contract.

2.1. "Agency" or "Agencies" means the agency, board, commission, or other entity of the State of West Virginia that is identified on the first page of the Solicitation or any other public entity seeking to procure goods or services under this Contract.

2.2. "Bid" or "Proposal" means the vendors submitted response to this solicitation.

2.3. "Contract" means the binding agreement that is entered into between the State and the Vendor to provide the goods or services requested in the Solicitation.

2.4. "Director" means the Director of the West Virginia Division of Administrative Services.

2.5. "Award Document" means the document signed by the Agency that identifies the Vendor as the contract holder.

2.6. "Solicitation" means the official notice of an opportunity to supply the State with goods or services.

2.7. "State" means the State of West Virginia and/or any of its agencies, commissions, boards, etc. as context requires.

2.8. "Vendor" or "Vendors" means any entity submitting a bid in response to the Solicitation, the entity that has been selected as the lowest responsible bidder, or the entity that has been awarded the Contract as context requires.

3. **CONTRACT TERM; RENEWAL; EXTENSION:** The term of this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below:

Term Contract

Initial Contract Term: This Contract becomes effective on the date indicated on the awarded contract and extends for a period of one (1) year(s).

Renewal Term: This Contract may be renewed upon the mutual written consent of the Agency, and the Vendor. Any request for renewal should be delivered to the Agency thirty (30) days prior to the expiration date of the initial contract term or appropriate renewal term. A Contract renewal shall be in accordance with the terms and conditions of the original contract. Unless otherwise specified below, renewal of this Contract is limited to five (5) successive one (1) year periods or multiple renewal periods of less than one year, provided that the multiple renewal periods do not exceed the total number of months available in all renewal years combined. Automatic renewal of this Contract is prohibited.

Alternate Renewal Term – This contract may be renewed for _____ successive _____ year periods or shorter periods provided that they do not exceed the total number of months contained in all available renewals. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor and Agency.

Delivery Order Limitations: In the event that this contract permits delivery orders, a delivery order may only be issued during the time this Contract is in effect. Any delivery order issued within one year of the expiration of this Contract shall be effective for one year from the date the delivery order is issued. No delivery order may be extended beyond one year after this Contract has expired.

Fixed Period Contract: This Contract becomes effective upon Vendor's receipt of the notice to proceed and must be completed within _____ days.

Fixed Period Contract with Renewals: This Contract becomes effective upon Vendor's receipt of the notice to proceed and part of the Contract more fully described in the attached specifications must be completed within _____ days. Upon completion of the work covered by the preceding sentence, the vendor agrees that maintenance, monitoring, or warranty services will be provided for _____ year(s) thereafter.

One Time Purchase: The term of this Contract shall run from the issuance of the Award Document until all of the goods contracted for have been delivered, but in no event will this Contract extend for more than one fiscal year.

Other: See attached.

4. **NOTICE TO PROCEED:** Vendor shall begin performance of this Contract immediately upon receiving notice to proceed unless otherwise instructed by the Agency. Unless otherwise specified, the fully executed Award Document will be considered notice to proceed.

5. **QUANTITIES:** The quantities required under this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below.

Open End Contract: Quantities listed in this Solicitation are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually ordered for delivery during the term of the Contract, whether more or less than the quantities shown.

Service: The scope of the service to be provided will be more clearly defined in the specifications included herewith.

Combined Service and Goods: The scope of the service and deliverable goods to be provided will be more clearly defined in the specifications included herewith.

One Time Purchase: This Contract is for the purchase of a set quantity of goods that are identified in the specifications included herewith. Once those items have been delivered, no additional goods may be procured under this Contract without an appropriate change order approved by the Vendor, Agency, and Attorney General's office.

6. **REQUIRED DOCUMENTS:** All of the items checked below must be provided to the Agency by the Vendor as specified below.

PERFORMANCE BOND: The apparent successful Vendor shall provide a performance bond in the amount of 100% of the contract value. The performance bond must be received by the Agency prior to Contract award.

LABOR/MATERIAL PAYMENT BOND: The apparent successful Vendor shall provide a labor/material payment bond in the amount of 100% of the Contract value. The labor/material payment bond must be received by the Agency prior to Contract award.

MAINTENANCE BOND: The apparent successful Vendor shall provide a two (2) year maintenance bond covering the roofing system. The maintenance bond must be issued and delivered to the Agency prior to Contract award.

LICENSE(S) / CERTIFICATIONS / PERMITS: In addition to anything required under the Section of the General Terms and Conditions entitled Licensing, the apparent successful Vendor shall furnish proof of the following licenses, certifications, and/or permits upon request and in a form acceptable to the State. The request may be prior to or after contract award at the State's sole discretion.

<input type="checkbox"/>	

The apparent successful Vendor shall also furnish proof of any additional licenses or certifications contained in the specifications regardless of whether or not that requirement is listed above.

7. **INSURANCE:** The apparent successful Vendor shall furnish proof of the insurance identified by a checkmark below and must include the State as an additional insured on each policy prior to Contract award. The insurance coverages identified below must be maintained throughout the life of this contract. Thirty (30) days prior to the expiration of the insurance policies Vendor shall provide the Agency with proof that the insurance mandated herein has been continued. Vendor must also provide Agency with immediate notice of any changes in its insurance policies, including but not limited to, policy cancelation, policy reduction, or change in insurers. The apparent successful Vendor shall also furnish proof of any additional insurance requirements contained in the specifications prior to Contract award regardless of whether or not that insurance requirement is listed in this section.

Vendor must maintain:

Commercial General Liability Insurance in at least an amount of:
\$1,000,000.00 _____ per occurrence.

Automobile Liability Insurance in at least an amount of: \$1,000,000.00 _____ per occurrence.

Professional/Malpractice/Errors and Omission Insurance in at least an amount of: _____ per occurrence. Notwithstanding the forgoing, Vendor's are not required to list the State as an additional insured for this type of policy.

Commercial Crime and Third Party Fidelity Insurance in an amount of: _____ per occurrence.

Cyber Liability Insurance in an amount of: _____ per occurrence.

Builders Risk Insurance in an amount equal to 100% of the amount of the Contract.

Pollution Insurance in an amount of: _____ per occurrence.

Aircraft Liability in an amount of: _____ per occurrence.

8. **WORKERS' COMPENSATION INSURANCE:** The apparent successful Vendor shall comply with laws relating to workers compensation, shall maintain workers' compensation insurance when required, and shall furnish proof of workers' compensation insurance upon request.

9. **LIQUIDATED DAMAGES:** This clause shall in no way be considered exclusive and shall not limit the State or Agency’s right to pursue any other available remedy. Vendor shall pay liquidated damages in the amount specified below or as described in the specifications:

_____ for _____

Liquidated Damages Contained in the Specifications

10. **ACCEPTANCE:** Vendor’s signature on its bid, or on the certification and signature page, constitutes an offer to the State that cannot be unilaterally withdrawn, signifies that the product or service proposed by vendor meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise indicated, and signifies acceptance of the terms and conditions contained in the Solicitation unless otherwise indicated.

11. **PRICING:** The pricing set forth herein is firm for the life of the Contract, unless specified elsewhere within this Solicitation/Contract by the State. A Vendor’s inclusion of price adjustment provisions in its bid, without an express authorization from the State in the Solicitation to do so, may result in bid disqualification. Notwithstanding the foregoing, Vendor must extend any publicly advertised sale price to the State and invoice at the lower of the contract price or the publicly advertised sale price.

12. **PAYMENT IN ARREARS:** Payment in advance is prohibited under this Contract. Payment may only be made after the delivery and acceptance of goods or services. The Vendor shall submit invoices, in arrears.

13. **PAYMENT METHODS:** Vendor must accept payment by electronic funds transfer or P-Card. (The State of West Virginia’s Purchasing Card program, administered under contract by a banking institution, processes payment for goods and services through state designated credit cards.)

14. **ADDITIONAL FEES:** Vendor is not permitted to charge additional fees or assess additional charges that were not either expressly provided for in the solicitation published by the State of West Virginia or included in the unit price or lump sum bid amount that Vendor is required by the solicitation to provide. Including such fees or charges as notes to the solicitation may result in rejection of vendor’s bid. Requesting such fees or charges be paid after the contract has been awarded may result in cancellation of the contract.

15. **TAXES:** The Vendor shall pay any applicable sales, use, personal property or any other taxes arising out of this Contract and the transactions contemplated thereby. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

16. **FUNDING:** This Contract shall continue for the term stated herein, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise made available, this Contract becomes void and of no effect beginning on July 1 of the fiscal year for which funding has not been appropriated or otherwise made available.

17. CANCELLATION: The State reserves the right to cancel this Contract immediately upon written notice to the vendor if the materials or workmanship supplied do not conform to the specifications contained in the Contract. The Agency may also cancel any purchase or Contract upon 30 days written notice to the Vendor.

18. TIME: Time is of the essence with regard to all matters of time and performance in this Contract.

19. APPLICABLE LAW: This Contract is governed by and interpreted under West Virginia law without giving effect to its choice of law principles. Any information provided in specification manuals, or any other source, verbal or written, which contradicts or violates the West Virginia Constitution, West Virginia Code or West Virginia Code of State Rules is void and of no effect.

20. COMPLIANCE WITH LAWS: Vendor shall comply with all applicable federal, state, and local laws, regulations and ordinances. By submitting a bid, Vendor acknowledges that it has reviewed, understands, and will comply with all applicable laws, regulations, and ordinances. Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to comply with all applicable laws, regulations, and ordinances.

21. ARBITRATION: Any references made to arbitration contained in this Contract, Vendor's bid, or in any American Institute of Architects documents pertaining to this Contract are hereby deleted, void, and of no effect.

22. MODIFICATIONS: This writing is the parties' final expression of intent. Notwithstanding anything contained in this Contract to the contrary, no modification of this Contract shall be binding without mutual written consent of the Agency, and the Vendor.

23. WAIVER: The failure of either party to insist upon a strict performance of any of the terms or provision of this Contract, or to exercise any option, right, or remedy herein contained, shall not be construed as a waiver or a relinquishment for the future of such term, provision, option, right, or remedy, but the same shall continue in full force and effect. Any waiver must be expressly stated in writing and signed by the waiving party.

24. SUBSEQUENT FORMS: The terms and conditions contained in this Contract shall supersede any and all subsequent terms and conditions which may appear on any form documents submitted by Vendor to the Agency such as price lists, order forms, invoices, sales agreements, or maintenance agreements, and includes internet websites or other electronic documents. Acceptance or use of Vendor's forms does not constitute acceptance of the terms and conditions contained thereon.

25. ASSIGNMENT: Neither this Contract nor any monies due, or to become due hereunder, may be assigned by the Vendor without the express written consent of the Agency and any other government agency or office that may be required to approve such assignments.

26. WARRANTY: The Vendor expressly warrants that the goods and/or services covered by this Contract will: (a) conform to the specifications, drawings, samples, or other description furnished or specified by the Agency; (b) be merchantable and fit for the purpose intended; and (c) be free from defect in material and workmanship.

27. STATE EMPLOYEES: State employees are not permitted to utilize this Contract for personal use and the Vendor is prohibited from permitting or facilitating the same.

28. PRIVACY, SECURITY, AND CONFIDENTIALITY: The Vendor agrees that it will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the Agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the Agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/default.html>

29. YOUR SUBMISSION IS A PUBLIC DOCUMENT: Vendor's entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, as required by the competitive bidding laws of the State of West Virginia and the Freedom of Information Act West Virginia Code § 29B-1-1 et seq.

DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Agency constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Agency will disclose any document labeled "confidential," "proprietary," "trade secret," "private," or labeled with any other claim against public disclosure of the documents, to include any "trade secrets" as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

30. LICENSING: In accordance with applicable law, Vendor must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agency or political subdivision. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Upon request, the Vendor must provide all necessary releases to obtain information to enable the Agency to verify that the Vendor is licensed and in good standing with the above entities. Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to be licensed, in good standing, and up-to-date on all state and local obligations as described in this section.

31. ANTITRUST: In submitting a bid to, signing a contract with, or accepting an Award Document from any agency of the State of West Virginia, the Vendor agrees to convey, sell, assign, or transfer to the State of West Virginia all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to Vendor.

32. VENDOR CERTIFICATIONS: By signing its bid or entering into this Contract, Vendor certifies (1) that its bid or offer was made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, person or entity submitting a bid or offer for the same material, supplies, equipment or services; (2) that its bid or offer is in all respects fair and without collusion or fraud; (3) that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; and (4) that it has reviewed this Solicitation in its entirety; understands the requirements, terms and conditions, and other information contained herein. Vendor's signature on its bid or offer also affirms that neither it nor its representatives have any interest, nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency. The individual signing this bid or offer on behalf of Vendor certifies that he or she is authorized by the Vendor to execute this bid or offer or any documents related thereto on

Vendor's behalf; that he or she is authorized to bind the Vendor in a contractual relationship; and that, to the best of his or her knowledge, the Vendor has properly registered with any State agency that may require registration.

33. VENDOR RELATIONSHIP: The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this Contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents. Vendor shall be responsible for selecting, supervising, and compensating any and all individuals employed pursuant to the terms of this Solicitation and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever. Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, etc. and the filing of all necessary documents, forms, and returns pertinent to all of the foregoing. Vendor shall hold harmless the State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

34. INDEMNIFICATION: The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the Contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the Contract in a manner not authorized by the Contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage and hour laws.

35. PURCHASING AFFIDAVIT: In accordance with West Virginia Code, the State is prohibited from awarding a contract to any bidder that owes a debt to the State or a political subdivision of the State, Vendors are required to sign, notarize, and submit the Purchasing Affidavit to the Agency affirming under oath that it is not in default on any monetary obligation owed to the state or a political subdivision of the state.

36. CONFLICT OF INTEREST: Vendor, its officers or members or employees, shall not presently have or acquire an interest, direct or indirect, which would conflict with or compromise the performance of its obligations hereunder. Vendor shall periodically inquire of its officers, members and employees to ensure that a conflict of interest does not arise. Any conflict of interest discovered shall be promptly presented in detail to the Agency.

37. REPORTS: Vendor shall provide the Agency with the following reports identified by a checked box below:

Such reports as the Agency may request. Requested reports may include, but are not limited to, quantities purchased, agencies utilizing the contract, total contract expenditures by agency, etc.

Quarterly reports detailing the total quantity of purchases in units and dollars, along with a listing of purchases by agency. Quarterly reports should be delivered to the Agency.

38. BACKGROUND CHECK: In accordance with W. Va. Code § 15-2D-3, the Director of the Division of Protective Services shall require any service provider whose employees are regularly employed on the grounds or in the buildings of the Capitol complex or who have access to sensitive or critical information to submit to a fingerprint-based state and federal background inquiry through the state repository. The service provider is responsible for any costs associated with the fingerprint-based state and federal background inquiry. After the contract for such services has been approved, but before any such employees are permitted to be on the grounds or in the buildings of the Capitol complex or have access to sensitive or critical information, the service provider shall submit a list of all persons who will be physically present and working at the Capitol complex to the Director of the Division of Protective Services for purposes of verifying compliance with this provision. The State reserves the right to prohibit a service provider's employees from accessing sensitive or critical information or to be present at the Capitol complex based upon results addressed from a criminal background check.

Service providers should contact the West Virginia Division of Protective Services by phone at (304) 558-9911 for more information.

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

Ben Zuniga, Bid Contracts Manager I

(Name, Title)

(Printed Name and Title)

655 Lone Oak Drive, Building 3, Eagan MN 55121

(Address)

651-795-4378 / 651-306-5429

(Phone Number) / (Fax Number)

benjamin.zuniga@ecolab.com

(E-mail address)

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Ecolab Inc.

(Company)



Bid Contracts Manager I

(Authorized Signature) (Representative Name, Title)

Ben Zuniga, Bid Contracts Manager I

(Printed Name and Title of Authorized Representative)

8/2/2023

(Date)

651-795-4378 / 651-306-5429

(Phone Number) (Fax Number)

ADDENDUM ACKNOWLEDGEMENT FORM

SOLICITATION NO.:

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification. Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

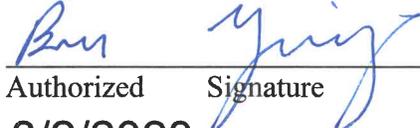
Addendum Numbers Received:
(Check the box next to each addendum received)

- | | |
|---|--|
| <input type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Ecolab Inc.

Company



Authorized

Signature

8/2/2023

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.



**State of West Virginia
DRUG FREE WORKPLACE CONFORMANCE AFFIDAVIT
West Virginia Code §21-1D-5**

STATE OF ~~WEST VIRGINIA~~, MINNESOTA

COUNTY OF Dakota, TO-WIT:

I, Ben Zuniga, after being first duly sworn, depose and state as follows:

- 1. I am an employee of Ecolab Inc.; and,
(Company Name)
- 2. I do hereby attest that Ecolab Inc.
(Company Name)

maintains a written plan for a drug-free workplace policy and that such plan and policy are in compliance with **West Virginia Code §21-1D**.

The above statements are sworn to under the penalty of perjury.

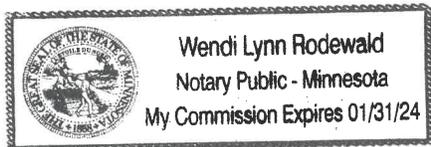
Printed Name: Ben Zuniga
 Signature: *Ben Zuniga*
 Title: Bid Contracts Manager I
 Company Name: Ecolab Inc.
 Date: 8/2/2023

Taken, subscribed and sworn to before me this 2nd day of August, 2023.

By Commission expires 1/31/2024

(Seal)

Wendi Lynn Rodewald
 (Notary Public)



STATE OF WEST VIRGINIA
PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: Under W. Va. Code §15A-3-14, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Ecolab Inc.

Authorized Signature: *Ben Guiz* Date: 8/2/2023

State of Minnesota

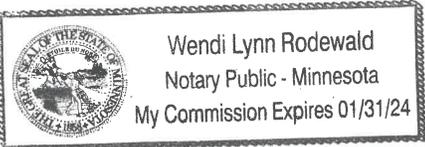
County of Dakota, to-wit:

Taken, subscribed, and sworn to before me this 2nd day of August, 2023.

My Commission expires 1/31/2024, 20 .

AFFIX SEAL HERE

NOTARY PUBLIC *Wendi Lynn Rodewald*



Request for Taxpayer Identification Number and Certification

**Give Form to the
requester. Do not
send to the IRS.**

▶ Go to www.irs.gov/FormW9 for instructions and the latest information.

Print or type. See Specific Instructions on page 3.	1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank. Ecolab Inc.		
	2 Business name/disregarded entity name, if different from above		
	3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.		4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) <u>5</u> Exemption from FATCA reporting code (if any) <u>D</u> <small>(Applies to accounts maintained outside the U.S.)</small>
	<input type="checkbox"/> Individual/sole proprietor or single-member LLC <input checked="" type="checkbox"/> C Corporation <input type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate		
	<input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____ Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.		
	<input type="checkbox"/> Other (see instructions) ▶ _____		
	5 Address (number, street, and apt. or suite no.) See instructions. 1 Ecolab Place (Corporate Headquarters Address)		Requester's name and address (optional)
6 City, state, and ZIP code St. Paul, MN 55102			
7 List account number(s) here (optional)			

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number									
or									
Employer identification number									
4	1		-	0	2	3	1	5	1

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here	Signature of U.S. person ▶	Date ▶ January 1, 2023
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General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.

[Click here](#) for a printer-friendly version of this document.

MEMORANDUM OF INSURANCE	DATE 14-Dec-2022
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This Memorandum is issued as a matter of information only to authorized viewers for their internal use only and confers no rights upon any viewer of this Memorandum. This Memorandum does not amend, extend or alter the coverage described below. This Memorandum may only be copied, printed and distributed within an authorized viewer and may only be used and viewed by an authorized viewer for its internal use. Any other use, duplication or distribution of this Memorandum without the consent of Marsh is prohibited. "Authorized viewer" shall mean an entity or person which is authorized by the insured named herein to access this Memorandum via <https://marshdigital.marsh.com/marshconnect/viewMOI.action?clientId=894>. The information contained herein is as of the date referred to above. Marsh shall be under no obligation to update such information.

PRODUCER Marsh USA Inc. ("Marsh")	COMPANIES AFFORDING COVERAGE
	Co. A National Union Fire Ins Co of Pittsburgh PA
INSURED Ecolab Inc., Nalco Company LLC 1 Ecolab Place St. Paul Minnesota 55102 United States	Co. B AIU Insurance Company
	Co. C New Hampshire Ins. Co.
	Co. D American International Group UK Ltd
	Co. E American Home Assurance Company
	Co. F

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS MEMORANDUM MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE	POLICY EXPIRATION DATE	LIMITS LIMITS IN USD UNLESS OTHERWISE INDICATED	
A	GENERAL LIABILITY Commercial General Liability Occurrence	3980263	31-Dec-2022	01-Dec-2023	GENERAL AGGREGATE	USD 5,000,000
A		3980264 (Products)	31-Dec-2022	01-Dec-2023	PRODUCTS - COMP/OP AGG	USD 15,000,000
					PERSONAL AND ADV INJURY	USD 2,000,000
					EACH OCCURRENCE	USD 2,000,000 Prem / USD 5,000,000 Products
					FIRE DAMAGE (ANY ONE FIRE)	USD 500,000
					MED EXP (ANY ONE PERSON)	
A	AUTOMOBILE LIABILITY Any Auto	4888773 (AOS)	31-Dec-2022	01-Dec-2023	COMBINED SINGLE LIMIT	USD 5,000,000
A		4888775 (MA)	31-Dec-2022	01-Dec-2023	BODILY INJURY (PER PERSON)	
A		4888774 (VA)	31-Dec-2022	01-Dec-2023	BODILY INJURY (PER ACCIDENT)	
					PROPERTY DAMAGE	
D	EXCESS LIABILITY Umbrella Form	62785848	31-Dec-2022	01-Dec-2023	EACH OCCURENCE	USD 10,000,000
					AGGREGATE	UDS 10,000,000
B	WORKERS COMPENSATION / EMPLOYERS LIABILITY THE PROPRIETOR / PARTNERS / EXECUTIVE OFFICERS ARE Included	WC080880467 (AOS) (incl Stop Gap ND, WA, WY)	31-Dec-2022	01-Dec-2023	WORKERS COMP LIMITS	Statutory
B		WC080880468 (CA)	31-Dec-2022	01-Dec-2023	EL EACH ACCIDENT	USD 2,000,000
B		WC080880466 (WI)	31-Dec-2022	01-Dec-2023	EL DISEASE - POLICY LIMIT	USD 2,000,000
					EL DISEASE - EACH EMPLOYEE	USD 2,000,000
A	Excess Workers Compensation	XWC1647370 (OH)	31-Dec-2022	01-Dec-2023	WC Statutory Limits;	EL 1M/1M Excess of 1M SIR

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The Memorandum of Insurance serves solely to list insurance policies, limits and dates of coverage. Any modifications hereto are not authorized.

MEMORANDUM OF INSURANCE	DATE 14-Dec-2022
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This Memorandum is issued as a matter of information only to authorized viewers for their internal use only and confers no rights upon any viewer of this Memorandum. This Memorandum does not amend, extend or alter the coverage described below. This Memorandum may only be copied, printed and distributed within an authorized viewer and may only be used and viewed by an authorized viewer for its internal use. Any other use, duplication or distribution of this Memorandum without the consent of Marsh is prohibited. "Authorized viewer" shall mean an entity or person which is authorized by the insured named herein to access this Memorandum via <https://marshdigital.marsh.com/marshconnect/viewMOI.action?clientId=894>. The information contained herein is as of the date referred to above. Marsh shall be under no obligation to update such information.

PRODUCER Marsh USA Inc. ("Marsh")	INSURED Ecolab Inc., Nalco Company LLC 1 Ecolab Place St. Paul Minnesota 55102 United States
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ADDITIONAL INFORMATION

Any person or organization are included as additional insured on the auto liability and general/product liability policies, where required by written contract executed prior to loss. Refer to the attached page "Additional Remarks Schedule" for the applicable additional insured, insurance as primary, waiver of subrogation, notice of cancellation and other endorsements that may apply, where required by written contract. All endorsements are issued on a blanket basis without having to specifically name individual customers or others on an endorsement.

Ecolab Inc.
December 31, 2022 - December 01, 2023
Certificate Description of Operations Language

Named Insured: coverage under the policies shown above apply to Ecolab Inc., its subsidiaries, and business units including but not limited to the following:

Ecolab Inc.
1 Ecolab Place
St. Paul, MN 55102

- Bioquell Inc.
- Chemstar Corporation
- Ecolab Production LLC
- Ecolab USA
- EcoSure
- Ecovation, Inc.
- Food Protection Services LLC
- Food Safety Specialists, Inc.
- FPS Region 3 LLC
- Kay Chemical
- Lobster Ink US, Inc
- Microtek Medical, Inc.
- Pest Elimination
- Research Fumigation Co., LLC
- Royal Pest Solutions, Inc.
- Swisher
- Purolite LLC

Nalco Company LLC
1601 West Diehl Road
Naperville, IL 60563

Abednego Environmental Services, LLC

Cascade Water
ChemStaff
Nalco Industrial Outsourcing
Nalco Production LLC
Nalco U.S. 2 LLC
Nalco Water
Nalco Water Pretreatment Solutions, LLC
Quantum Technical Services, LLC

Additional Insured: Where required by written contract executed prior to loss, the certificate holder and any person or organization are included as additional insured on the auto liability and general liability policies. The following endorsements are attached to the policies shown above:

General Liability (Premises/Ongoing Operations) and General Liability (Products/Completed Operations)
Additional Insured-Vendors CG2015
Additional Insured-Primary Insurance 74434 (Premises/Ongoing Operations); 94955 (Products/Completed Operations)
General Liability (Premises/Ongoing Operations)
Additional Insured-Owners, Lessees or Contractors-Scheduled Person or Organization CG2010
Additional Insured-Managers or Lessors of Premises CG2011
Additional Insured-State of Governmental Agency or Subdivision or Political Subdivision-Permits or Authorizations CG2012
Additional Insured-Designated Person or Organization CG 20 26
Additional Insured-Lessor of Leased Equipment Automatic Coverage CG2034
Additional Insured-Owners, Lessees or Contractors-Automatic Status When Requirement in Construction Agreement with You CG2033
Additional Insured-Owners, Lessees or Contractors-Automatic Status for Other Parties When Required in Writing Construction Agreement CG2038

General Liability (Products/Completed Operations)
Additional Insured-Where Required Under Contract or Agreement 94954
Additional Insured-Owners, Lessees or Contractors-Completed Operations CG2037

Automobile Liability
Additional Insured-Where Required Under Contract or Agreement 87950
Lessor-Additional Insured and Loss Payee CA2001
Insurance Primary as to Certain Additional Insureds 74445

Waiver of Subrogation: Where required by written contract executed prior to loss, waiver of subrogation is granted on the auto liability, general liability and workers compensation and umbrella liability policies. The following endorsements are attached to the policies shown above:

General Liability (Premises/Ongoing Operations) and General Liability (Products/Completed Operations): Waiver of Transfer of Rights of Recovery Against Others to Us CG2404
Automobile Liability: Waiver of Transfer of Rights of Recovery Against Others to Us 62897
Workers Compensation & Employers Liability: Waiver of Our Right to Recover from Others WC000313

Notice of Cancellation: The following endorsements are attached to the policies shown above:

General Liability (Premises/Ongoing Operations), General Liability (Products/Completed Operations) and Automobile Liability: Limited Advice of Cancellation to Scheduled Entities 108538
Workers Compensation & Employers Liability: Limited Advice of Cancellation Provided Via Email to Entities Other Than the Named Insured 108538

Pesticide or Herbicide Applicator Coverage CG2264 is attached to the general liability (premises) liability policy shown above

Blended Pollution Endorsement is attached to the general liability (premises) policy shown above

Waiver of Governmental Immunity Endorsement CG2414 is attached to the general liability (premises) policy shown above

Alternate Employer Endorsement WC000301, WC000301A are attached to the workers compensation policies shown above

Longshore and Harbor Workers Compensation Act Coverage Endorsement WC000106A is attached to the workers

compensation policies shown above

Maritime Coverage Endorsement WC000201B (Jones Act) is attached to the workers compensation policies shown above.

Outer Continental Shelf Lands Act Coverage Endorsement WC000109C is attached to the workers compensation policies shown above.

Umbrella policy territory is WORLDWIDE. Coverage applies excess of retained amounts. This retained limit can be satisfied either through insurance of paid by Ecolab.

Limits shown are in US Dollars (USD)

The insurance evidenced herein and in the referenced policies is not intended to provide coverage beyond that required by written contract, beyond the Named Insured's indemnification obligations or at law.

The Memorandum of Insurance serves solely to list insurance policies, limits and dates of coverage. Any modifications hereto are not authorized.

[Click here](#) for a printer-friendly version of this document.



Ecolab Standard Indemnification Coverage

With regard to third party claims, Ecolab will defend, indemnify and hold Customer harmless from and against any liability, including reasonable attorneys' fees and court costs, relating to bodily injury, death or property damage, but only to the proportionate extent that such injury, death or property damage is caused by (i) Ecolab's breach of its warranties or (ii) Ecolab's (or its employees' or agents') negligent or intentionally wrongful acts or omissions. Customer must give Ecolab prompt written notice of any claim for which Customer intends to seek recovery from Ecolab under this Agreement. If Ecolab accepts tender for indemnity hereunder, Customer may not settle, defend or litigate any claim for which Customer seeks or will seek indemnification from Ecolab without the prior written consent of Ecolab, and Ecolab will not be liable for any settlement or claim established against, or cost or expense incurred by, Customer without that prior written consent.



SECTION 1: SPECIFICATION INFORMATION

ALL MODELS SPECIFICATIONS, VENTILATION & ELECTRICAL REQUIREMENTS

RACKS PER HOUR:

ALL MODELS 244

CAPACITIES:

EC-44/EC-44 HH WASH TANK (GALLONS) 20
 EC-44/EC-44 HH WASH PUMP (GPM) 270
 EC-66/EC-66 HH WASH TANK (GALLONS) 20
 EC-66/EC-66 HH WASH PUMP (GPM) 270
 EC-66/EC-66 HH PREWASH TANK (GALLONS) 16
 EC-66/EC-66 HH PREWASH PUMP (GPM) 120

CONVEYOR SPEED:

All Models 6.8 FPM

GALLONS PER RACK:

All Models 0.91

WATER REQUIREMENTS (ALL MODELS):

WASH TEMPERATURE (hot water sanitizing) 160°F
 WASH TEMPERATURE (chemical sanitizing) 140°F
 RINSE TEMPERATURE (hot water sanitizing) 180°F
 RINSE TEMPERATURE (chemical sanitizing) 120°F
 FLOW PRESSURE (PSI) 20±5
 FLOWRATE (GPM) 3.72

NOTE: Temperatures listed are minimums.

SANITIZER REQUIREMENTS:

All Models in Chemical Sanitizing Mode 50PPM

VENTING REQUIREMENTS (all models):

INPUT END (CFM) 200
 OUTPUT END (CFM) 400
 TOTAL (CFM) 600

NOTE: For ventilation systems that connect directly to the conveyor, it is recommended to use baffled ventilation scoops to allow better control of the airflow out of the machine as well as a timing circuit for the exhaust fan to minimize the amount of time the fan runs with an idle dishmachine. Parts information for ventilation scoops and the exhaust fan timer kit can be found in this manual.

MOTOR ELECTRICAL REQUIREMENTS:

DRIVE MOTOR HP 1/4
 PREWASH MOTOR HP (EC66/EC66 HH ONLY) 1
 WASH MOTOR HP 2

NOTE: Typical Electrical Circuit is based upon (1) full amperage load of the machine plus 25% of the wash pump amperage load and (2) typical fixed-trip circuit breaker sizes as listed in the NEC 2008 Edition. Local codes may require more stringent protection than what is displayed here. Always verify with your electrical service contractor that your circuit protection is adequate and meets all applicable national and local codes. These numbers are provided in this manual simply for reference and may change without notice at any given time.

EC-44/EC-44HH ELECTRICAL REQUIREMENTS:

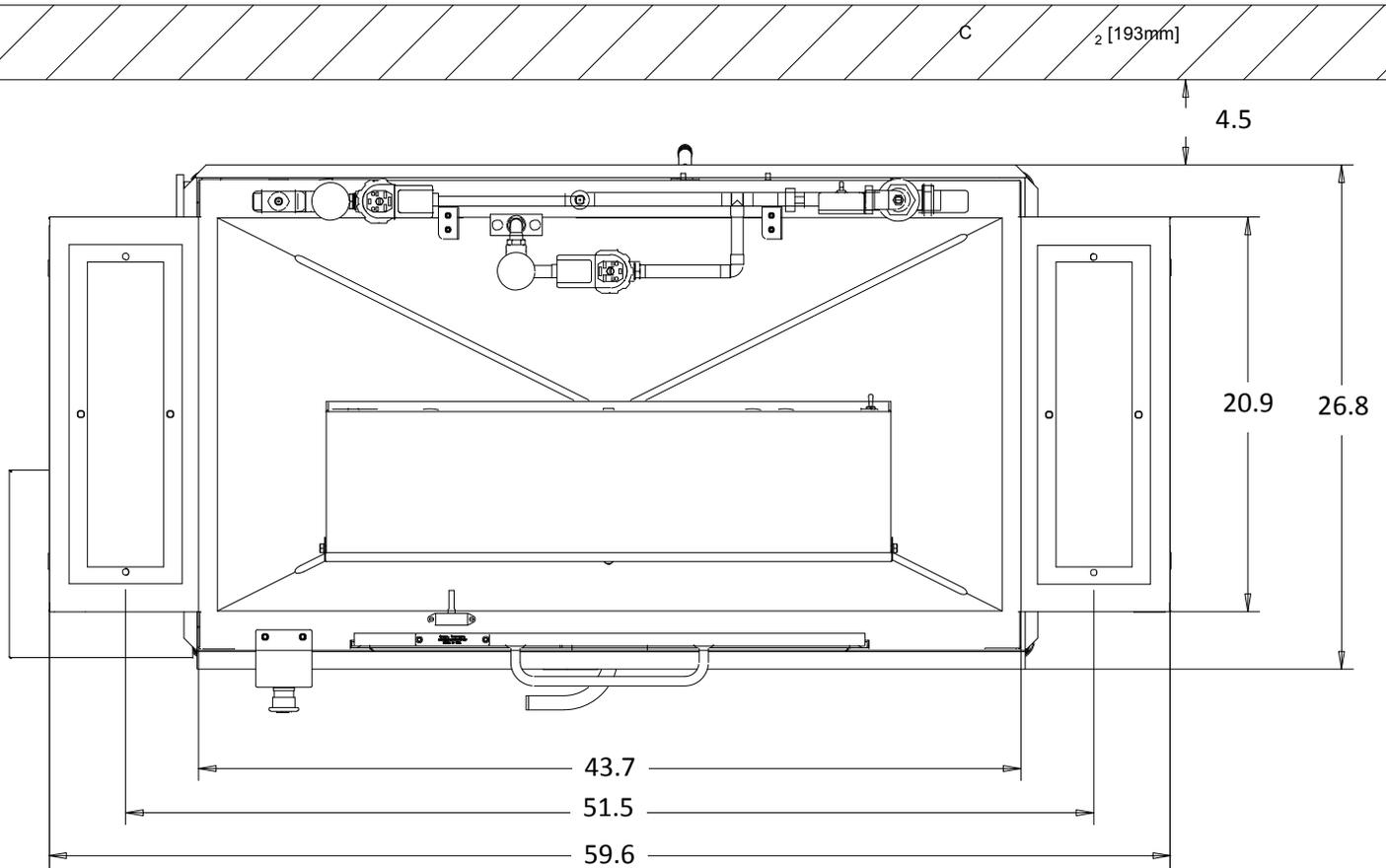
VOLTS	PH	HZ	WASH HEATER RATINGS	TOTAL AMPS	TYPICAL ELECTRICAL CIRCUIT
208V	1	60	15KW@208V	82.65 A	90 AMP
230V	1	60	15KW@230V	75.85 A	80 AMP
208V	3	60	15KW@208V	48.75 A	60 AMP
230V	3	60	15KW@230V	44.6 A	50 AMP
460V	3	60	15KW@460V	22.3 A	25 AMP

EC-66/EC-66 HH ELECTRICAL REQUIREMENTS:

VOLTS	PH	HZ	WASH HEATER RATINGS	TOTAL AMPS	TYPICAL ELECTRICAL CIRCUIT
208V	1	60	15KW@208V	88.65 A	100 AMP
230V	1	60	15KW@230V	81.85 A	90 AMP
208V	3	60	15KW@208V	52.15 A	60 AMP
230V	3	60	15KW@230V	48.0 A	60 AMP
460V	3	60	15KW@460V	24.1 A	30 AMP

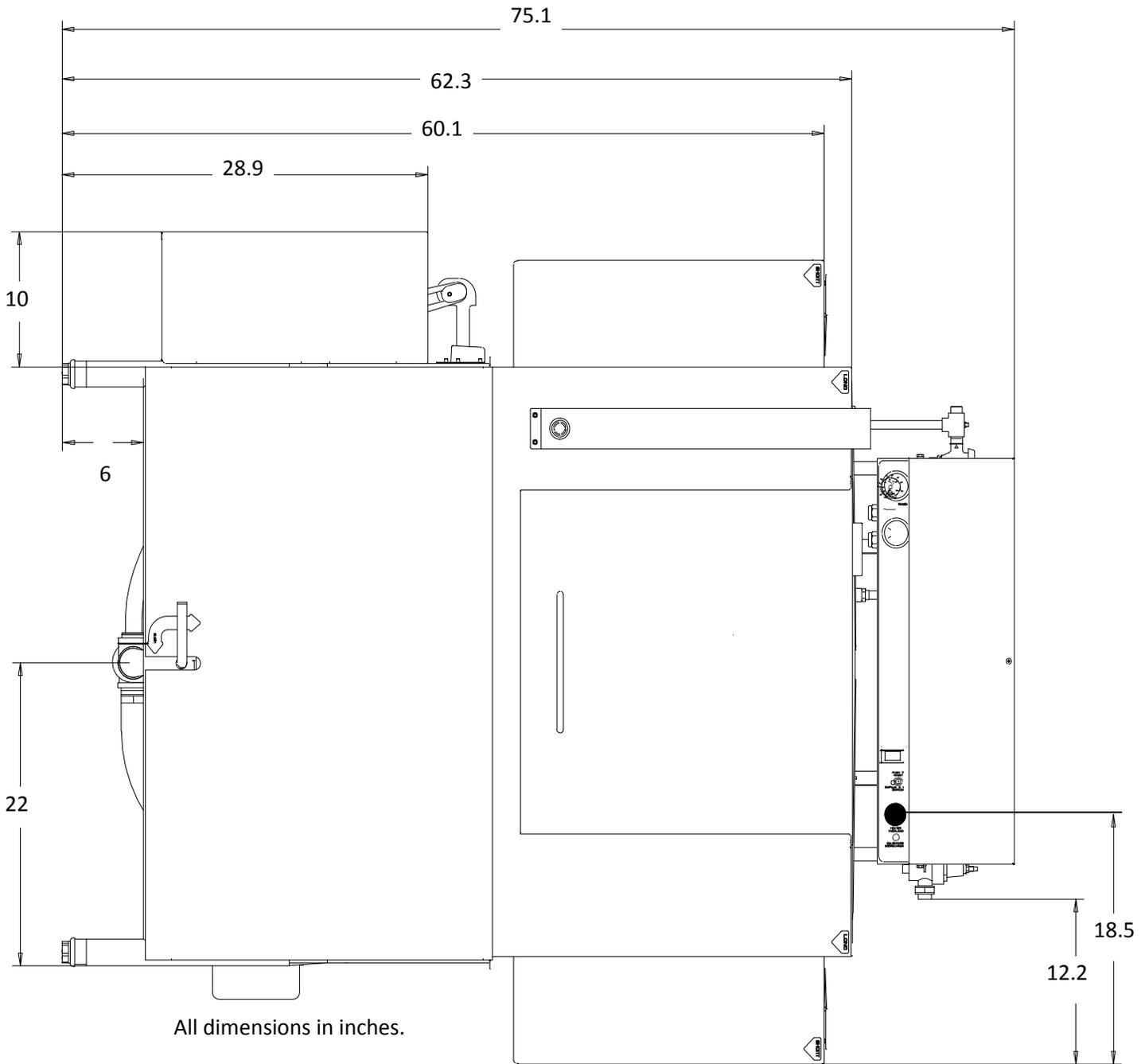
NOTE: Always refer to the machine data plate for specific electrical and water requirements. The material provided on this page is for reference only and may be subject to change without notice.

SECTION 1: SPECIFICATION INFORMATION
EC-44HH (RIGHT TO LEFT) DIMENSIONS, TOP

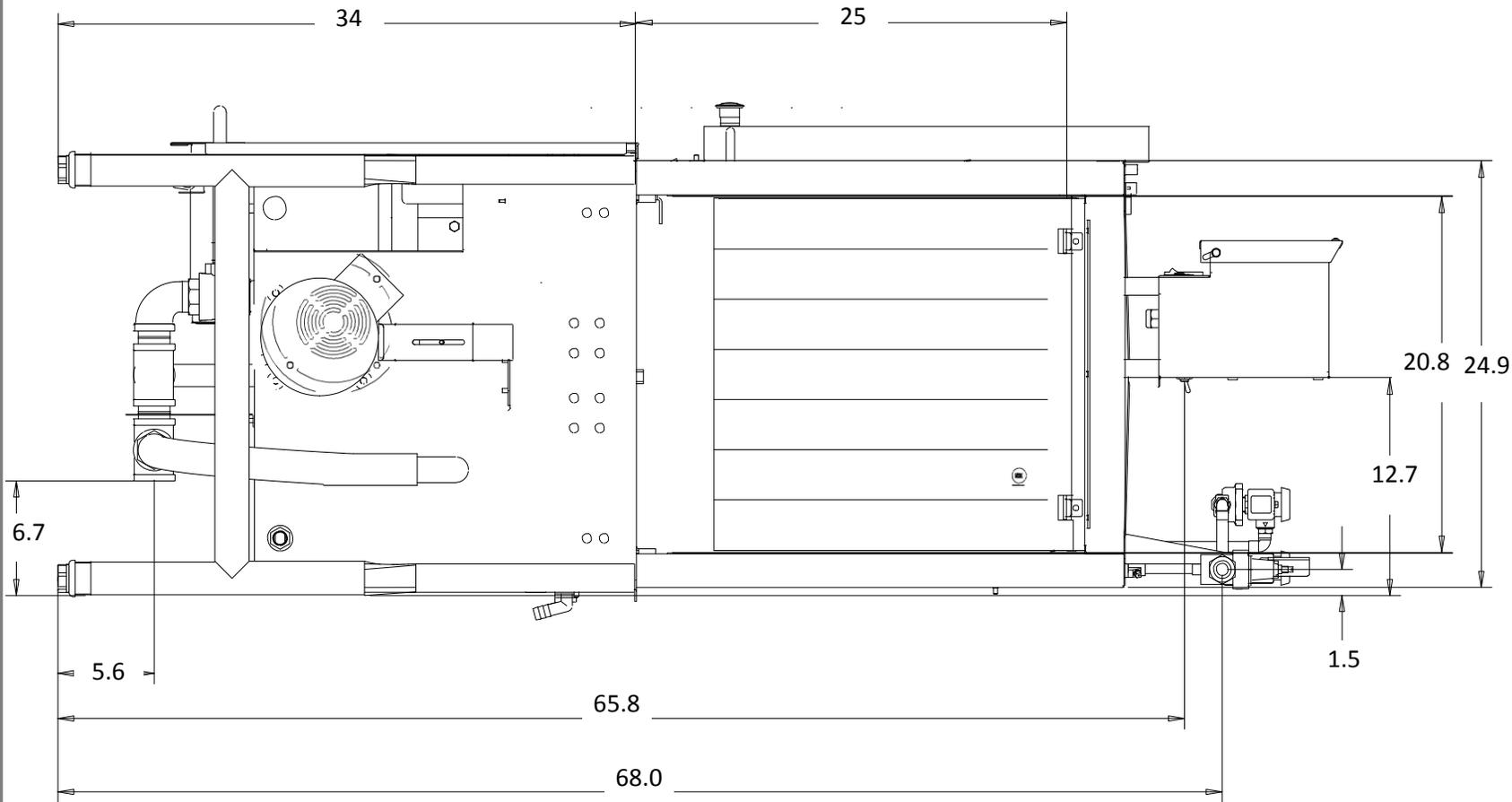


All dimensions in inches.

SECTION 1: SPECIFICATION INFORMATION
EC-44HH (RIGHT TO LEFT) DIMENSIONS, FRONT

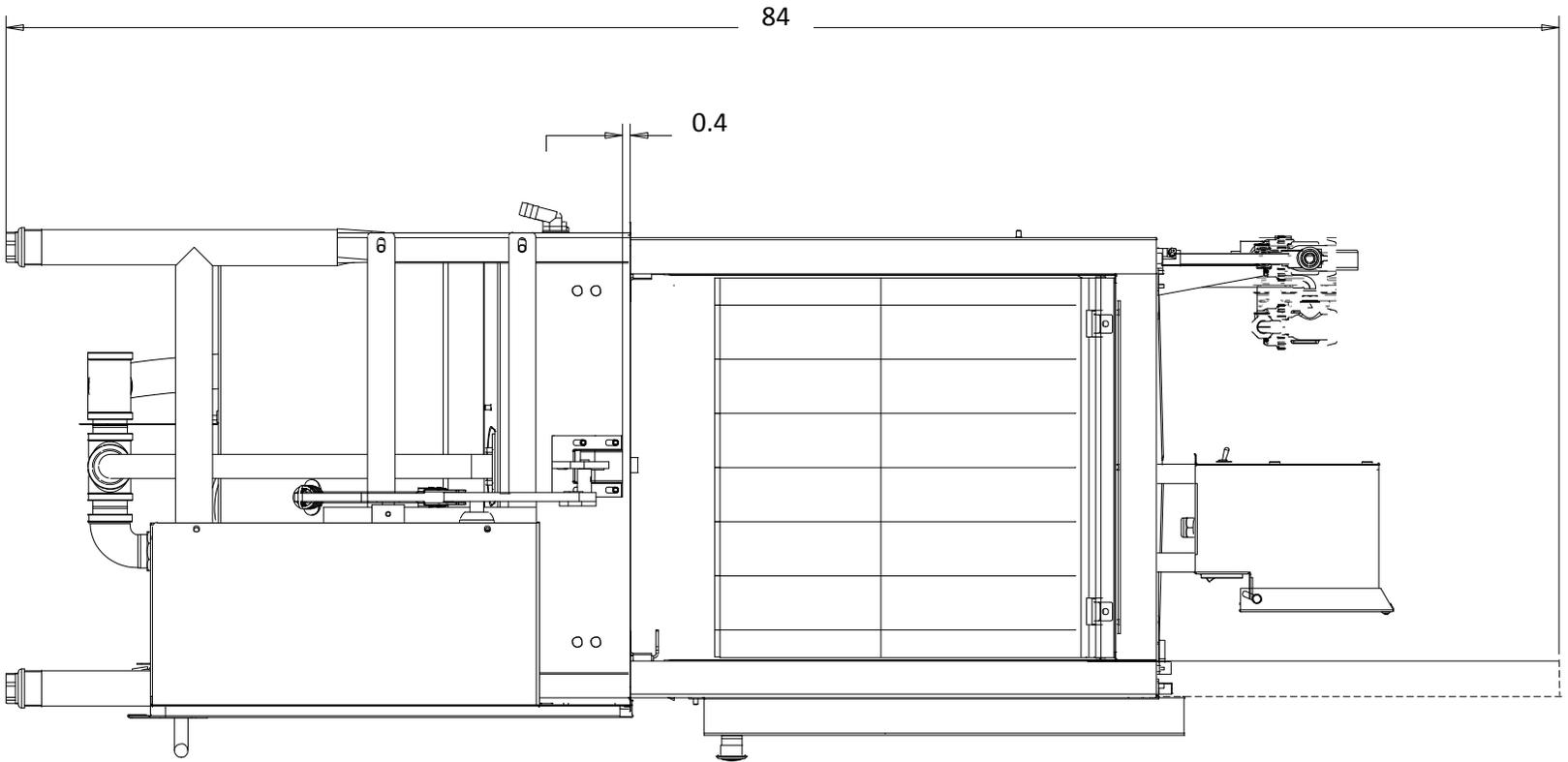


SECTION 1: SPECIFICATION INFORMATION
EC-44HH (RIGHT TO LEFT) DIMENSIONS, RIGHT SIDE



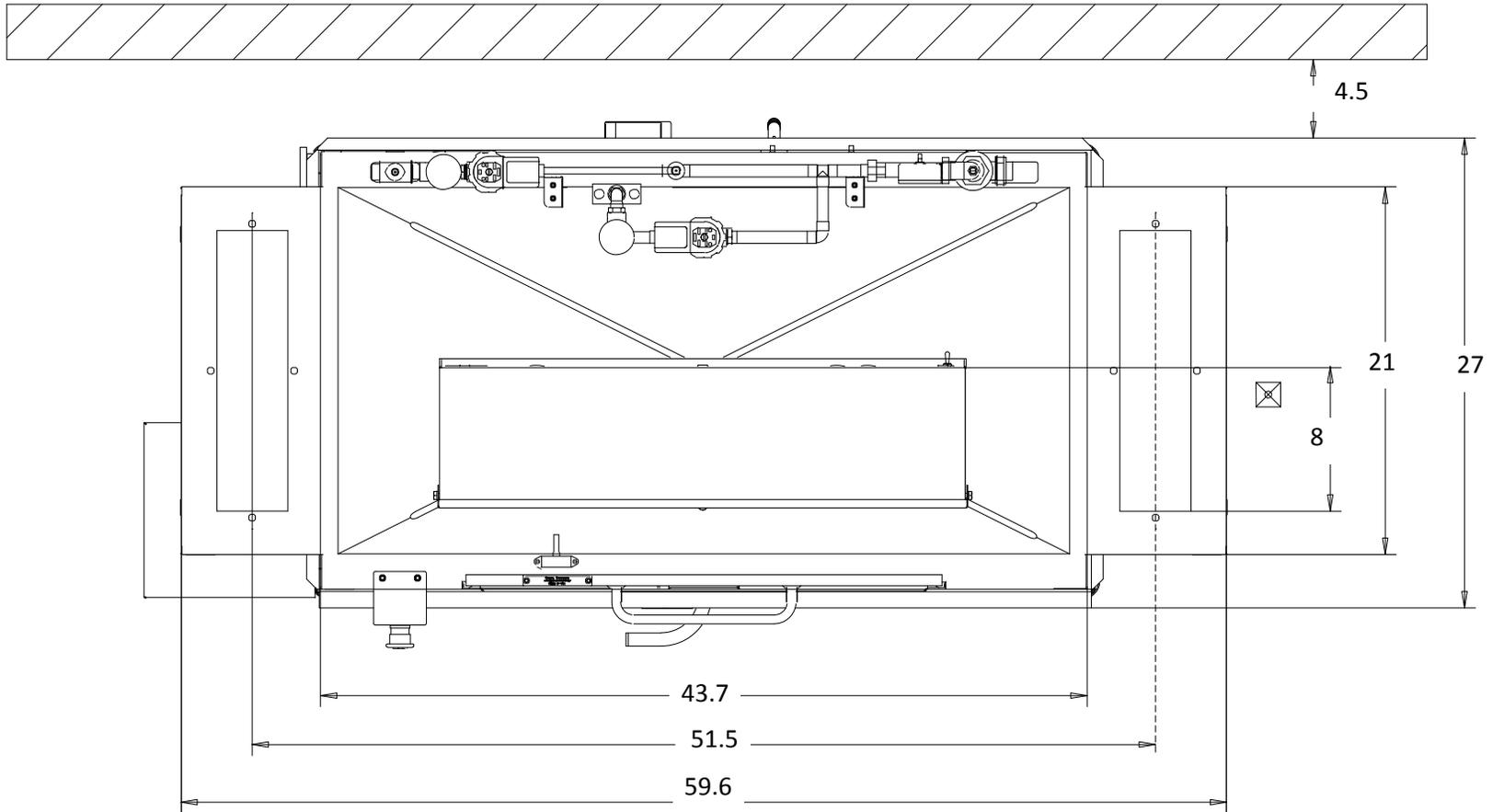
All dimensions in inches.

SECTION 1: SPECIFICATION INFORMATION
EC-44HH (RIGHT TO LEFT) DIMENSIONS, LEFT SIDE



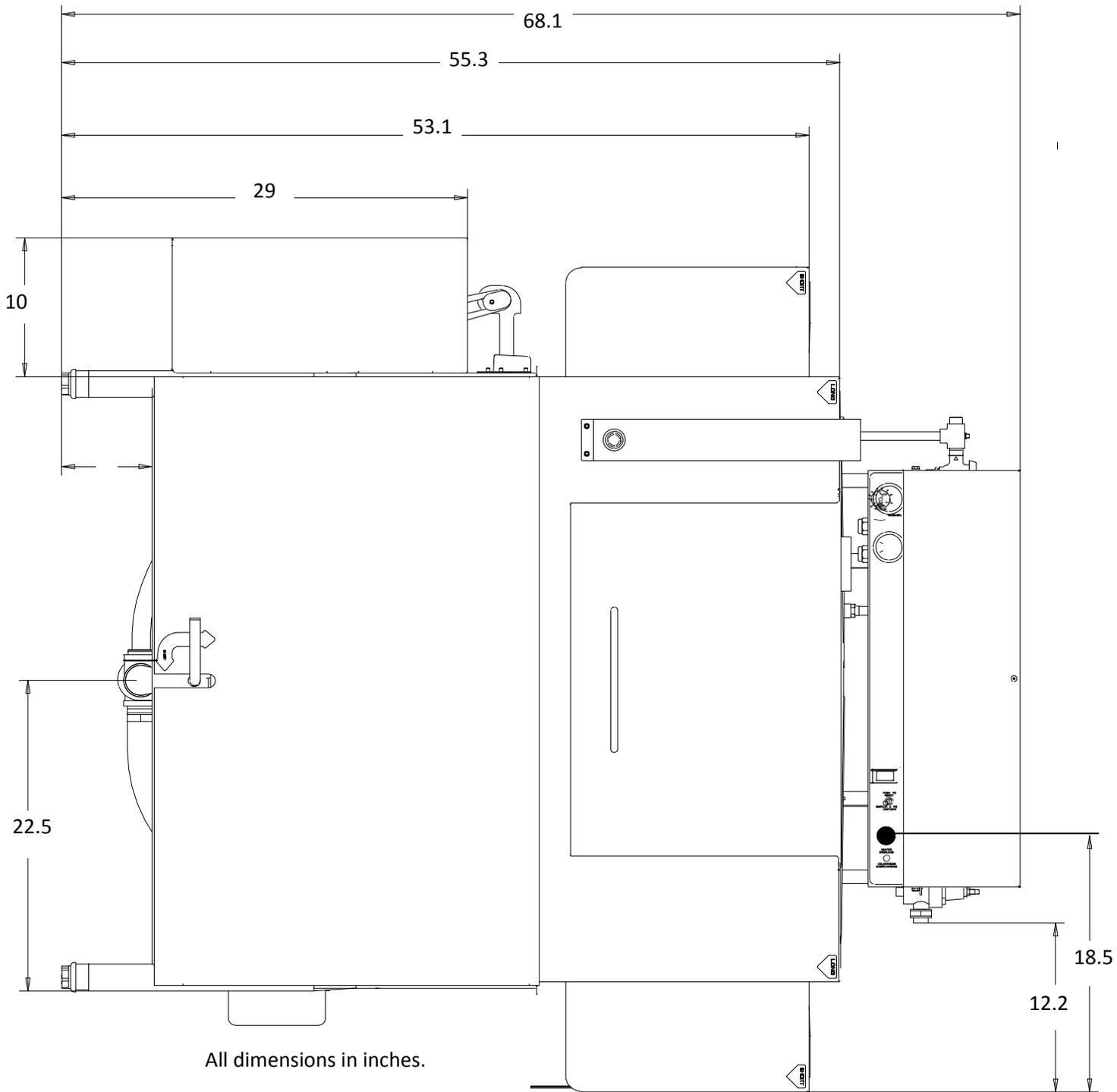
All dimensions in inches.

SECTION 1: SPECIFICATION INFORMATION
EC-44 (RIGHT TO LEFT) DIMENSIONS, TOP

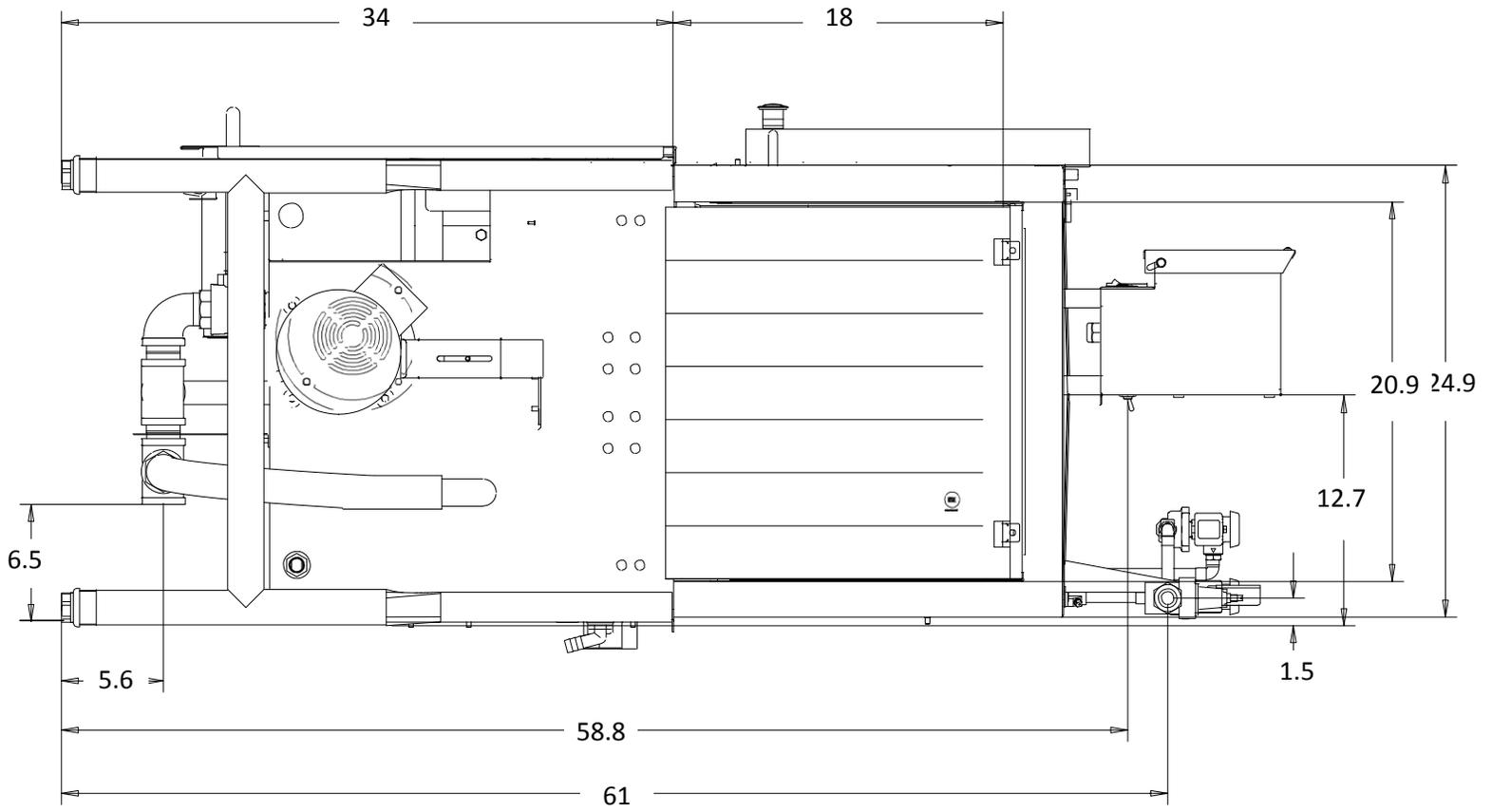


All dimensions in inches.

SECTION 1: SPECIFICATION INFORMATION
EC-44 (RIGHT TO LEFT) DIMENSIONS, FRONT

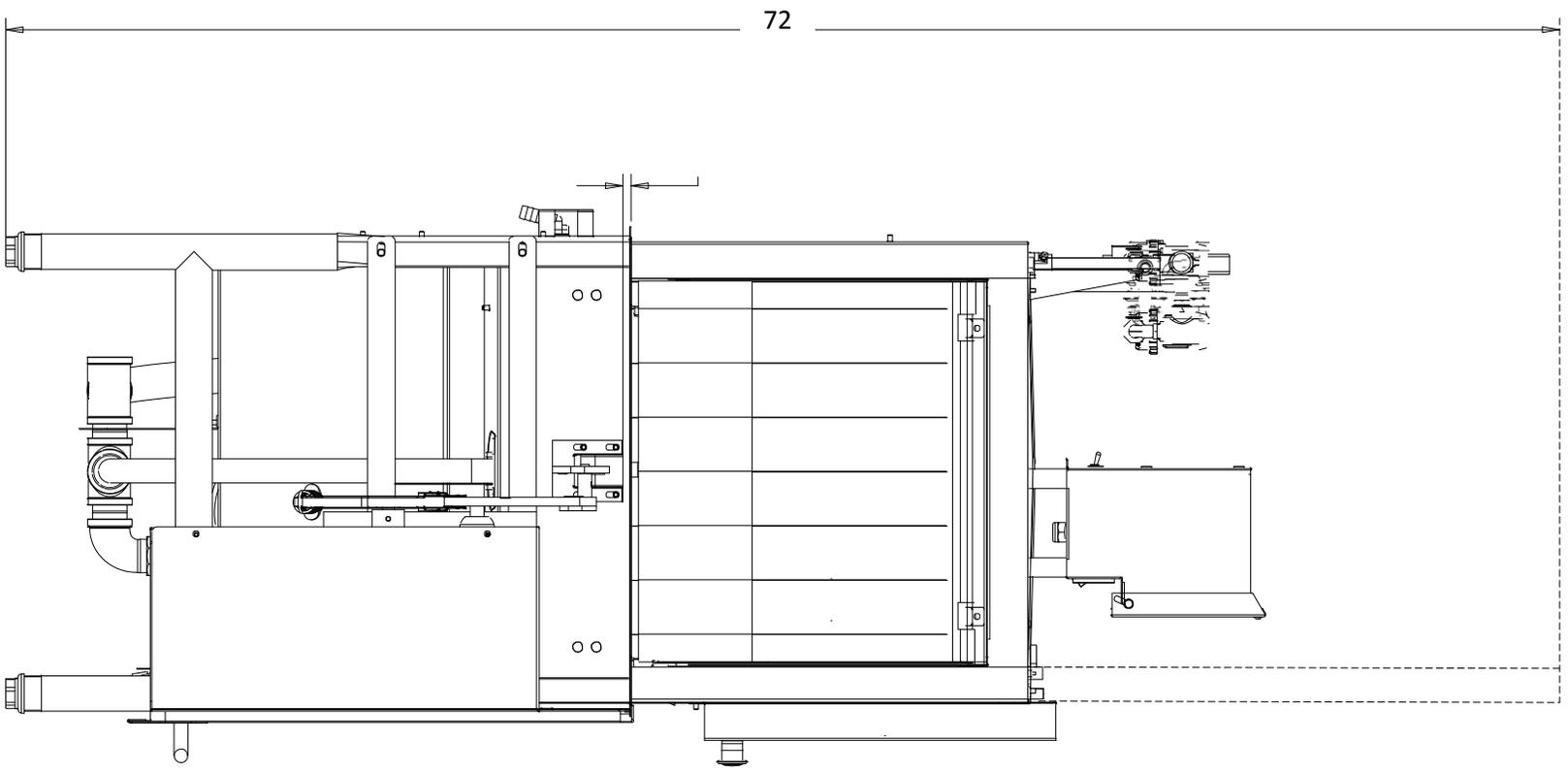


SECTION 1: SPECIFICATION INFORMATION
EC-44 (RIGHT TO LEFT) DIMENSIONS, RIGHT SIDE



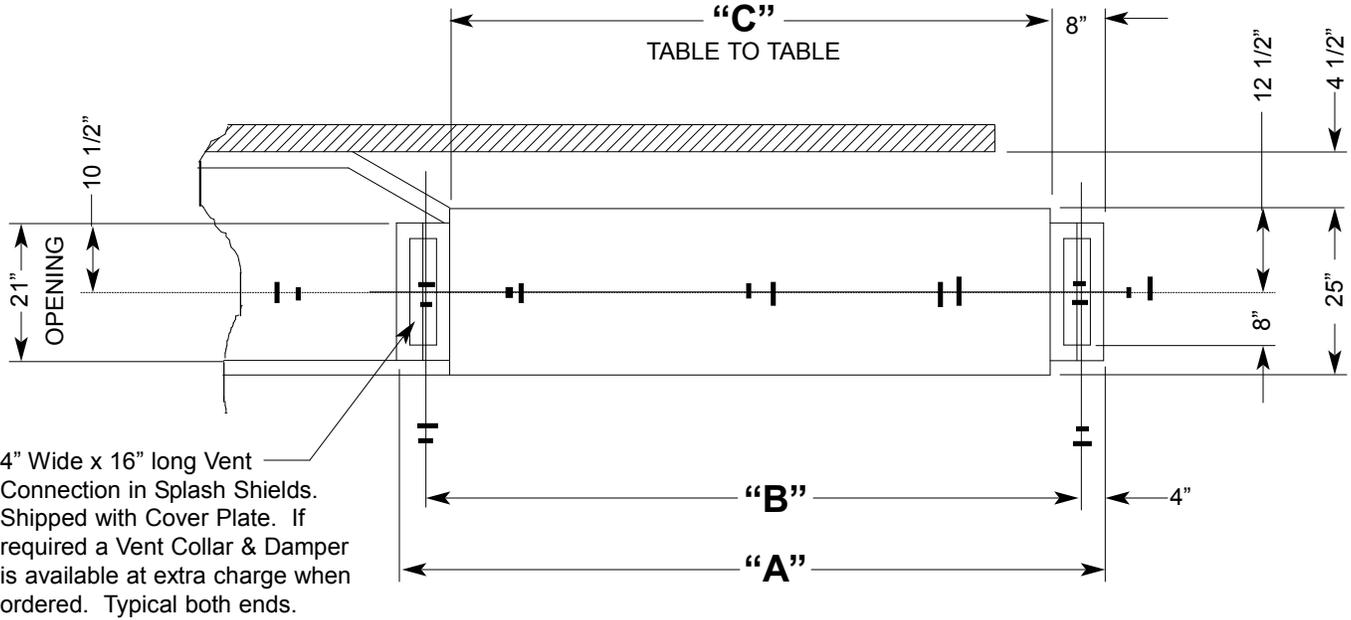
All dimensions in inches.

SECTION 1: SPECIFICATION INFORMATION
EC-44 (RIGHT TO LEFT) DIMENSIONS, LEFT SIDE

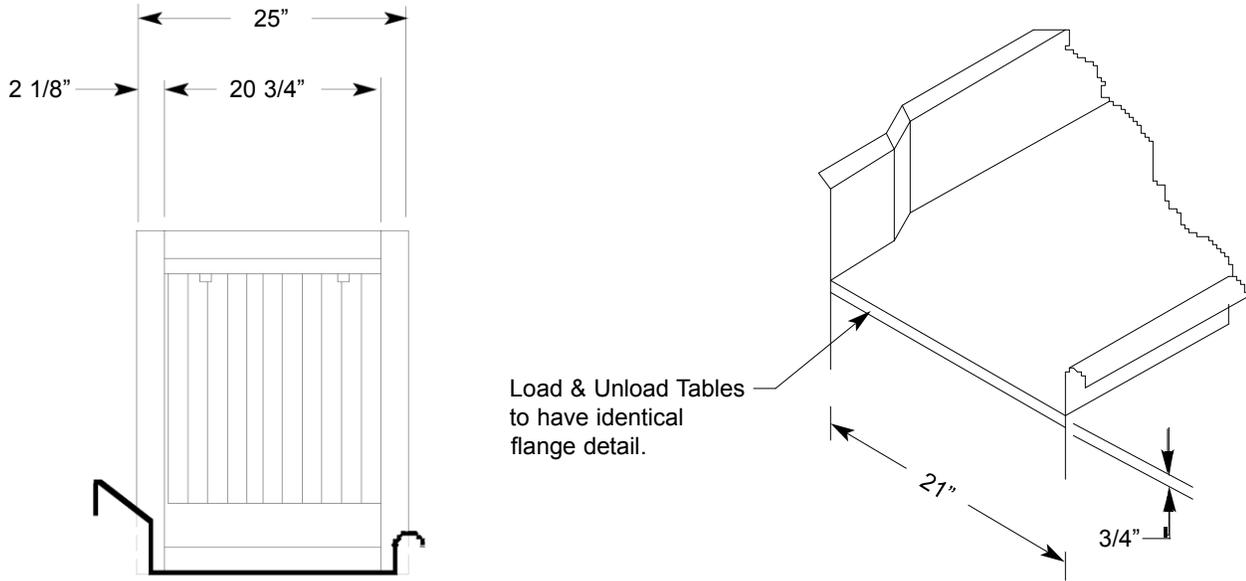


All dimensions in inches.

SECTION 1: SPECIFICATION INFORMATION
DISHTABLE DIMENSIONS



PLAN VIEW



DIMENSIONS EC44 (EC66):

- "A" = 60" ("A"=82")
- "B" = 51.5" ("B"=74")
- "C" = 44" ("C"=66")

SECTION 1: SPECIFICATION INFORMATION

ALL MODELS SPECIFICATIONS, VENTILATION & ELECTRICAL REQUIREMENTS

RACKS PER HOUR:

ALL MODELS 244

CAPACITIES:

EC-44/EC-44 HH WASH TANK (GALLONS) 20
 EC-44/EC-44 HH WASH PUMP (GPM) 270
 EC-66/EC-66 HH WASH TANK (GALLONS) 20
 EC-66/EC-66 HH WASH PUMP (GPM) 270
 EC-66/EC-66 HH PREWASH TANK (GALLONS) 16
 EC-66/EC-66 HH PREWASH PUMP (GPM) 120

CONVEYOR SPEED:

All Models 6.8 FPM

GALLONS PER RACK:

All Models 0.91

WATER REQUIREMENTS (ALL MODELS):

WASH TEMPERATURE (hot water sanitizing) 160°F
 WASH TEMPERATURE (chemical sanitizing) 140°F
 RINSE TEMPERATURE (hot water sanitizing) 180°F
 RINSE TEMPERATURE (chemical sanitizing) 120°F
 FLOW PRESSURE (PSI) 20±5
 FLOWRATE (GPM) 3.72

NOTE: Temperatures listed are minimums.

SANITIZER REQUIREMENTS:

All Models in Chemical Sanitizing Mode 50PPM

VENTING REQUIREMENTS (all models):

INPUT END (CFM) 200
 OUTPUT END (CFM) 400
 TOTAL (CFM) 600

NOTE: For ventilation systems that connect directly to the conveyor, it is recommended to use baffled ventilation scoops to allow better control of the airflow out of the machine as well as a timing circuit for the exhaust fan to minimize the amount of time the fan runs with an idle dishmachine. Parts information for ventilation scoops and the exhaust fan timer kit can be found in this manual.

MOTOR ELECTRICAL REQUIREMENTS:

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 PREWASH MOTOR HP (EC66/EC66 HH ONLY) 1
 WASH MOTOR HP 2

NOTE: Typical Electrical Circuit is based upon (1) full amperage load of the machine plus 25% of the wash pump amperage load and (2) typical fixed-trip circuit breaker sizes as listed in the NEC 2008 Edition. Local codes may require more stringent protection than what is displayed here. Always verify with your electrical service contractor that your circuit protection is adequate and meets all applicable national and local codes. These numbers are provided in this manual simply for reference and may change without notice at any given time.

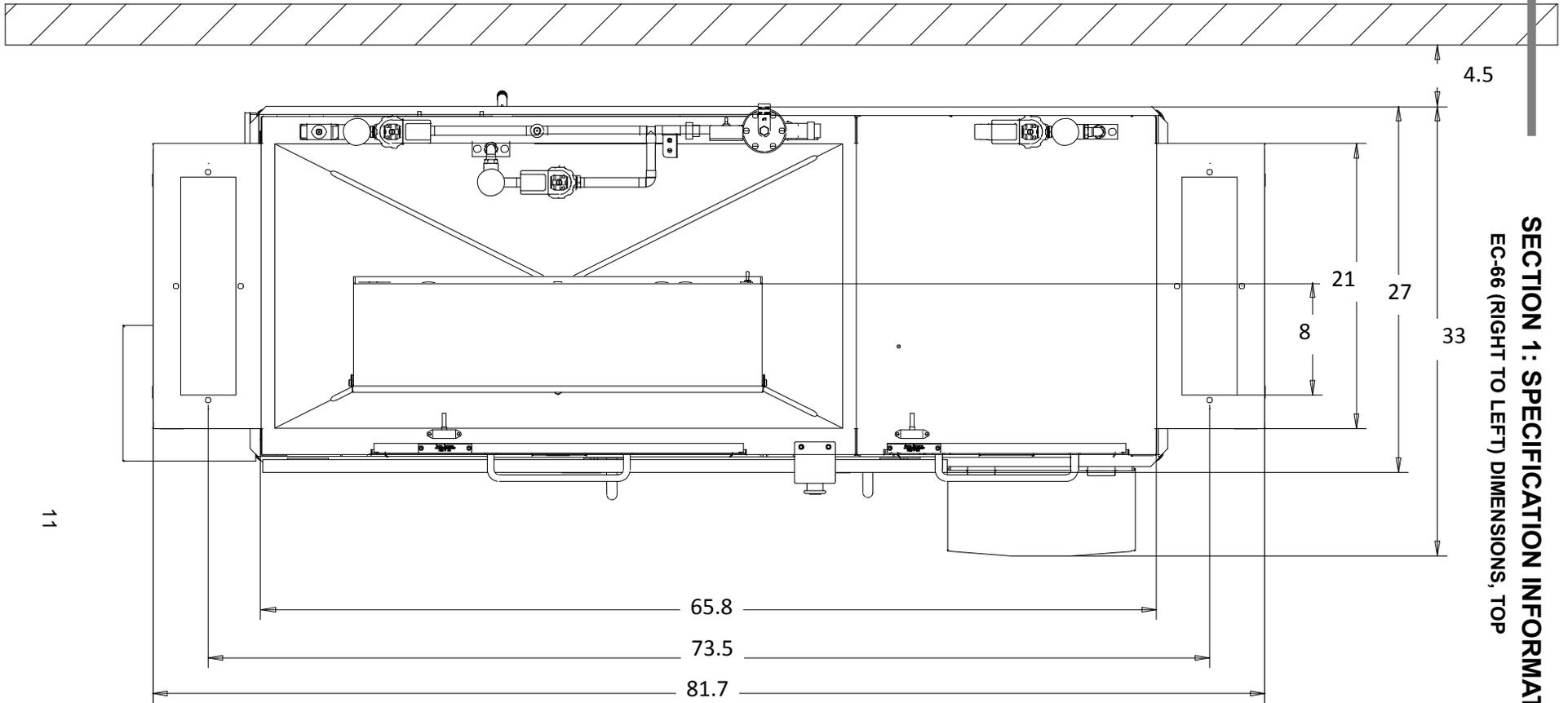
EC-44/EC-44HH ELECTRICAL REQUIREMENTS:

VOLTS	PH	HZ	WASH HEATER RATINGS	TOTAL AMPS	TYPICAL ELECTRICAL CIRCUIT
208V	1	60	15KW@208V	82.65 A	90 AMP
230V	1	60	15KW@230V	75.85 A	80 AMP
208V	3	60	15KW@208V	48.75 A	60 AMP
230V	3	60	15KW@230V	44.6 A	50 AMP
460V	3	60	15KW@460V	22.3 A	25 AMP

EC-66/EC-66 HH ELECTRICAL REQUIREMENTS:

VOLTS	PH	HZ	WASH HEATER RATINGS	TOTAL AMPS	TYPICAL ELECTRICAL CIRCUIT
208V	1	60	15KW@208V	88.65 A	100 AMP
230V	1	60	15KW@230V	81.85 A	90 AMP
208V	3	60	15KW@208V	52.15 A	60 AMP
230V	3	60	15KW@230V	48.0 A	60 AMP
460V	3	60	15KW@460V	24.1 A	30 AMP

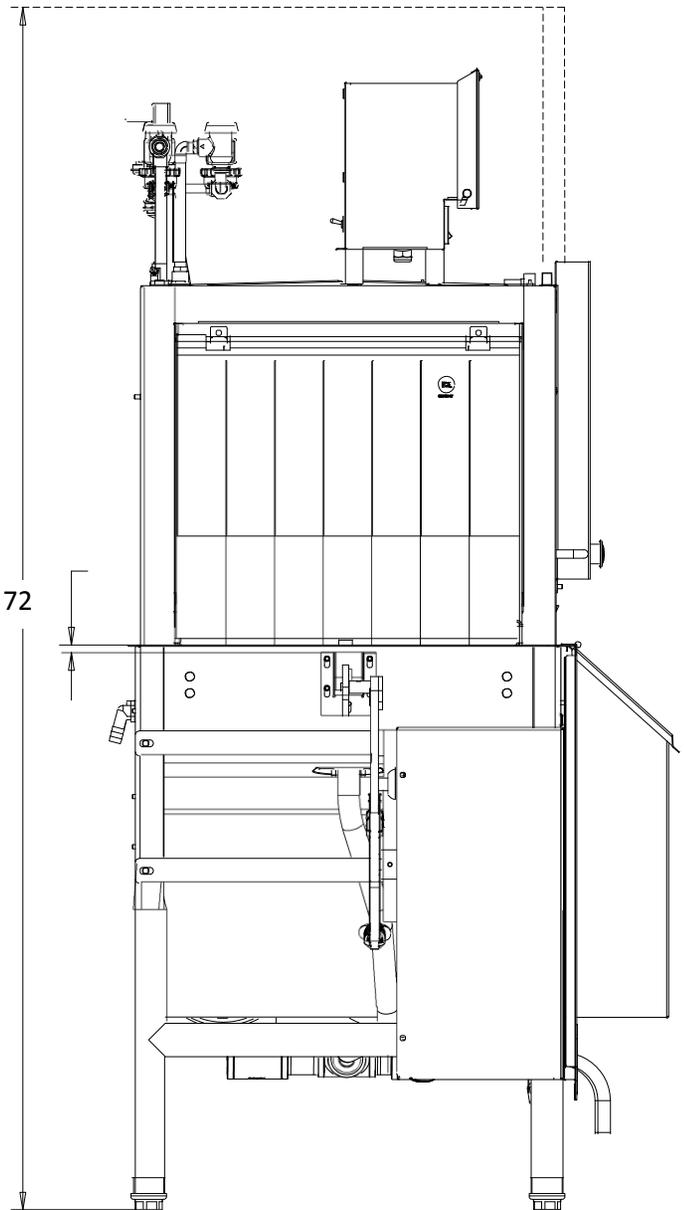
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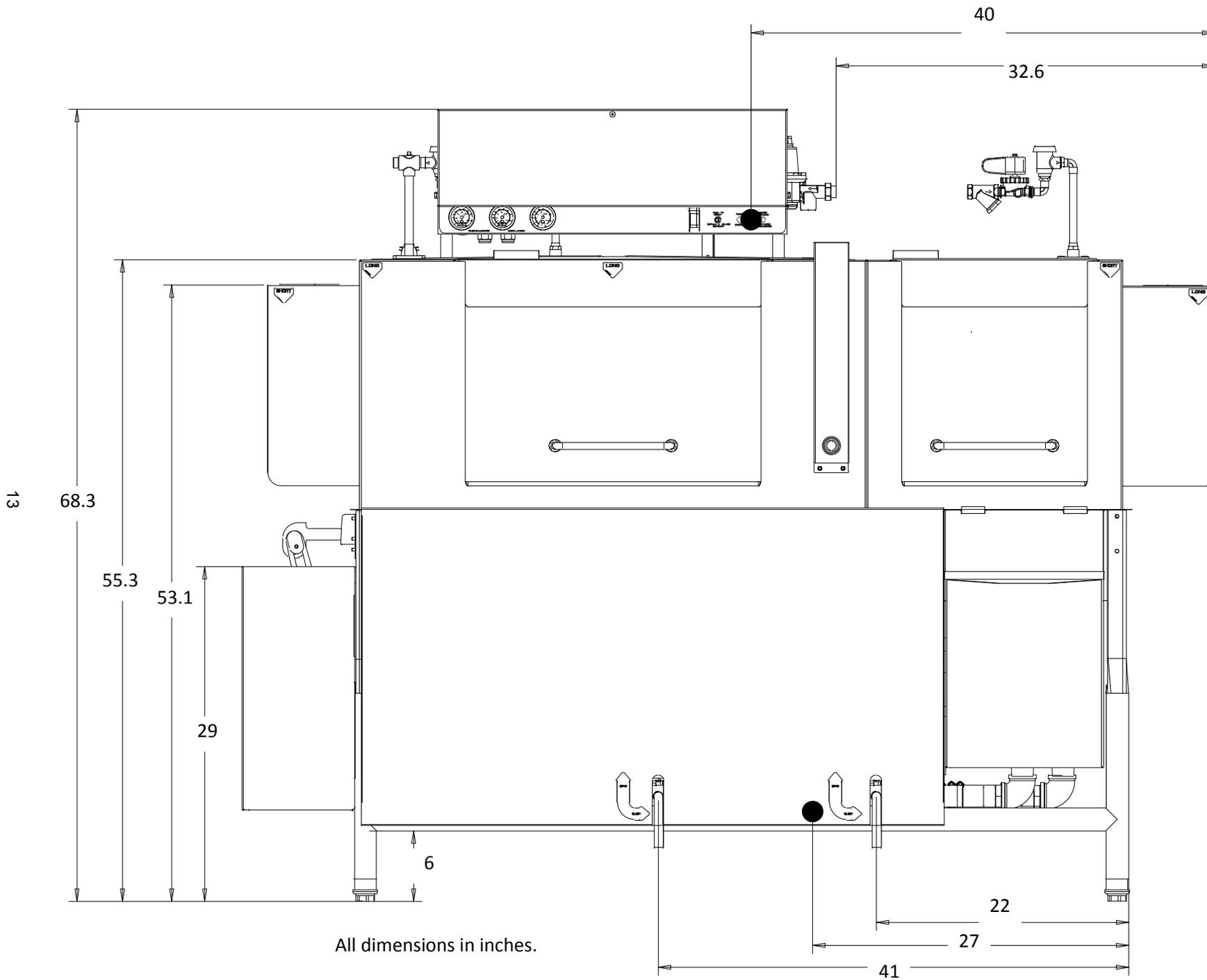
SECTION 1: SPECIFICATION INFORMATION
EC-66 (RIGHT TO LEFT) DIMENSIONS, TOP

All dimensions in inches.

SECTION 1 : SPECIFICATION INFORMATION
EC-66 (RIGHT TO LEFT) DIMENSIONS, LEFT SIDE



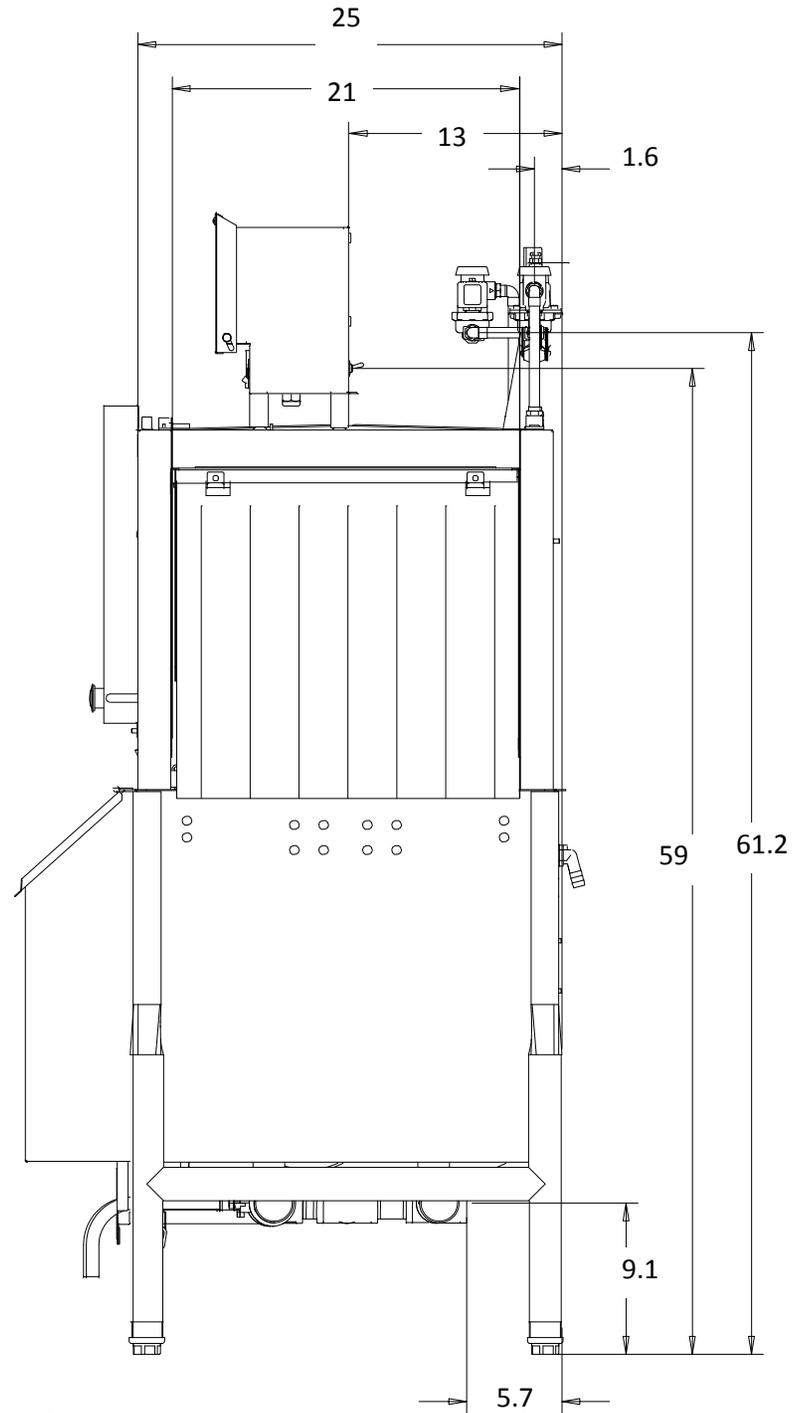
All dimensions in inches.



All dimensions in inches.

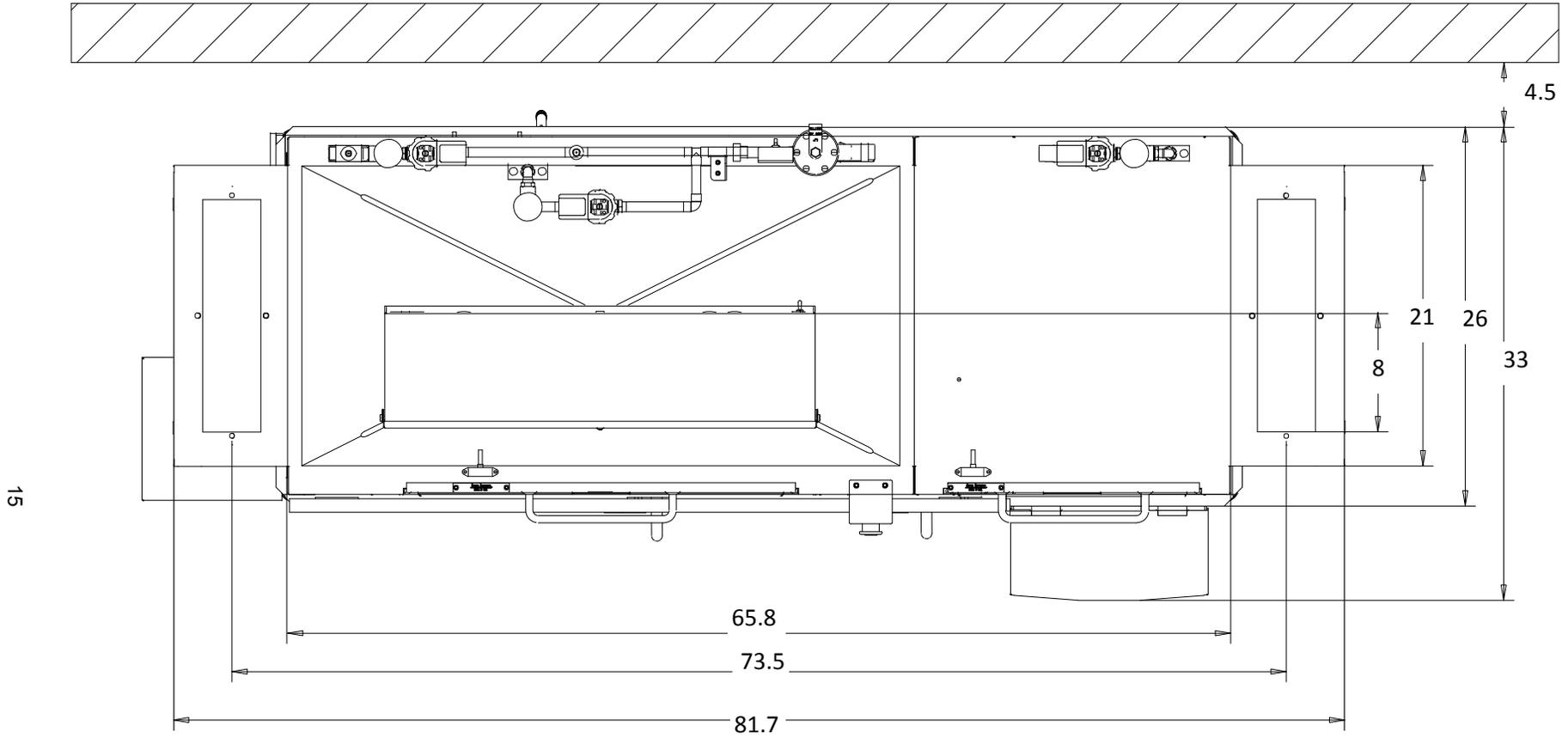
SECTION 1: SPECIFICATION INFORMATION
 EC-66 (RIGHT TO LEFT) DIMENSIONS, FRONT

SECTION 1: SPECIFICATION INFORMATION
EC-66 (RIGHT TO LEFT) DIMENSIONS, RIGHT SIDE



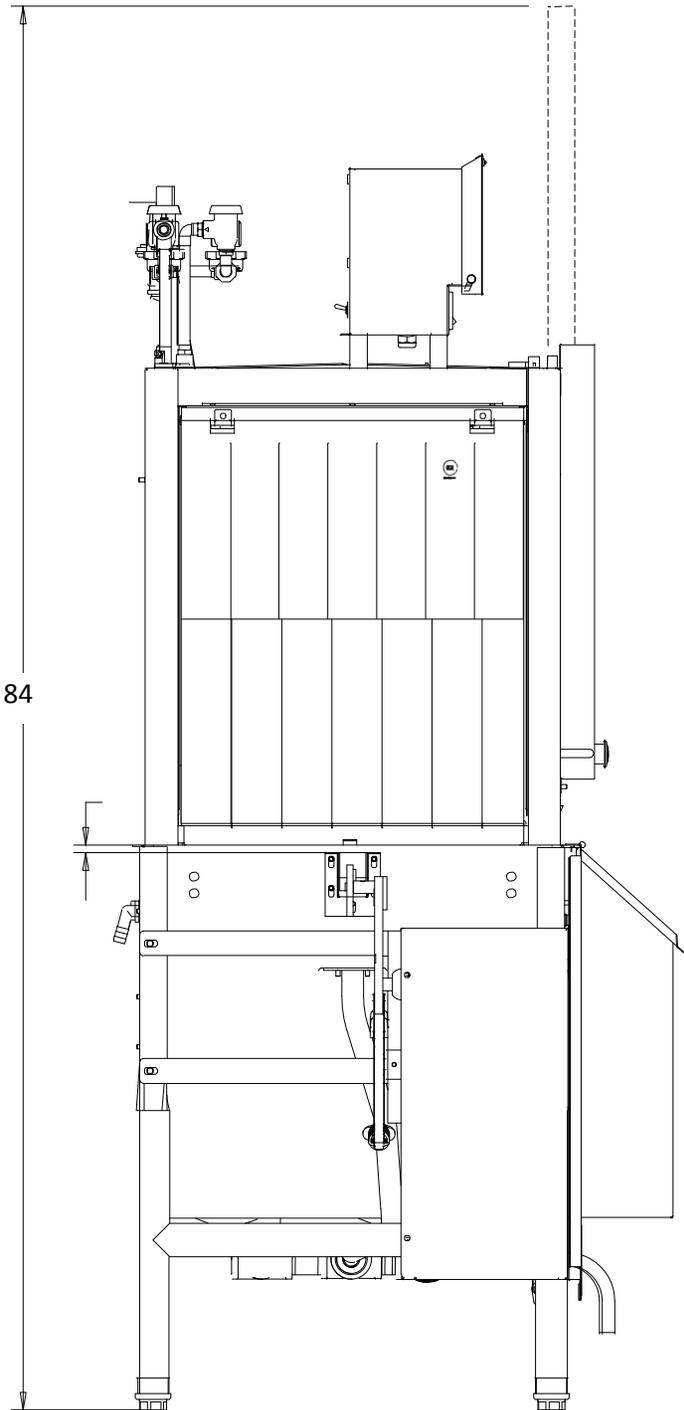
All dimensions in inches.

SECTION 1: SPECIFICATION INFORMATION
EC-66HH (RIGHT TO LEFT) DIMENSIONS, TOP



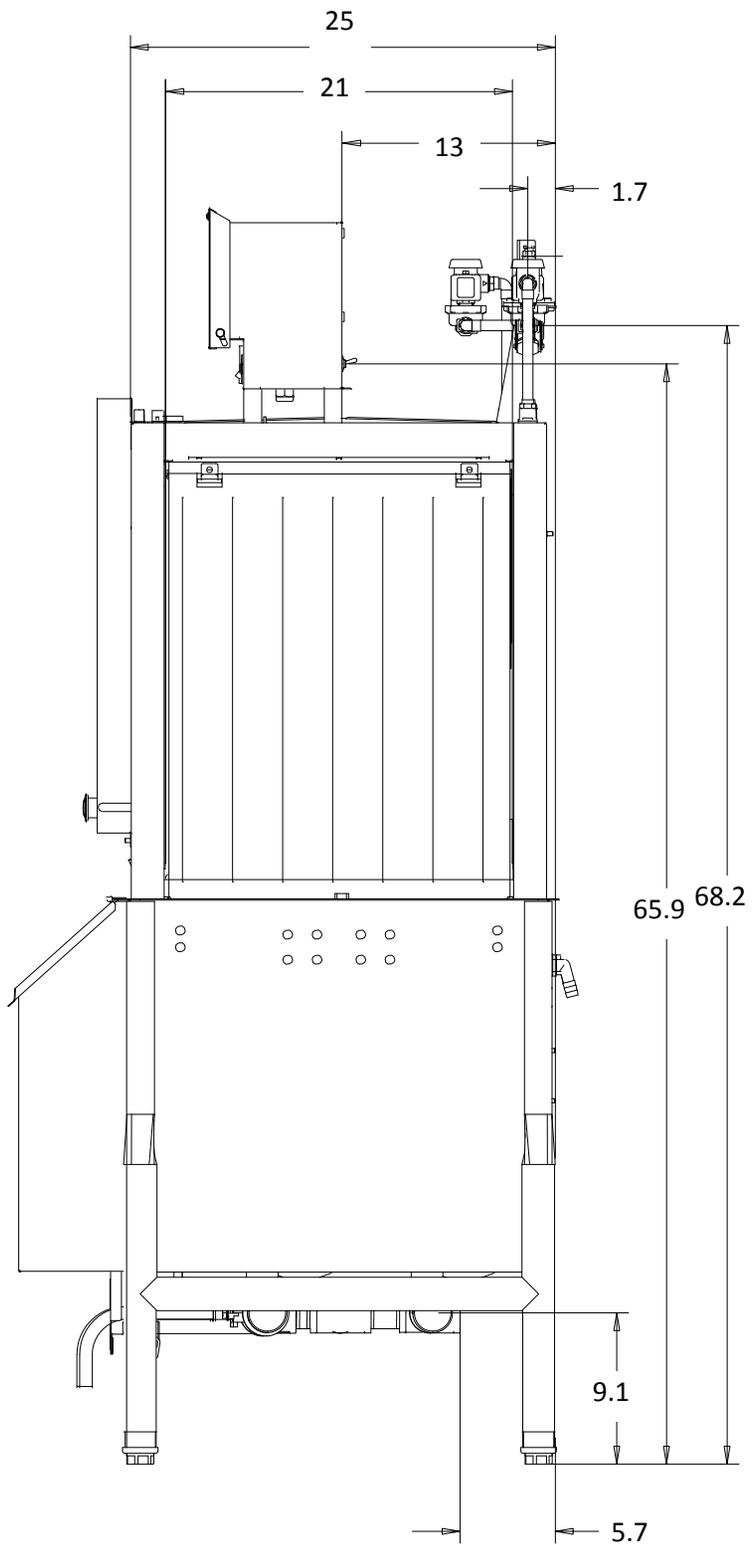
All dimensions in inches.

SECTION 1 : SPECIFICATION INFORMATION
EC-66HH (RIGHT TO LEFT) DIMENSIONS, LEFT



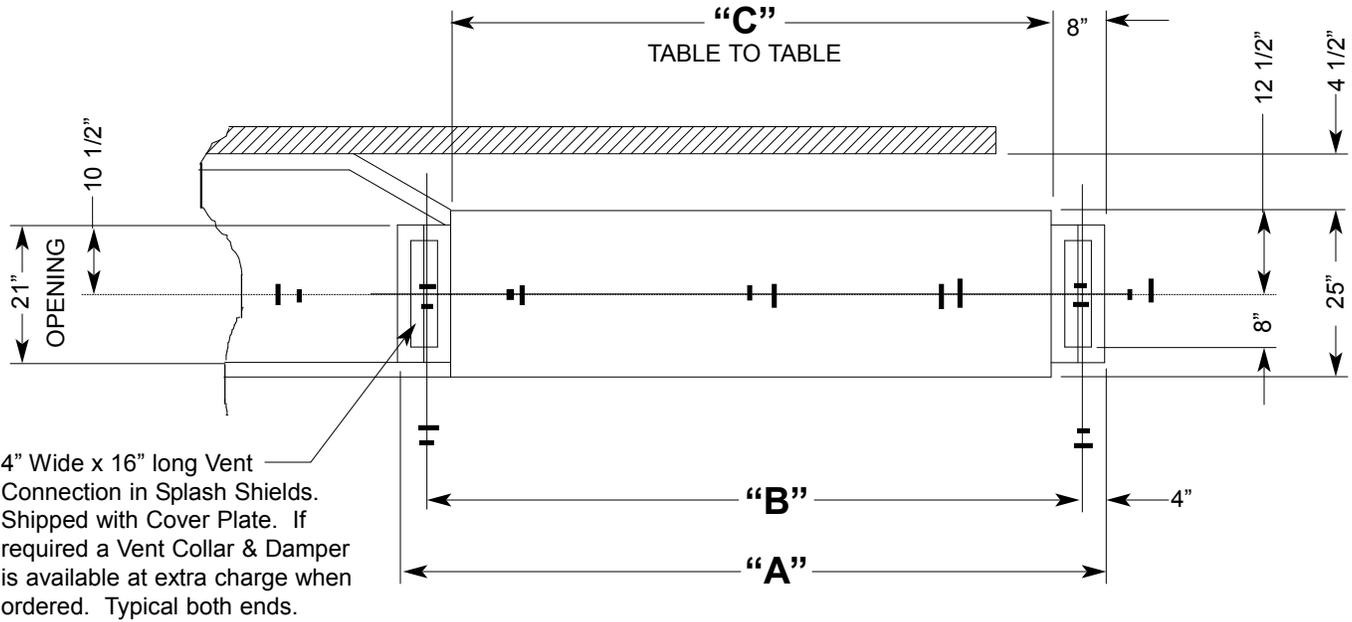
All dimensions in inches.

SECTION 1 : SPECIFICATION INFORMATION
EC-66HH (RIGHT TO LEFT) DIMENSIONS, RIGHT SIDE

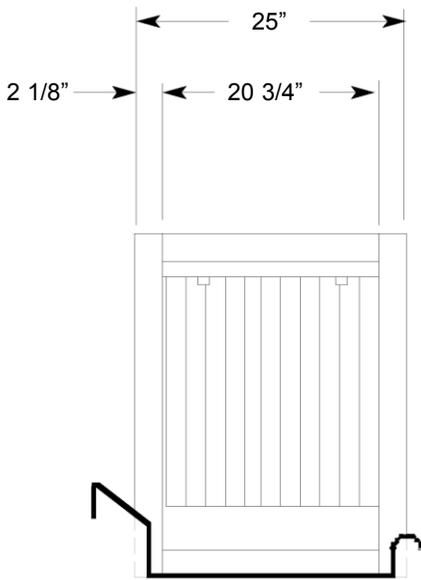


All dimensions in inches.

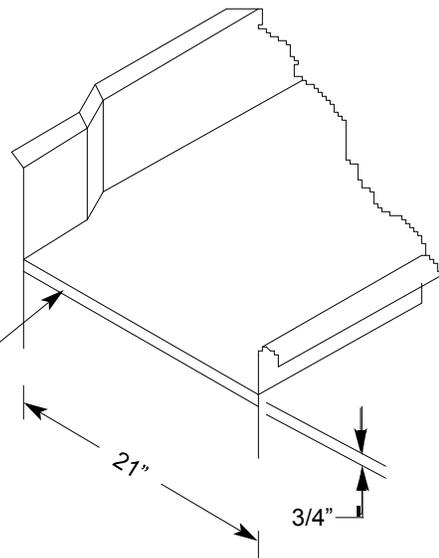
SECTION 1: SPECIFICATION INFORMATION
DISHTABLE DIMENSIONS



PLAN VIEW



Load & Unload Tables to have identical flange detail.



DIMENSIONS EC44 (EC66):

"A" = 60" ("A"=82")

"B" = 51.5" ("B"=74")

"C" = 44" ("C"=66")



Power/Connections

Approximate Total Load	AMPS
208V / 60HZ / 3PH	54.0
208V / 60HZ / 1PH	90.8
230V / 60HZ / 3PH	50.0
230V / 60HZ / 1PH	84.0
460V / 60HZ / 3PH	24.4

Booster Heater Options	KW	AMPS
External 40°F Min. Rise		
208V / 60HZ / 3PH	34.5	95.8
230V / 60HZ / 3PH	36	90.5
460V / 60HZ / 3PH	36	45.2

External 70°F Min. Rise	KW	AMPS
208V / 50 or 60HZ / 3 PH	45	125.0
230V / 50 or 60HZ / 3PH	45	108.0
460V / 50 or 60HZ / 3PH	45	54.0

Venting Requirements (CFM)	
Input end	200
Output end	400
Total CFM	600

Water Requirements	
Incoming Prewash Tank Temperature (°F)	140
Incoming Wash Tank Temperature (°F)	180
With 36 KW booster heater option (°F)	140
With 45 KW booster heater option (°F)	110
Gallons per hour	
Hi-temp sanitization	234
Chemical sanitization	234
Gallons per rack	
Hi-temp sanitization	0.94
Chemical sanitization	1.0
Prewash Tank Capacity (Gallons)	16.0
Wash Tank Capacity (Gallons)	15.4
Incoming Waterline Size (IPS) (Minimum)	
Prewash Tank Fill	3/4
Wash Tank Fill/Rinse	3/4
Flow Pressure (PSI)	15-25
Flow Rate Minimum (GPM)	
Hi-temp sanitization	3.9
Chemical sanitization	3.9
Drainline Size IPS (Minimum) (Inches)	1 1/2

Standard Features

- 248 racks per hour hi-temp sanitizing rinse.
234 racks per hour chemical sanitizing rinse.
- 0.94 gallons per rack hi-temp sanitizing rinse.
1.0 gallons per rack chemical sanitizing rinse.
- Incoming water pressure regulator
- Recirculating prewash feature virtually eliminates manual prerinse and saves on labor.
- Exclusive Adjust-A-Peak feature (patented) allows the owner operator to manually adjust the speed of the conveyor system from 124 racks per hour all the way to maximum capacity of 248/234 racks per hour.
- Standard 25" clearance allows owner operators the ability to wash large utensils, trays, and bun pans.
- Prewash section has three upper arms and two lower arms as opposed to two upper arms and one lower arm.
- Totally electro-mechanical; no solid state controls utilized.
- Fully automatic including auto-fill.
- Prewash auto fill requires 110-140°F separate connection and does not fill through the booster heater.
- Self-draining stainless steel pumps and impellers.
- Exclusive "Energy Guard" controls system operates prewash, wash and rinse sections only when a rack is being prewashed, washed or rinsed.
- A long 18" wash section as well as 18" separation between wash and rinse produces superior results.
- Convenient, externally operated lever drains.
- Deep well scrap basket conveniently located on front of machine facilitates removal of heavy food soil.
- Stainless steel frame, legs, adjustable bullet feet, and front appearance panel are all standard.
- Standard 8" vent cowls/splash shields on both wash and rinse ends of the machine.
- Heavy gauge construction for extra ruggedness and durability.

Performance/Capacities

Operating Capacity		Operating Temperatures	
Racks per hour		Prewash Tank-°F	110-140
Hi-temp Sanitization	248	Wash Tank-°F (Minimum)	
Chemical Sanitization	234	Hi-temp Sanitization	160
Dishes per hour		Chemical Sanitization	140
Hi-temp Sanitization	6200	Rinse-°F (Minimum)	
Chemical Sanitization	5850	Hi-temp Sanitization	180
Glasses per hour		Chemical Sanitization	140
Hi-temp Sanitization	6200		
Chemical Sanitization	5850	Minimum Chemical Sanitizer req.	
		Sodium Hypochlorite	50
		(Chlorine) (PPM)	
Steam Coil Tank Heat		Dimensions (Inches)	
Steam Connection IPS (Inches)	3/4	Length between dishtables	80
Steam Flow Pressure (PSIG)	10-20	Machine width	31
Consumption @ 15 PSIG (lbs/hr)	60	Wall Clearance (Minimum)	4.5
		Cavity/dish clearance (Maximum)	25
Prewash Pump Motor Horsepower	2		
Prewash Pump Capacity (GPM)	270	Shipping Information	
Wash Pump Motor HP	2	Weight (Lbs)	954
Wash Pump Capacity (GPM)	270	Dimensions (Inches)	
Wash Tank KW	15	Length	110
Conveyor Motor Horsepower	1/4	Depth	40
Conveyor Speed (feet/minute)		Height	78
Hi-temp Sanitization	6.9	Volume (Cubic feet)	199
Chemical Sanitization	6.5		

Specifications

NOTE: The AJ-80 series conveyor dishmachines are listed by the National Sanitation Foundation (NSF), Underwriters Laboratories Inc. (UL), and by the Canadian Standards Association (CSA). They also meet the requirements of A.S.S.E. Standard No. 1004.

PERFORMANCE: Fully automatic, single tank, rack conveyor dishwasher with a recirculating prewash designed to wash, rinse, and sanitize tableware and utensils commonly associated with the preparation and consumption of food items in a commercial foodservice operation. Sanitization is accomplished either through hi-temp sanitization utilizing 180-195°F fresh water rinse or through low-temp sanitization utilizing a sanitizer agent (5.25% sodium hypochlorite) injected into 140°F minimum fresh water rinse. The unit conveys standard 20" x 20" dishracks through a recirculating prewash section where 120 gallons per minute (GPM) of 110-140°F water is pumped over the rack to mechanically prepare the tableware for washing. Next, the rack is conveyor driven into a detergent laden wash section where 270 of 160°F (140°F in a low-temp chemical sanitizing machine) wash water is pumped over the dishrack to remove the food soil. Finally, the rack is conveyor driven into a final rinse section where a fresh water final rinse spray system removes residual detergent and sanitizes. For hi-temp sanitizing, the unit must be installed to a potable water line capable of supplying 234 gallons per hour between 180-195°F at 20 PSI flow pressure for maximum hourly rack capacity of 248 racks per hour. For low-temp sanitizing, the unit must be installed to a potable water line capable of supplying 234 gallons per hour between 140-150°F at 15-25 PSI flow pressure for maximum hourly rack capacity of 234 racks per hour. An NSF recognized chemical feeder system must be supplied and installed by others and must inject a minimum of 50 PPM 5.25% sodium hypochlorite (chlorine) into the final rinse line to meet chemical sanitization requirements.

CAUTION: Use of sodium hypochlorite (chlorine) may have an adverse effect on materials including, but not limited to, silver and silver plate, pewter, and aluminum.

CONSTRUCTION: All stainless steel components are 18-8 304 series stainless steel. No 400 series stainless steel and/or plastics are utilized. Frame is constructed of 2" diameter stainless steel tubing formed and completely saddle welded for superior strength. The prewash tank, wash tank and rinse chamber are formed and heliarc welded 16 gauge #2B finish. Hood is 16 gauge #3 finish. Stainless steel feet are adjustable $\pm 1/2"$.

PREWASH PUMP: Internal prewash pump located inside the prewash tub is totally stainless steel as is the impeller. The prewash pump itself is totally integral with the motor. Prewash water is recirculated from the prewash tank through the manifolds and wash arm system at the rate of 120 GPM.

WASH PUMP: Internal wash pump located inside the wash tub is totally stainless steel as is the impeller. The wash pump itself is totally integral with the motor. Wash water is recirculated from the wash tank through the manifolds and wash arm system at the rate of 270 GPM.

PREWASH PUMP MOTOR: A 2 HP totally enclosed, fan cooled type motor drives the prewash pump and arms. Single-phase motors are capacitor start, induction run with internal thermal overload protection. Three-phase motors are induction run with external overload protection. Motor shaft is supported by permanently lubricated grease packed ball bearings.

WASH PUMP MOTOR: A 2 HP totally enclosed, fan cooled type motor drives the wash pump and arms. Single-phase motors are capacitor start, induction run with internal thermal overload protection. Three-phase motors are induction run with external overload protection. Motor shaft is supported by permanently lubricated grease packed ball bearings.

CONVEYOR SYSTEM: Racks are conveyed through the machine by a center-mounted, heavy-duty stainless steel pawl bar with stainless steel cast, counter-weighted, wide surface pawls. The pawl bar is designed to not interfere with spray patterns in the prewash, wash, and rinse section. The pawl bar is driven by a 1/4 HP motor and worm drive gear reduction unit. The conveyor motor itself is totally enclosed, non-ventilated. Single-phase motors are capacitor start, induction run with internal thermal overload protection. Three-phase motors are induction run with external overload protection. Pawl bar conveyor drive unit is mounted on the left hand side of the machine and is enclosed with a removable stainless steel cover. Maximum conveyor speed is 6.9 feet per minute for hi-temp machines and 6.5 feet per minute for low-temp chemical sanitizing machines.

ADJUST-A-PEAK: The Adjust-A-Peak feature is a mechanical feature located on the pawl bar drive unit itself and allows the end-user to slow down the speed of the conveyor drive unit when enhanced results are required (i.e. baked-on food soil) or increase the speed of the conveyor drive unit when maximum capacity is required. By slowing down the conveyor, a rack of tableware remains in the prewash, wash, and rinse sections for longer periods of time. When soil loads are heavy (i.e. pots and pans, trays, and bun pans), adjusting the conveyor to slower speeds means outstanding results.

CHAMBER: The chamber has a standard clearance of 25" which is the highest clearance in the industry—even higher than competitive higher hood options. This adds to the versatility of the machine since you can easily accommodate larger utensils such as sheet pans and 60 quart mixing bowls. The combination of a higher hood in conjunction with manually slowing down the conveyor utilizing the Adjust-A-Peak feature produces superior results as well as adding to the versatility of the machine.

CONTROLS: Controls are located in a stainless steel control box mounted on top of the machine for ease of access and increased reliability. Power "ON/OFF" switch is the only manual switch required. "Energy Guard" fully automates the machine and utilizes switching logic to operate prewash, wash, and rinse sections only when a rack is in place as well as turning the conveyor off when a rack exits the machine and there are no other racks in the machine. Regardless of machine voltage, all control circuitry will be operated from a 110 volt control circuit transformer. Again, the Adjust-A-Peak feature eliminates the need for manual controls since you have the ability to slow down the conveyor for extended prewash, wash, and rinse contact time. The unit is completely wired with 105°C, 600V thermoplastic insulated wire and routed through UL approved conduit. The control circuit itself is protected by a manual reset 1 AMP overload protector located on the front of the control box.

FILL: Initial fill of the prewash tank and the wash tank is automatic when machine is initially energized. There are separate fills to each tank and each is controlled by its own standard solenoid valve and vacuum breaker assembly. The prewash tank needs to be hooked up to a water line capable of filling with 110-140°F incoming potable water rather than filling with 180°F from the booster heater through the wash tank as does the competition. If the cold water thermostat option is utilized in the prewash, an additional cold water line needs to be hooked up to the machine. The wash tank fill line needs to be hooked up to a 180°F minimum incoming potable water line which normally would be supplied by an external booster heater or our own optional Hatco booster heater packages. The fill solenoids for both tanks are activated by stainless steel float systems located in the individual tanks for required maintenance of tank water levels.

RECIRCULATING PREWASH: The prewash tank itself has a 16.0 gallon capacity and maintains that level with a skimming type overflow. Prewashing action is accomplished by recirculating 110-140°F water through 20 separate stripping nozzles through three upper arms and two lower arms. This superior action removes heavy soil and deposits it in a large outside deep well scrap basket located on the front of the machine for easy access. A secondary removable pump intake strainer protects the pump itself. Make-up water comes from the wash at the rate of approximately 2 GPM. All five wash arms are easily removable and along with removable prewash arm end caps, are easily cleanable without the use of tools.

RECIRCULATING WASH: The wash tank has a 20.0 gallon capacity and maintains that level with a skimming type overflow that flows excess wash water into the prewash tank. Washing action is accomplished by recirculating detergent laden wash water in the wash tank through upper and lower wash arms. Make-up water comes from the final rinse section and is controlled at

approximately 2 GPM. The arms themselves are extended and create a longer wash section than competitive models. Wash section is automatically activated by racks as they pass through. Wash arms, upper and lower, contain 43 separate stripping nozzles for superior performance. Both wash arms are easily removable and along with removable wash arm end caps, are easily cleanable without the use of tools. Large stainless steel strainer pans as well as a pump intake strainer for secondary protection are readily accessible and removable for cleaning purposes. Knockouts and connections are provided to allow easy installation of detergent concentration sensor and dispenser tubing by others.

FINAL RINSE: Fresh pressurized rinse water enters the machine through a standard "Y" strainer, solenoid valve, and approved vacuum breaker assembly and is plumbed to upper and lower final rinse arms located at the output end of the machine. Single rows of fan jet nozzles are located on both rinse arms. Connection points are provided for both rinse agent injection and sodium hypochlorite (low-temp chemical sanitizing machines only) into the final rinse line by others. Total final rinse flow rate is 3.9 GPM.

DRAIN, OVERFLOW, AND MAKE-UP: The machine is designed to maintain appropriate prewash and wash tank water levels at all times even at low pressures. The overflow system is designed to automatically skim the surface of both tanks. Make-up water from the final rinse system not only replenishes the wash water but also helps maintain appropriate water levels as well as appropriate wash tank temperatures. Large levers located on the front panel of the machine operate drain valves and drains the prewash and wash tanks completely.

PRESSURE REDUCING VALVE:

Factory installed on incoming water line to control water pressure.

Additional Standard Equipment:

- Vent cowls/splash shields with 4" x 16" openings covered with removable plates for connection to exhaust ducts when required.
- Flexible strip curtains provided at the ends of the vent cowls as well as at the ends of the machine and separating the prewash, wash, and final rinse compartments.
- Extra large inspection doors located on front of the machine for easy access and cleanability and requiring only one hand operation.
- Safety door switches shut down the machine should either door be opened during operation.
- Stainless steel front appearance panel.
- Positive low level water protection for wash tank heat.
- Sealed dial type thermometers for prewash, wash, and rinse temperatures.

Optional Mandatory Specifications:

Wash Tank Heating Equipment (Choose One):

ELECTRIC: Low watt density 15 KW tubular heating element mounted inside the wash tank and easily removable from the outside. The heater is protected by a stainless steel float system as well as high limit overload protection. Tank water temperature is controlled and maintained by a fast reacting thermostat which controls the heating element.

STEAM: Stainless steel coils are utilized rather than injectors so that contaminated steam being injected into the water is not an issue. Stainless steel tubular steam coils are mounted inside the wash tank below the optimum water level. The coils are protected by a stainless steel float system. An external steam "Y" strainer and high temperature steam solenoid regulates the flow of steam through the coil. Tank temperature is controlled and maintained by a fast reacting thermostat which controls the operation of the steam solenoid. A float and thermostatic steam trap is provided and removes steam condensate from the steam coils which can either be plumbed to a drain or pumped back to the boiler if a condensate return system is available. Steam coils require a minimum of 10 PSIG flowing steam supply and a maximum of 20 PSIG. Install with a steam pressure regulator (by others) if steam supply exceeds 20 PSIG.

Optional Features and Accessories:

EXTERNAL 40°F ELECTRIC BOOSTER

HEATER: External Hatco booster heater boosts incoming 140°F water to a minimum of 180°F for hi-temp sanitizing rinse. Custom features include castone-lined tank, low water cutoff, pressure relief valve, as well as a pressure reducing valve. Unit is located on the right hand side of the machine, completely plumbed in, and with the controls circuitry completely interwired to the dishmachine. Power to the booster heater requires a separate electrical connection. Unless specified otherwise, electrical characteristics of the booster heater will be the same as that of the dishwasher. The booster heater is approximately 36 KW and is optional and available on 208/240/460 voltages/3 phase machines only.

EXTERNAL 70°F RISE BOOSTER HEATER:

External 45 KW Hatco booster heater capable of boosting incoming 110°F water a minimum of 70°F to a minimum of 180°F for hi-temp sanitizing rinse. Unit is located on the right hand side of the machine and comes completely preplumbed. Power to the booster heater requires a separate electrical connection. Unless specified otherwise, electrical characteristics of the booster heater will be the same as that of the dishwasher. The external booster heater is available in 208/240/480 voltages/3 phase only.

STEAM BOOSTER HEATER: Sized to be connected to a standard 140°F incoming water supply in order to insure 180-195°F hi-temp sanitizing final rinse requirements. Unit comes complete with steam "Y" strainer and high temperature steam solenoid as well as a steam pressure relief valve. Water temperature is controlled and maintained by a fast reacting thermostat which controls the operation of the steam solenoid. A float and thermostatic steam trap is provided and removes steam condensate from the coil which can either be plumbed to a drain or pumped back to a boiler if a condensate return system is available. Must be installed with a steam pressure regulator (by others) if steam supply exceeds 20 PSIG.

TABLE LIMIT SWITCH: Factory wired to machine and mounted to the backsplash of the table in the field. Prevents damage to conveyor drive system, racks, and dishes due to racks backing up on the output end of the machine. Highly recommended for clean dishtables less than 10 feet in length.

VENT COWL COLLARS: Factory installed 16" x 7" high collars located on the vent cowls to allow easy connection to an external exhaust system including a standard "pant-leg" type exhaust duct. Includes adjustable and lockable damper flap for fine tuning exhaust system to remove appropriate CFM requirements.

50 CYCLE (HERTZ) ELECTRICAL

CHARACTERISTICS: Units are available in 50 HZ in the following voltages: 208V/1 or 3PH, 230V/1 or 3PH, 380V/3PH, and 460V/3PH. Units operating at 50 HZ are not submitted for UL Listing.

COLD WATER THERMOSTAT: Provides an accurate method of controlling prewash tank heat to prevent "baking on" food soil in the prewash section. This feature is especially valuable for high protein soil loads such as eggs and cheese.

SIDELoader: Factory installed option on input end of conveyor machine. This feature allows the machine to be installed close to a corner and maximize dishroom space. The sideloader option is available in both the hooded and unhooded versions. See separate spec sheets for details.

EXHAUST VENT FAN CONTROL:

Automatically turns exhaust vent fan on when rack enters the machine. Delay timer also turns off the exhaust vent fan 5-10 seconds after rack exits machine when no other racks are being conveyed through the machine.

FLANGED FEET: Available for installations where permanent mounting to the floor is required. Fully adjustable for required height.

WATER HAMMER ARRESTOR: Installed inside the supply line.

AJ-80 Vision Series

Conveyors

Specifications

Note: Check and/or copy all that apply.

AJ-80 Series Rack Conveyor Dishwasher – Item No. _____

Shall be a Jackson AJ-80 Series, single tank rack conveyor dishwasher with 36" prewash. Sanitization shall be accomplished by using:

- _____ Hi-temp (180°F minimum) sanitizing rinse
_____ Low-temp (140°F minimum + sodium hypochlorite) chemical sanitizing rinse

Electrical characteristics shall be:

- | | |
|---------------------|---------------------|
| _____ 208V/60HZ/3PH | _____ 208V/50HZ/3PH |
| _____ 208V/60HZ/1PH | _____ 208V/50HZ/1PH |
| _____ 230V/60HZ/3PH | _____ 230V/50HZ/3PH |
| _____ 230V/60HZ/1PH | _____ 230V/50HZ/1PH |
| _____ 460V/60HZ/3PH | |

Wash tank heating shall be a minimum of 160°F for hi-temp applications and 140°F for low-temp chemical sanitizing applications and accomplished by:

- _____ 15 KW electric heating elements thermostatically controlled.
_____ Stainless steel steam coils thermostatically controlled.

Direction of rack flow shall be (when standing in front of machine):

- _____ Right-to-Left _____ Left-to-Right

Unit shall have the following features as optional extras:

- _____ External Hatco 36 KW booster heater for a minimum 40°F rise and available in the following voltages:
_____ 208V/50 or 60HZ/3PH
_____ 240V/50 or 60HZ/3PH
_____ 480V/50 or 60HZ/3PH
- _____ External Hatco 45 KW booster heater for a minimum 70°F rise and available in the following voltages:
_____ 208V/50 or 60HZ/3PH
_____ 240V/50 or 60HZ/3PH
_____ 480V/50 or 60HZ/3PH
- _____ Steam booster heater.
- _____ Table limit switch completely prewired and extending from the output end of the machine, available in 9'0" length.

Unit shall have the following features:

- Capacity of 248 racks per hour utilizing 0.94 gallons of water per rack for hi-temp sanitizing rinse.
- Capacity of 234 racks per hour utilizing 1.0 gallons of water per rack for low-temp chemical sanitizing rinse.
- Incoming water pressure regulator.
- Adjust-A-Peak conveyor drive system to manually adjust rack capacity of the machine.
- Minimum 25" clearance throughout machine.
- Energy Guard controls system which prewashes, washes rinses and conveys a rack through the machine only when a rack is in place.
- Completely electro-mechanical; no solid-state controls.
- Fully automatic operation including auto-fill.
- Prewash section shall have 3 upper arms and 2 lower arms as well as a 2 HP pump.
- Prewash must have separate fill line rather than filling through the wash tank from the booster heater with 180°F heated water.
- Prewash pump, wash pump, and the impellers completely of stainless steel and self-draining.
- Wash section must be a minimum of 18" in length as well as 18" separation between recirculating wash and final rinse.
- Convenient, externally operated lever drains.
- Vent cowls/splash shields with extra curtains on both prewash and rinse ends of the machine.
- Stainless steel frame, legs, adjustable bullet feet, and front appearance panel.
- All 304 series stainless steel construction; no. 400 series stainless steel and no plastics utilized.

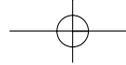
- _____ Table limit switch completely prewired and extending from the output end of the machine, available in 12'0" length.
- _____ Table limit switch completely prewired and extending from the output end of the machine, available in 15'0" length.
- _____ Installed 4" x 16" x 7" high vent cowl collars for easy connection to an external exhaust system and including adjustable and lockable damper flaps.
_____ output end only _____ input end only
_____ both ends
- _____ Pressure reducing valve factory installed on machine.
- _____ Incoming water hammer arrestor completely installed.
- _____ Sideloader installed on input end of machine.
_____ unhooded sideloader _____ hooded sideloader
- _____ Exhaust fan control controls external exhaust fan power and duration time.
- _____ Flanged feet for permanent in-place mounting to the floor.



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07610-002-66-70
All specifications subject to change without notice.



AJ-80 Vision Series



Left to Right Operation Shown

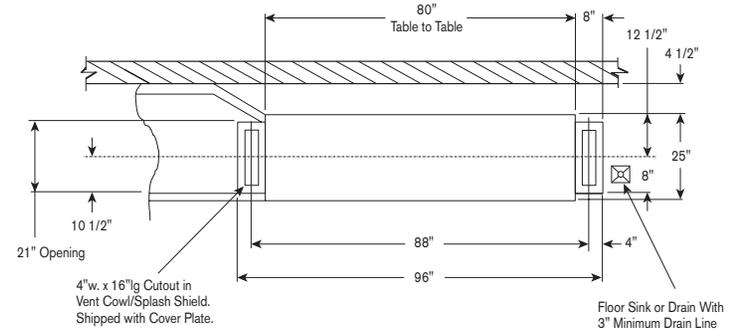
Legend to Drawing

- A** - Machine water inlet 3/4" I.P.S., 180°F Hi-temp, 140°F Low-temp minimum, 69 5/8" above finished floor
- B** - Electrical connection - See table for amperage requirements
- C** - Drain connection-1 1/2" I.P.S.
- D** - Vent collar 4"w. x 16"lg x 7"high - **Optional**
- E** - Vent collar standard
- F** - Incoming low pressure steam connection, 3/4" FPT (gate valve supplied) - **Optional**
- G** - Condensate return connection, 3/4" FPT (return to boiler feeder or open drain)
- H** - Prewash water inlet 3/4" I.P.S. 110°F-140°F
- J** - Cold water thermostat plumbing connection 3/4" I.P.S. - **Optional**
- *Steam tank heat option only**
Note: All vertical dimensions are +/- 1/2" from floor due to adjustable bullet feet

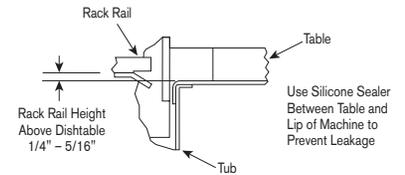
Approximate Total Load Amps

AJ-80 Series Electrical Data	Electric Tank Heat Models: AJ-80CE & AJ-80CEL		Steam Tank Heat Models: AJ-80CS & AJ-80CSL		Optional 36 KW Electric Booster Heater
	1-PH	3-PH	1-PH	3-PH	
208 Volts 60 Cycles	90.8	54.0	18.3	10.1	*95.9
230 Volts 60 Cycles	84.0	50.0	18.3	10.1	90.5
460 Volts 60 Cycles	N/A	24.4	N/A	5.1	45.2

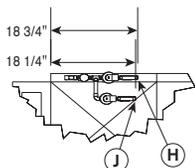
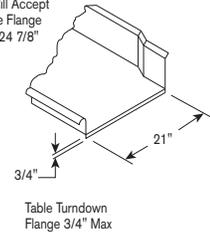
*208 Volt 3-PH booster is derated from 36KW to 34.5KW
Note: Optional booster heater requires separate electrical connection



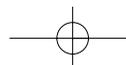
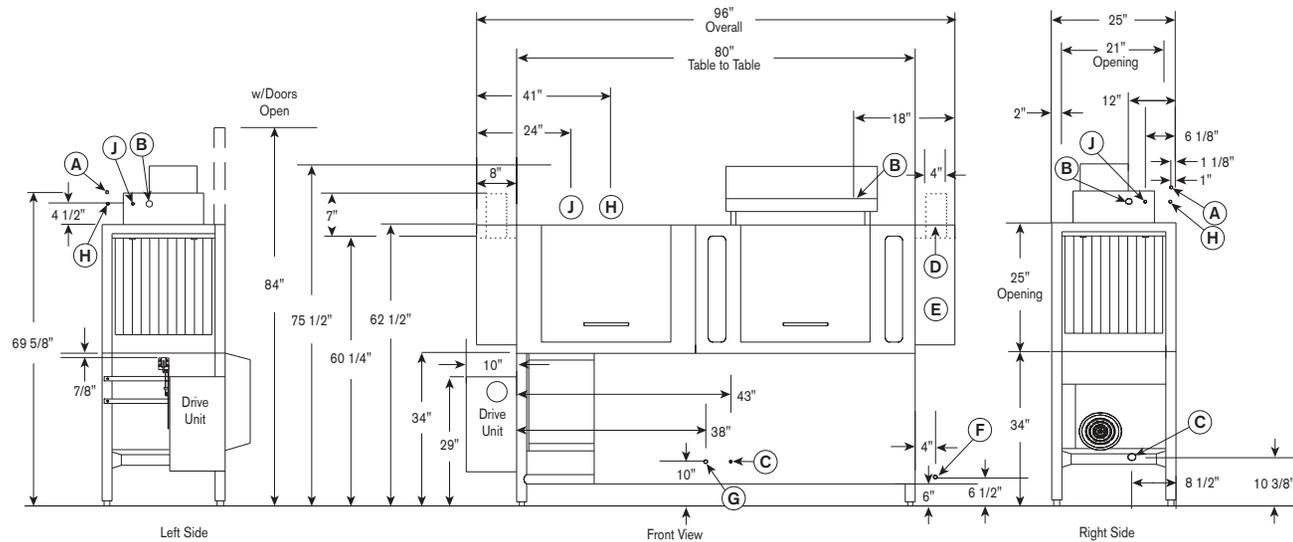
Recommended Table Fabrication



Note: Tub Will Accept a Table Flange Up to 24 7/8"



Prewash Plan View Section With Cold Water Thermostat





AJ-80 Vision Series

Right to Left Operation Shown

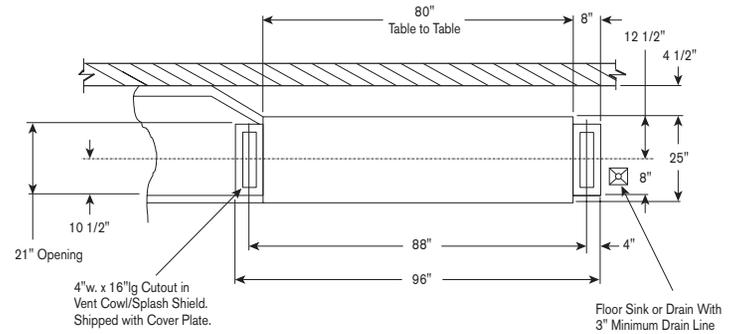
Legend to Drawing

- A** - Machine water inlet 3/4" I.P.S., 180°F Hi-temp, 140°F Low-temp minimum, 69 5/8" above finished floor
- B** - Electrical connection- See table for amperage requirements
- C** - Drain connection-1 1/2" I.P.S.
- D** - Vent collar 4"w. x 16"lg x 7"high- **Optional**
- E** - Vent collar standard
- F** - Incoming low pressure steam connection, 3/4" FPT (gate valve supplied)- **Optional**
- G** - Condensate return connection, 3/4" FPT (return to boiler feeder or open drain)
- H** - Prewash water inlet 3/4" I.P.S. 110°F- 140°F
- J** - Cold water thermostat plumbing connection 3/4" I.P.S.- **Optional**
- *Steam tank heat option only
- Note:** All vertical dimensions are +/- 1/2" from floor due to adjustable bullet feet

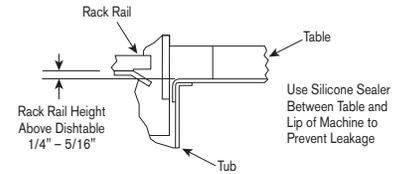
Approximate Total Load Amps

AJ-80 Series Electrical Data	Electric Tank Heat Models: AJ-80CE & AJ-80CEL		Steam Tank Heat Models: AJ-80CS & AJ-80CSL		Optional 36 KW Electric Booster Heater
	1-PH	3-PH	1-PH	3-PH	
208 Volts 60 Cycles	90.8	54.0	18.3	10.1	*95.9
230 Volts 60 Cycles	84.0	50.0	18.3	10.1	90.5
460 Volts 60 Cycles	N/A	24.4	N/A	5.1	45.2

*208 Volt 3-PH booster is derated from 36KW to 34.5KW
Note: Optional booster heater requires separate electrical connection



Recommended Table Fabrication



Note: Tub Will Accept a Table Flange Up to 24 7/8"

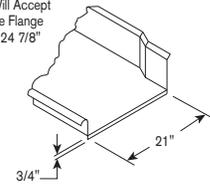
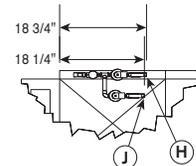
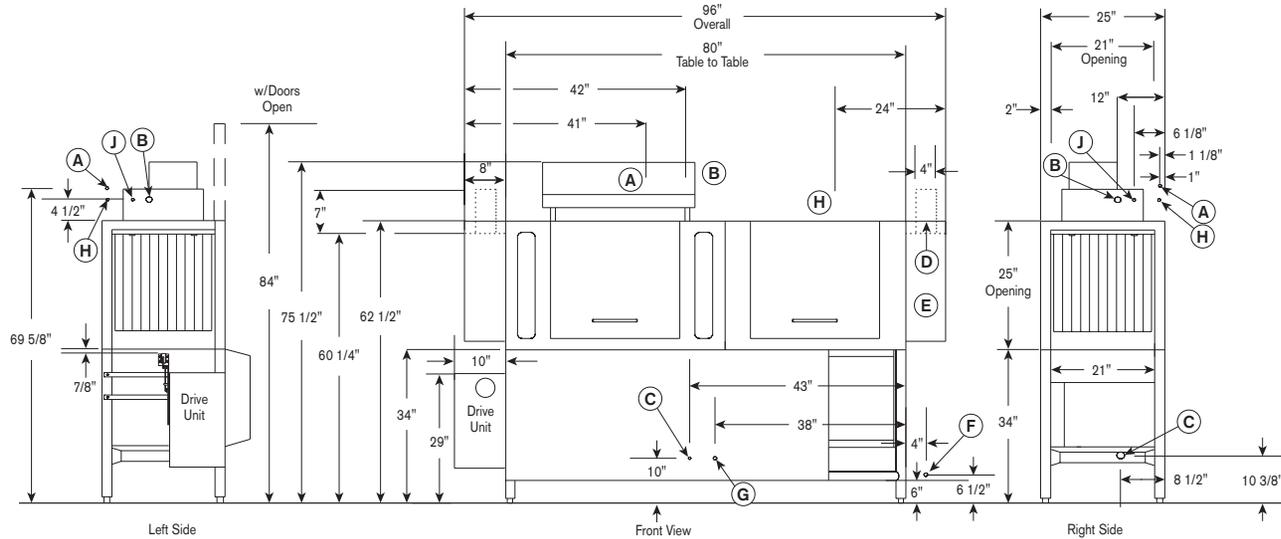


Table Turndown Flange 3/4" Max



Prewash Plan View Section With Cold Water Thermostat



1.0 SPECIFICATION INFORMATION

XL-HT Models

Performance/Capabilities

Operating Capacity:

Racks Per Hour (NSF Rated)	57
Racks Per Hour - Corner (NSF Rated)	55
Racks Per Hour - Vapor Vent	38

Operating Cycle (Seconds):

Wash Time	46
Rinse Time	10
Dwell Time	2
Total Cycle Time	63
Vent Time (Vapor Vent Only)	30
Total Cycle Time With Vapor Vent	93
Water Consumption per Cycle	0.83

Tank Capacity:

Wash Tank (Gal)	8
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Water Requirements:

Wash Temperature (Minimum)(°F)	150
Wash Temperature (Minimum XL-HTHH) (°F)	155
Wash Temperature (Recommended)(°F)	160
Rinse Temperature (Minimum)(°F)	180-195
Rinse Temperature (Recommended)(°F)	185
Inlet Water Temperature (Minimum)(°F)	110
Gallons per Hour	52.5
Flow Pressure (PSI)	20 ± 5
Hot Water Line Size (IPS)	1/2"
Cold Water Line Size (IPS) (Vapor Vent Only)	3/8"
Drain Line Size (IPS)	1-1/2"

Frame Dimensions

Width	25 1/4"
Depth	25 1/4"
Height	70 3/4"
Height XL-HTHH	81"
Standard Table Height	34"
Maximum Clearance	17"
Maximum Clearance XL-HTHH	27"

Electrical Requirements

Wash Pump Motor Horsepower	3/4
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Electrical Requirements

<p>NOTE</p> 	<p>Typical Electrical Circuit is based upon (1) full amperage load of the machine plus 25% of the wash pump amperage load and (2) typical fixed-trip circuit breaker sizes as listed in the NEC 2008 Edition. Local codes may require more stringent protection than what is displayed here. Always verify with your electrical service contractor that your circuit protection is adequate and meets all applicable national and local codes. These numbers are provided in this manual simply for reference and may change without notice at any given time.</p>
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SINGLE POWER SUPPLY ELECTRICAL CONNECTION

VOLTS	PH	HZ	Rinse Heater Ratings	Total Amps	Typical Electrical Circuit
208*	1	60	10.6kW@208V	84.0	90
208*	3	60	10.6kW@208V	51.7	60
240*	1	60	14kW@240V	94.7	110
240*	3	60	14kW@240V	57.7	70
480	3	60	15.2kW@480V	29.7	40

<p>* NOTE</p> 	<p>The 240VAC machine is also rated for connection to 208VAC service. When the 240VAC machine is installed on a 208VAC service the heating elements are derated. The wash heating element is derated to 5.2kW and the rinse is derated to 10.6kW. The operating cycle and water requirements are the same for both 240VAC and 208VAC service.</p>
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DUAL POWER SUPPLY ELECTRICAL CONNECTION

(Separate circuits for booster heater and for machine)

VOLTS	PH	HZ	Rinse Heater Ratings	Booster Amps	Booster		Machine	
					Typical Electrical Circuit	Machine Amps	Typical Electrical Circuit	
208*	1	60	10.6kW@208V	51.0	60	33.0	40	
208*	3	60	10.6kW@208V	29.4	35	22.3	30	
240*	1	60	14kW@240V	58.3	70	36.4	45	
240*	3	60	14kW@240V	33.7	40	24.0	35	
480	3	60	15.2kW@480V	18.3	25	11.4	15	

<p>NOTE</p> 	<p>Always refer to the machine data plate for specific electrical and water requirements. The material provided on this page is for reference only and may be subject to change without notice.</p>
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XL-RW Models

Performance/Capabilities

Operating Capacity:

Racks Per Hour (NSF Rated)	57
Racks Per Hour - Corner (NSF Rated)	55
Racks Per Hour - Vapor Vent	38

Operating Cycle (Seconds):

Wash Time	46
Rinse Time	10
Dwell Time	2
Total Cycle Time	63
Vent Time (Vapor Vent Only)	30
Total Cycle Time With Vapor Vent	93
Water Consumption per Cycle	0.83

Tank Capacity:

Wash Tank (Gal)	8
-----------------	---

Water Requirements:

Wash Temperature (Minimum)(°F)	120
Rinse Temperature (Minimum)(°F)	120
Chlorine Required (Minimum) (ppm)	50
Inlet Water Temperature (Minimum)(°F)	90
Gallons per Hour	52.5
Flow Pressure (PSI)	20 ± 5
Hot Water Line Size (IPS)	1/2"
Cold Water Line Size (IPS) (Vapor Vent Only)	3/8"
Drain Line Size (IPS)	1-1/2"

Frame Dimensions

Width	25 1/4"
Depth	25 1/4"
Height	70 3/4"
Height XL-RWHH	81"
Standard Table Height	34"
Maximum Clearance	17"
Maximum Clearance XL-RWHH	27"

Electrical Requirements

Wash Pump Motor Horsepower	1
----------------------------	---

Electrical Requirements

NOTE 	Typical Electrical Circuit is based upon (1) full amperage load of the machine plus 25% of the wash pump amperage load and (2) typical fixed-trip circuit breaker sizes as listed in the NEC 2008 Edition. Local codes may require more stringent protection than what is displayed here. Always verify with your electrical service contractor that your circuit protection is adequate and meets all applicable national and local codes. These numbers are provided in this manual simply for reference and may change without notice at any given time.
--	---

SINGLE POWER SUPPLY ELECTRICAL CONNECTION

VOLTS	PH	HZ	Rinse Heater Ratings	Total Amps	Typical Electrical Circuit
208*	1	60	4.1kW@208V	27.0	35
208*	3	60	4.1 kW@208V	18.7	25
240*	1	60	5.45kW@240V	30.2	40
240*	3	60	5.45kW@240V	20.5	30

* NOTE 	The 240VAC machine is also rated for connection to 208VAC service. When the 240VAC machine is installed on a 208VAC service the heating elements are derated. Both the wash and rinse heating elements are derated to 4.1kW. The operating cycle and water requirements are the same for both 240VAC and 208VAC service.
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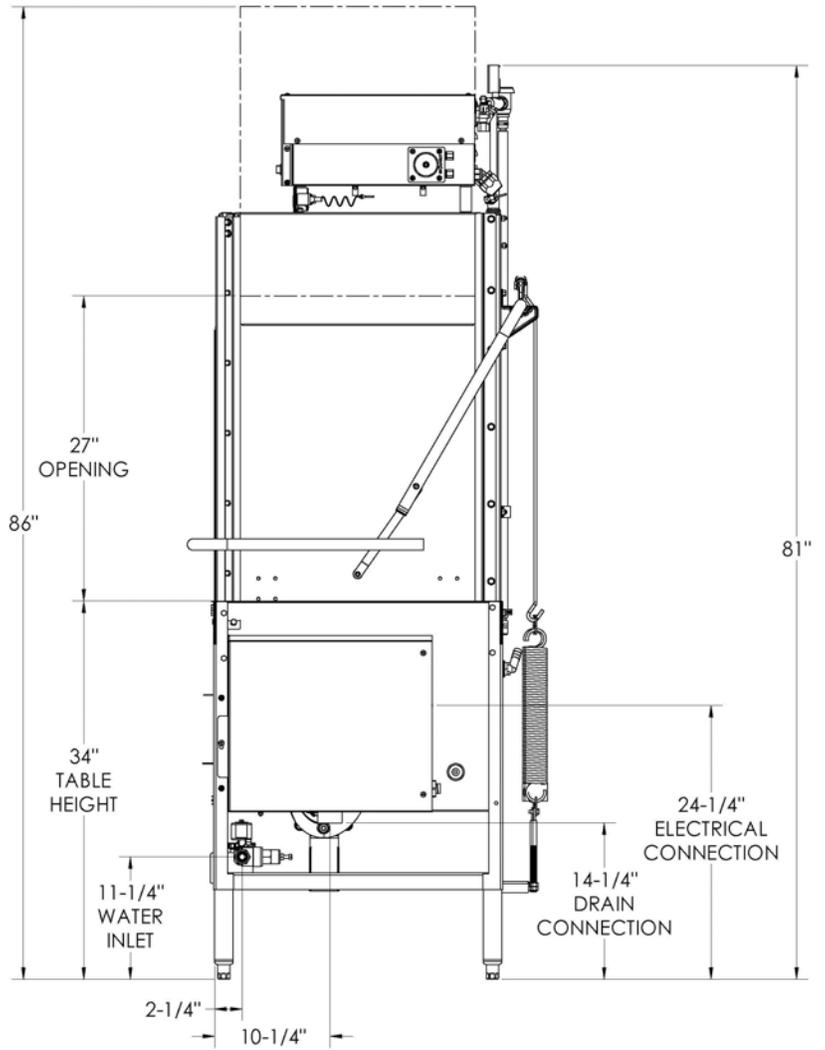
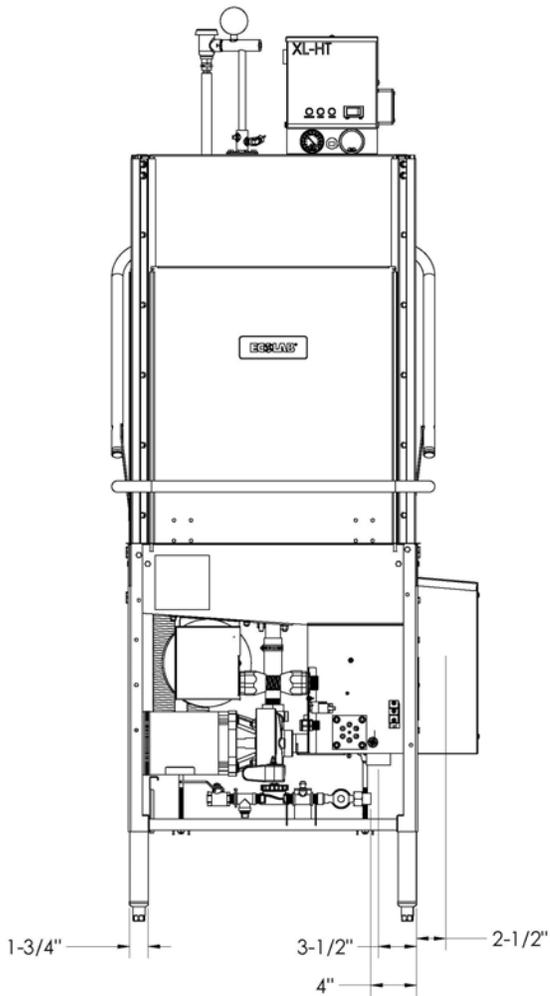
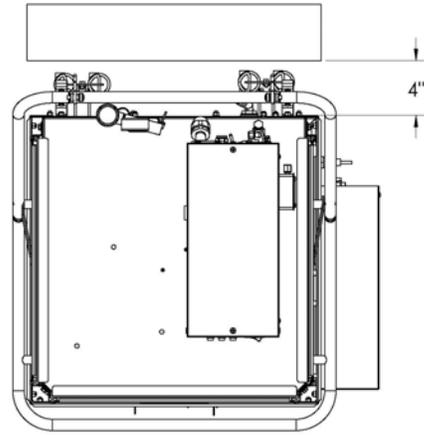
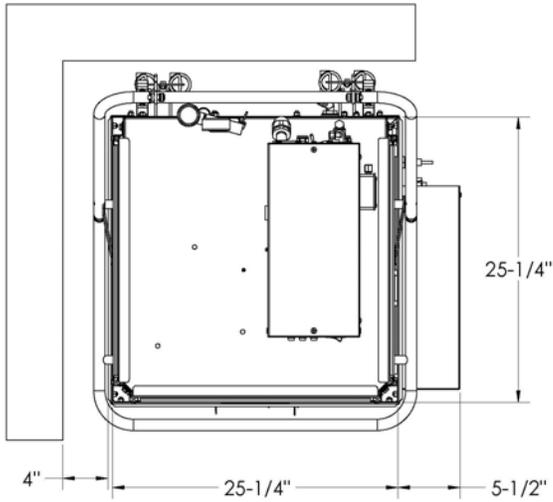
DUAL POWER SUPPLY ELECTRICAL CONNECTION

(Separate circuits for booster heater and for machine - Remove interlock from wash and rinse heater if using dual power supply)

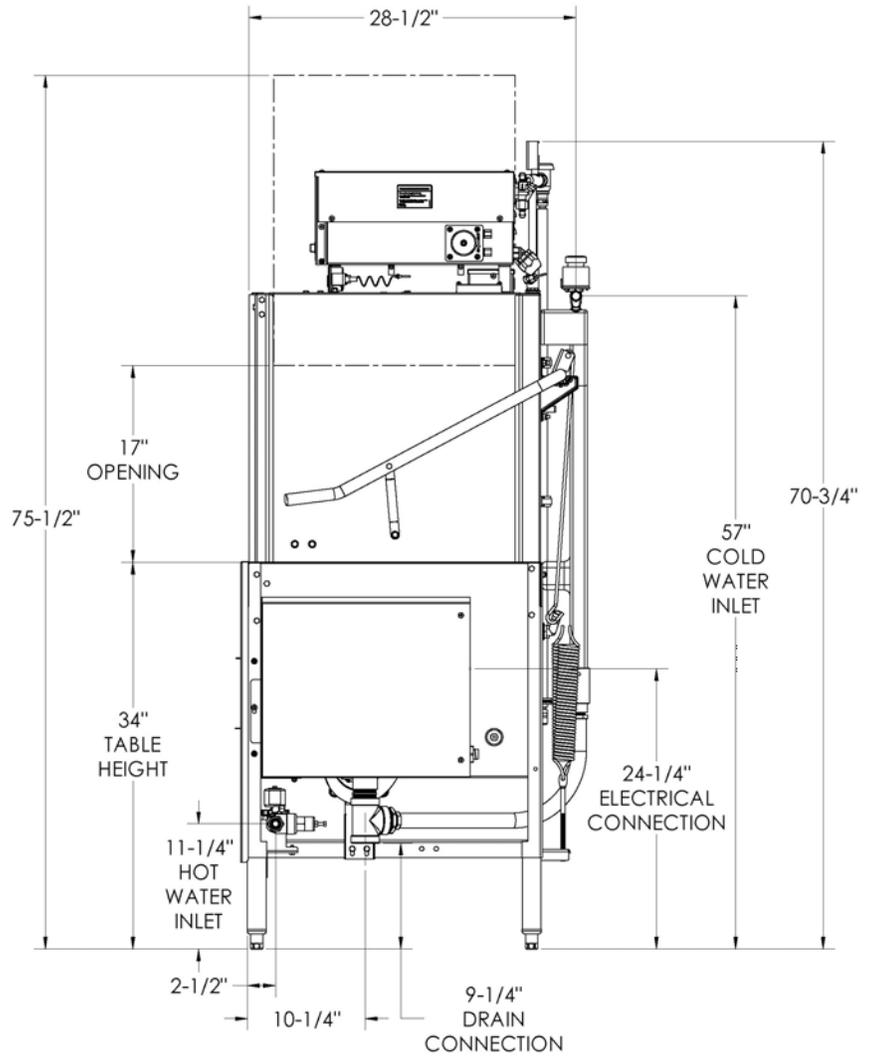
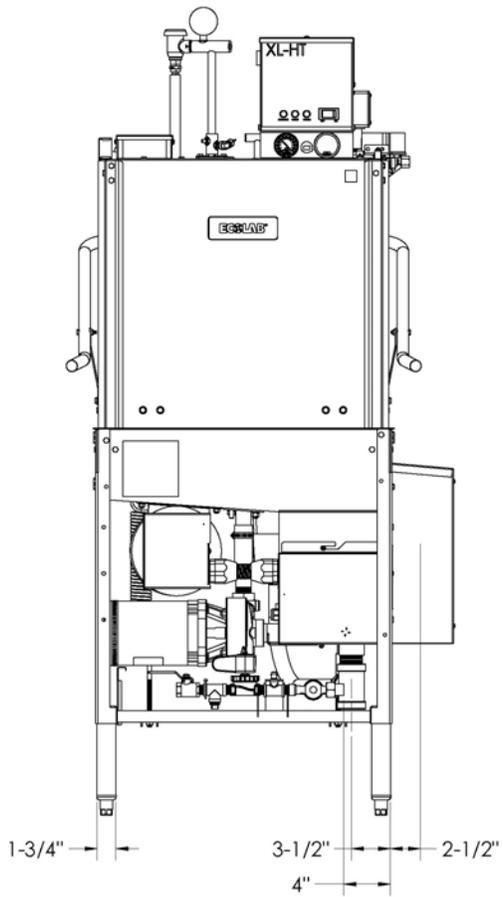
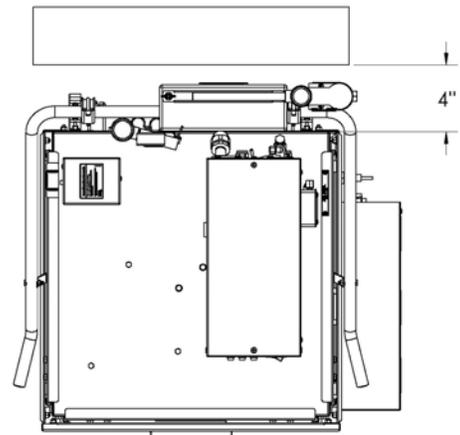
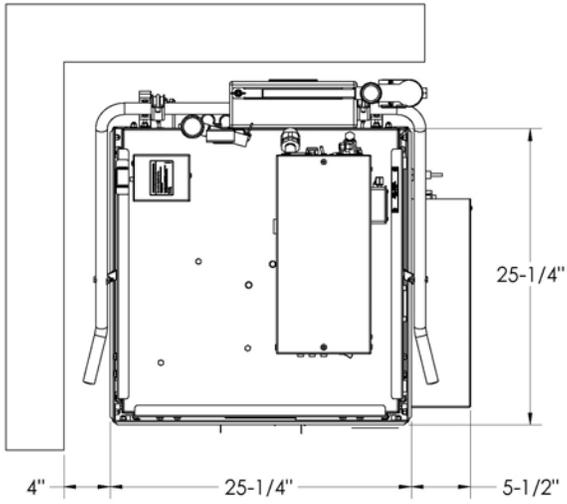
VOLTS	PH	HZ	Rinse Heater Ratings	Booster Amps	Booster Typical Electrical Circuit	Machine Amps	Machine Typical Electrical Circuit
208*	1	60	4.1kW@208V	19.7	25	27.0	35
208*	3	60	4.1kW@208V	11.4	15	18.7	25
240*	1	60	5.45kW@240V	22.9	30	30.2	40
240*	3	60	5.45kW@240V	13.2	20	20.5	30

NOTE 	Always refer to the machine data plate for specific electrical and water requirements. The material provided on this page is for reference only and may be subject to change without notice.
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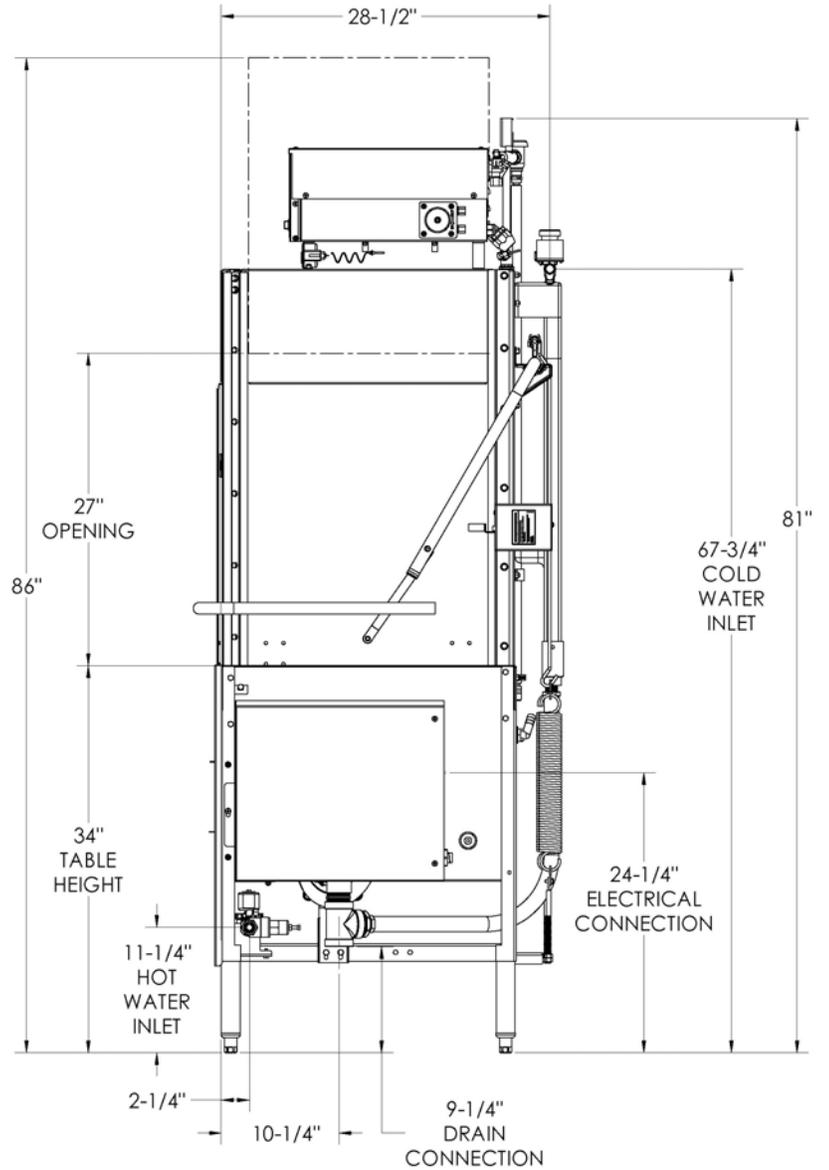
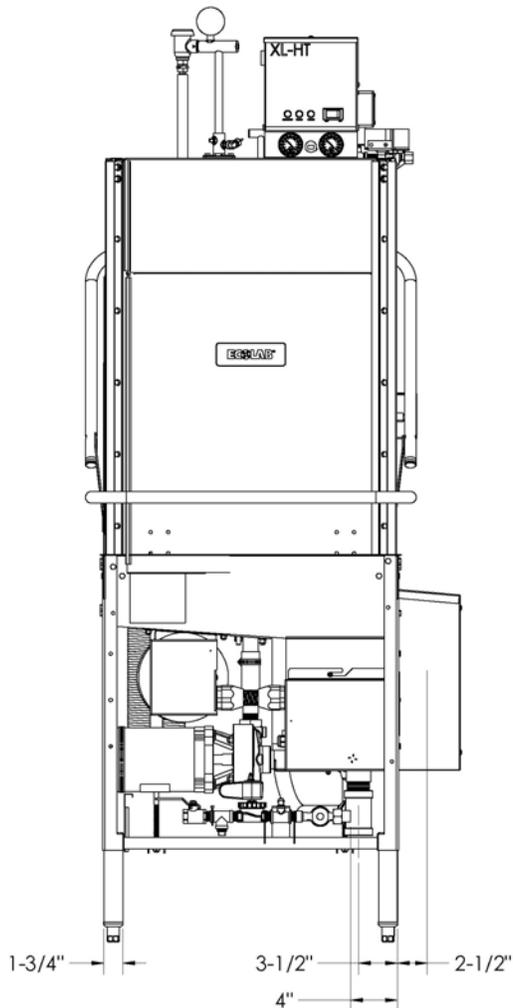
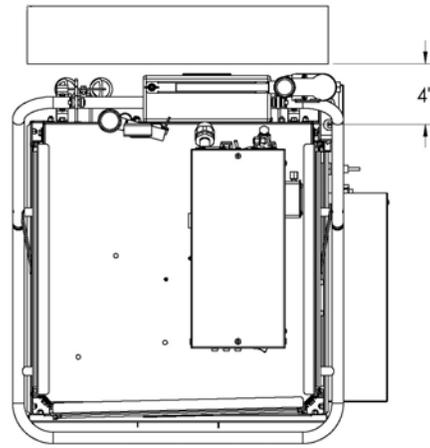
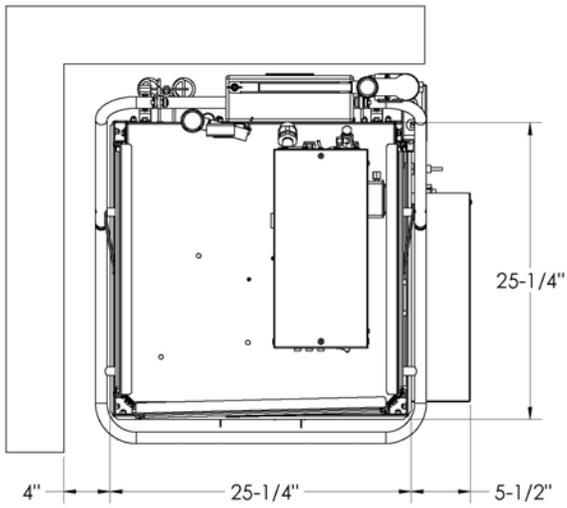
XL-HTHH/XL-RWHH DIMENSIONS

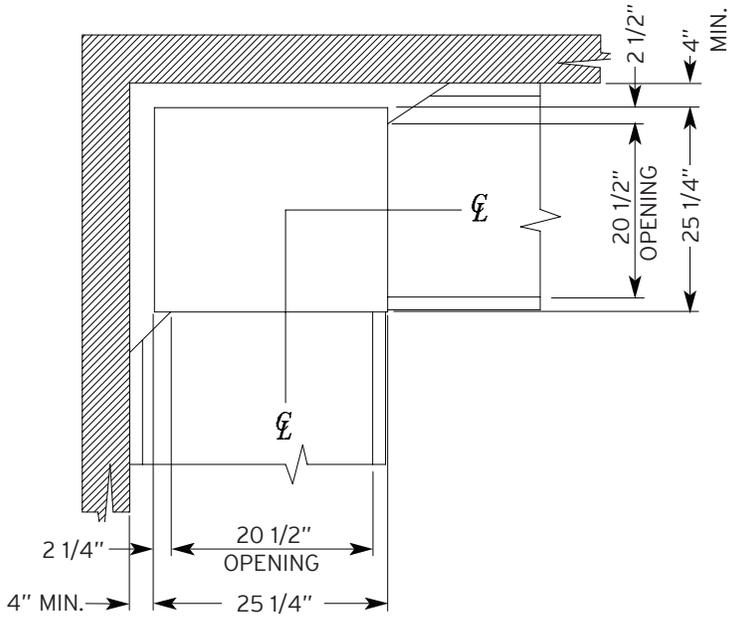


XL-HT VV/XL-RW VV DIMENSIONS

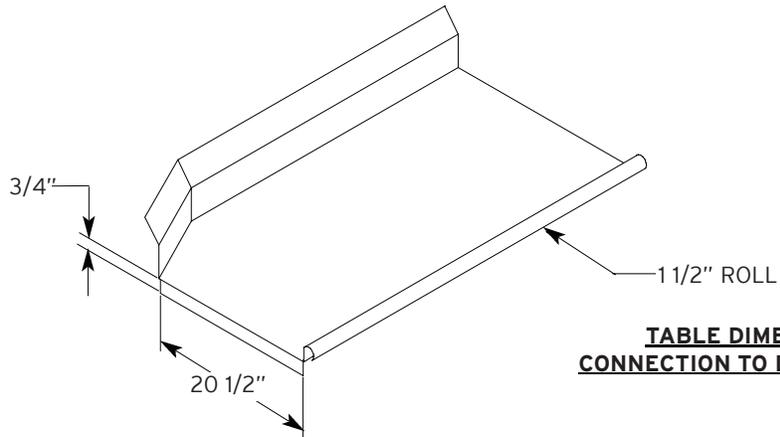


XL-HTHH VV/XL-RWHH VV DIMENSIONS

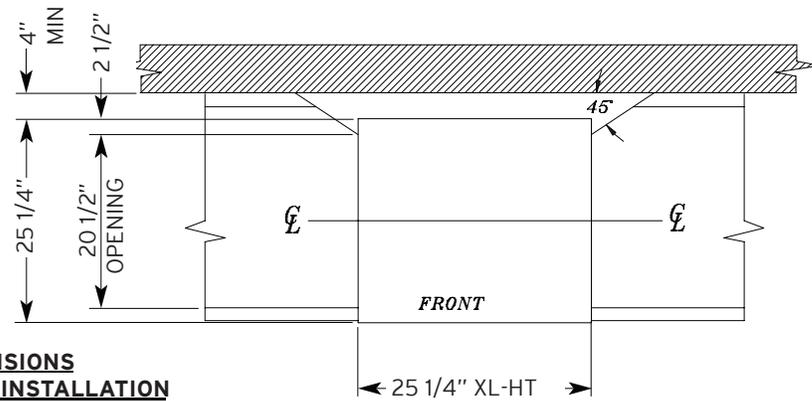




**TABLE DIMENSIONS
CORNER INSTALLATION**



**TABLE DIMENSIONS
CONNECTION TO DISHMACHINE**



**TABLE DIMENSIONS
STRAIGHT THROUGH INSTALLATION**



EC-LW SERIES CONVEYORS

SCAN FOR MORE INFO ON
ECOLABSALESSUPPORT.COM



Installation and Operation Manual

Retain this manual for installation, operation, and servicing information.

1 Ecolab Place, St. Paul, MN 55102
www.ecolab.com

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55138/5400/0120
Part No. 53001996



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NOMENCLATURE FOR THE MODELS COVERED IN THIS MANUAL

EC44-LW
EC44HH-LW
EC66-LW
EC66HH-LW

EXPLANATION:

EC - 66 - HH - LW

I II III IV

I - EC Series.

II - Machine length, in.

44 denotes 44 in.

66 denotes 66 in.

(44 in. wash/rinse section plus 22 in. prewash section).

III - Hood Height

HH - Denotes High Hood

No suffix denotes standard hood height

III - Hood Height

HH - Denotes High Hood

No suffix denotes standard hood height

IV - Water Usage

LW - Denotes Low Water

No Suffix denotes standard water usage

Model:

Serial No.:

Installation Date:

Service Rep. Name:

Phone No.:

1.0 Specification Information

RACKS PER HOUR:

ALL MODELS 244

CAPACITIES:

EC44-LW/EC44HH-LW WASH TANK (GALS)	20
EC44-LW/EC44HH-LW WASH PUMP (GPM)	270
EC66-LW/EC66HH-LW WASH TANK (GALS)	20
EC66-LW/EC66HH-LW WASH PUMP (GPM)	270
EC66-LW/EC66HH-LW PREWASH TANK (GALS)	16
EC66-LW/EC66HH-LW PREWASH PUMP (GPM)	120

CONVEYOR SPEED:

ALL MODELS 6.8FPM

GALLONS PER RACK:

EC Low Water 0.62

WATER REQUIREMENTS (ALL MODELS):

WASH TEMPERATURE (hot water sanitizing)	160°F
WASH TEMPERATURE (chemical sanitizing)	140°F
RINSE TEMPERATURE (hot water sanitizing)	180°F
RINSE TEMPERATURE (chemical sanitizing)	120°F
FLOW PRESSURE (PSI)	20±5
FLOWRATE (GPM) EC-LW	2.51

NOTE: Temperatures listed are minimums.

SANITIZER REQUIREMENTS:

All Models in Chemical Sanitizing Mode 50PPM

VENTING REQUIREMENTS (all models):

INPUT END (CFM)	200
OUTPUT END (CFM)	400
TOTAL (CFM)	600

NOTE: For ventilation systems that connect directly to the conveyor, it is recommended to use baffled ventilation scoops to allow better control of the airflow out of the machine as well as a timing circuit for the exhaust fan to minimize the amount of time the fan runs with an idle dishmachine. Parts information for ventilation scoops and the exhaust fan timer kit can be found in this manual.

MOTOR ELECTRICAL REQUIREMENTS:

DRIVE MOTOR HP	1/4
PREWASH MOTOR HP (66" MACHINES ONLY)	1
WASH MOTOR HP	2

NOTE: Typical Electrical Circuit is based upon (1) full amperage load of the machine plus 25% of the wash pump amperage load and (2) typical fixed-trip circuit breaker sizes as listed in the NEC 2008 Edition. Local codes may require more stringent protection than what is displayed here. Always verify with your electrical service contractor that your circuit protection is adequate and meets all applicable national and local codes. These numbers are provided in this manual simply for reference and may change without notice at any given time.

EC44-LW/EC44HH-LW ELECTRICAL REQUIREMENTS:

			WASH HEATER RATINGS	TOTAL AMPS	TYPICAL ELECTRICAL CIRCUIT
VOLTS	PH	HZ			
208V	1	60	15KW@208V	82.65 A	90 AMP
230V	1	60	15KW@230V	75.85 A	80 AMP
208V	3	60	15KW@208V	48.75 A	60 AMP
230V	3	60	15KW@230V	44.6 A	50 AMP
460V	3	60	15KW@460V	22.3 A	25 AMP

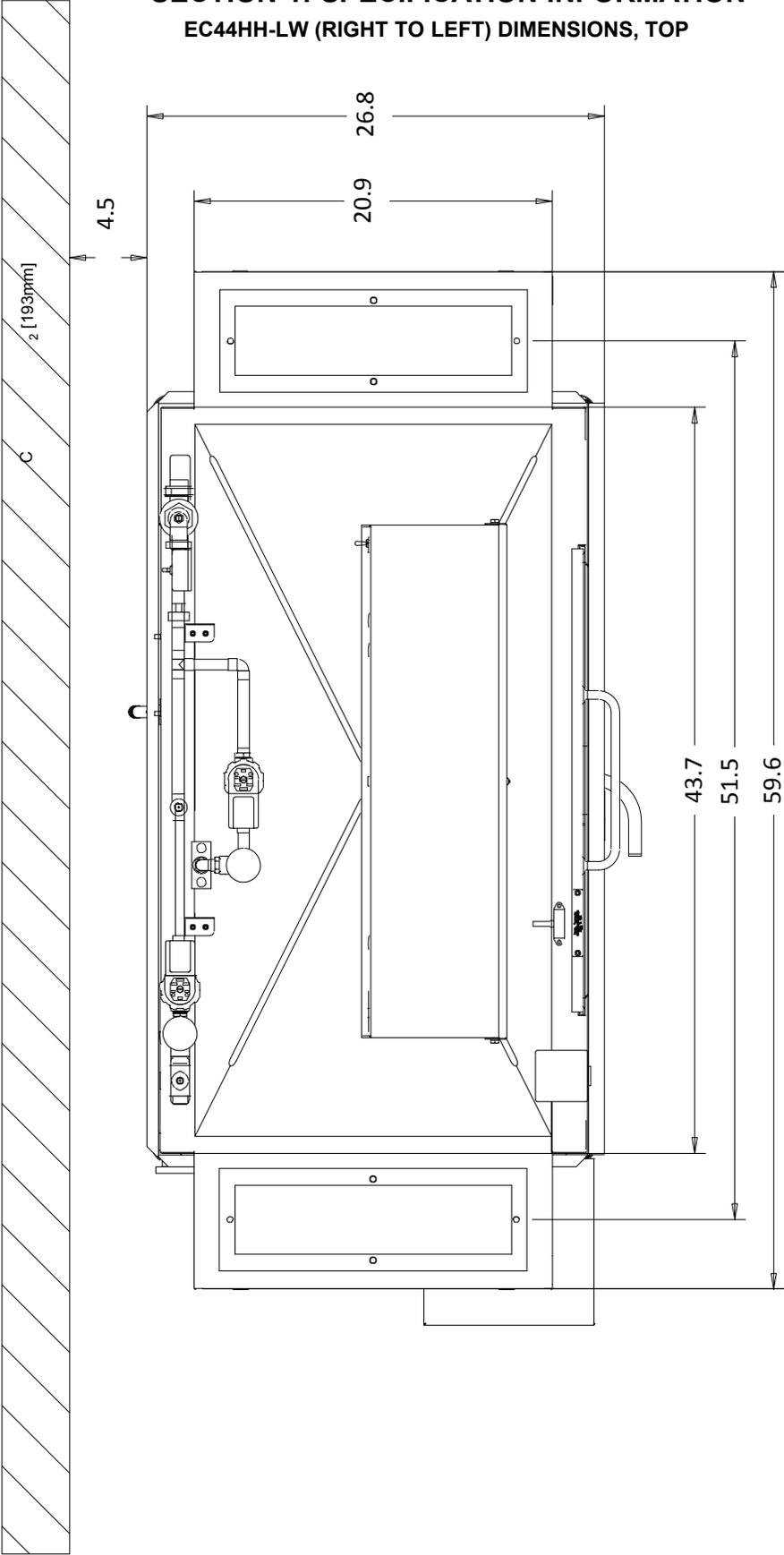
EC66-LW/EC66HH-LW ELECTRICAL REQUIREMENTS:

			WASH HEATER RATINGS	TOTAL AMPS	TYPICAL ELECTRICAL CIRCUIT
VOLTS	PH	HZ			
208V	1	60	15KW@208V	88.65 A	100 AMP
230V	1	60	15KW@230V	81.85 A	90 AMP
208V	3	60	15KW@208V	52.15 A	60 AMP
230V	3	60	15KW@230V	48.0 A	60 AMP
460V	3	60	15KW@460V	24.1 A	30 AMP

NOTE: Always refer to the machine data plate for specific electrical and water requirements. The material provided on this page is for reference only and may be subject to change without notice.

SECTION 1: SPECIFICATION INFORMATION

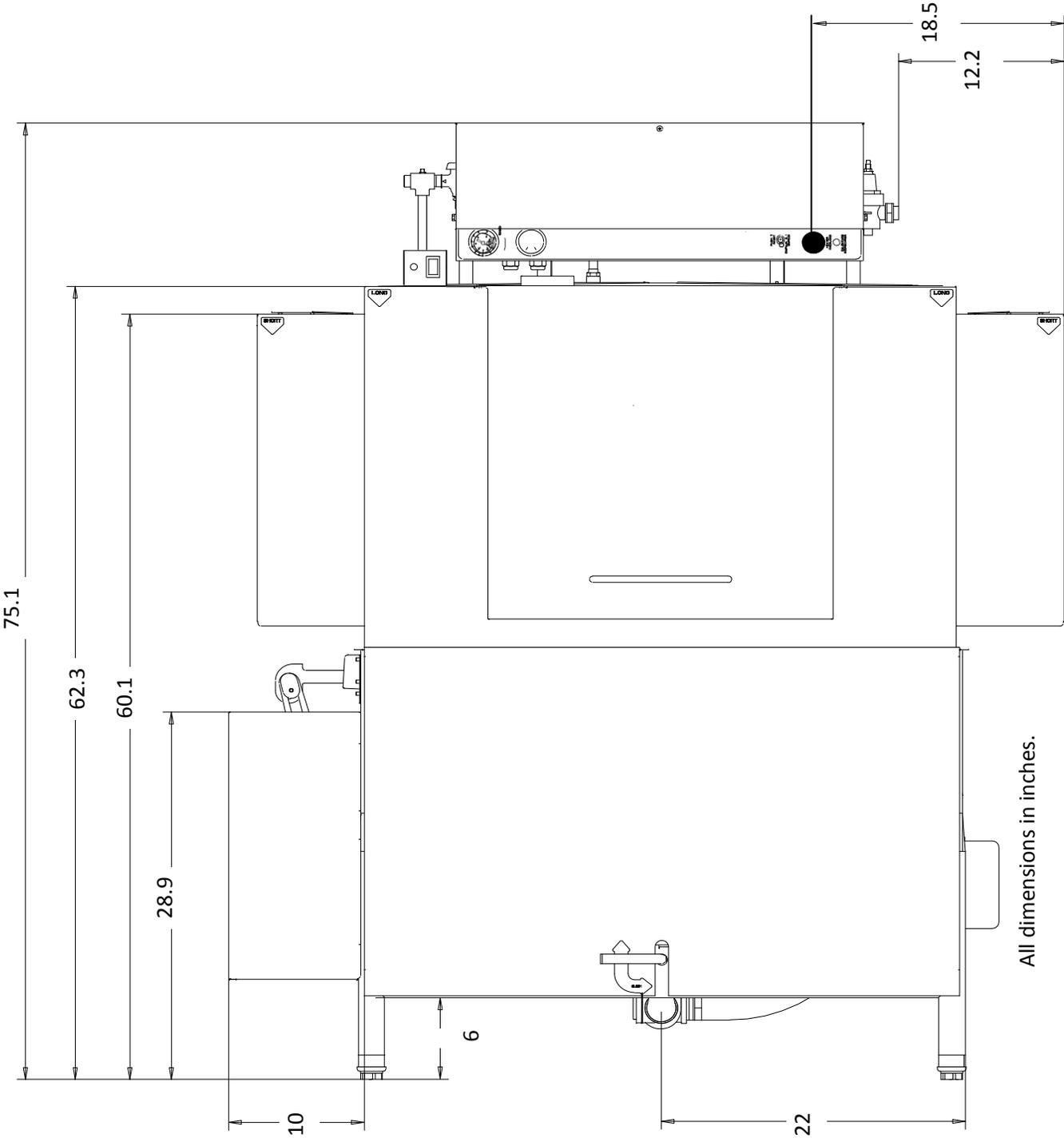
EC44HH-LW (RIGHT TO LEFT) DIMENSIONS, TOP



All dimensions in inches.

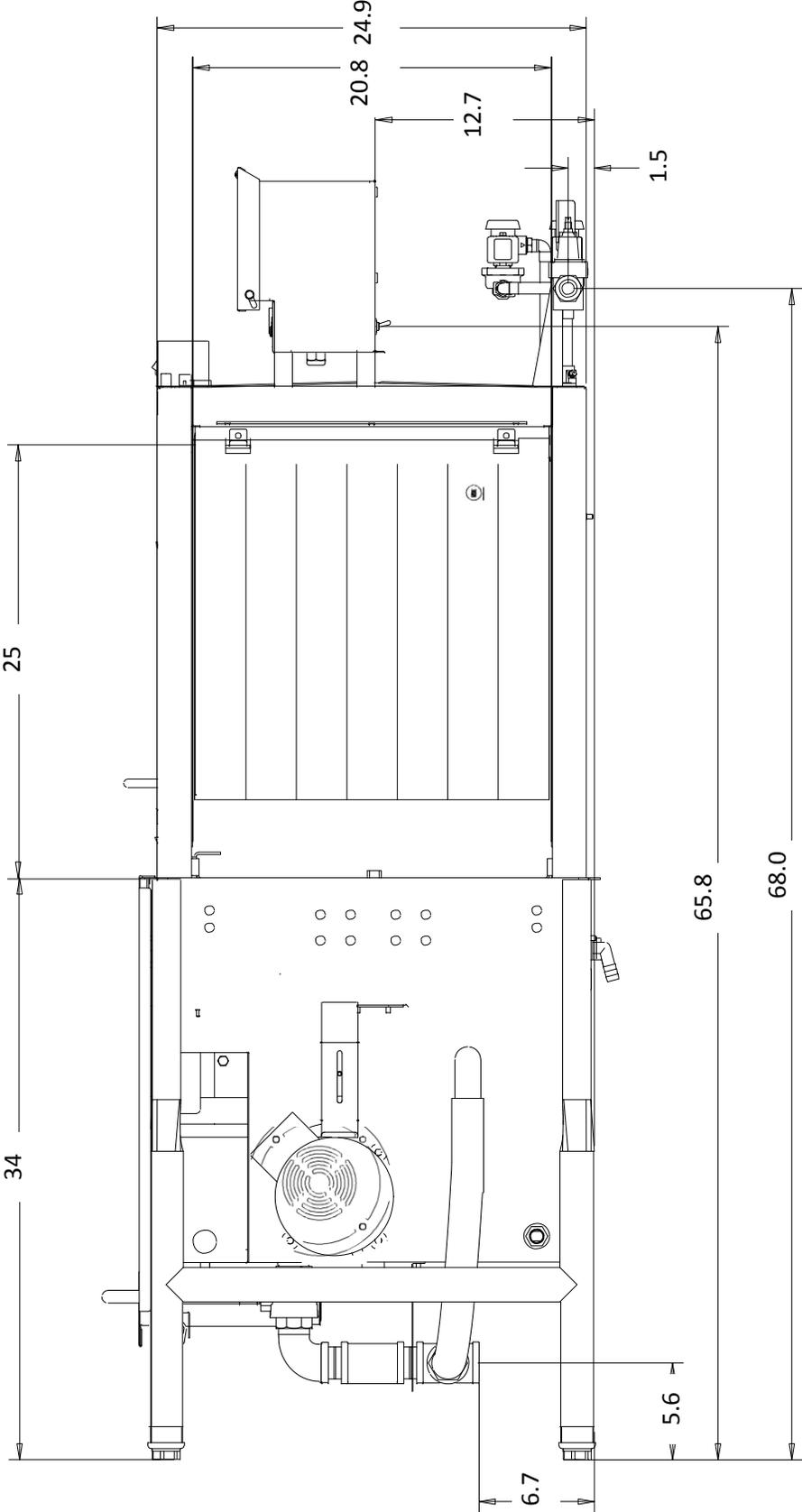
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EC44HH-LW (RIGHT TO LEFT) DIMENSIONS, FRONT



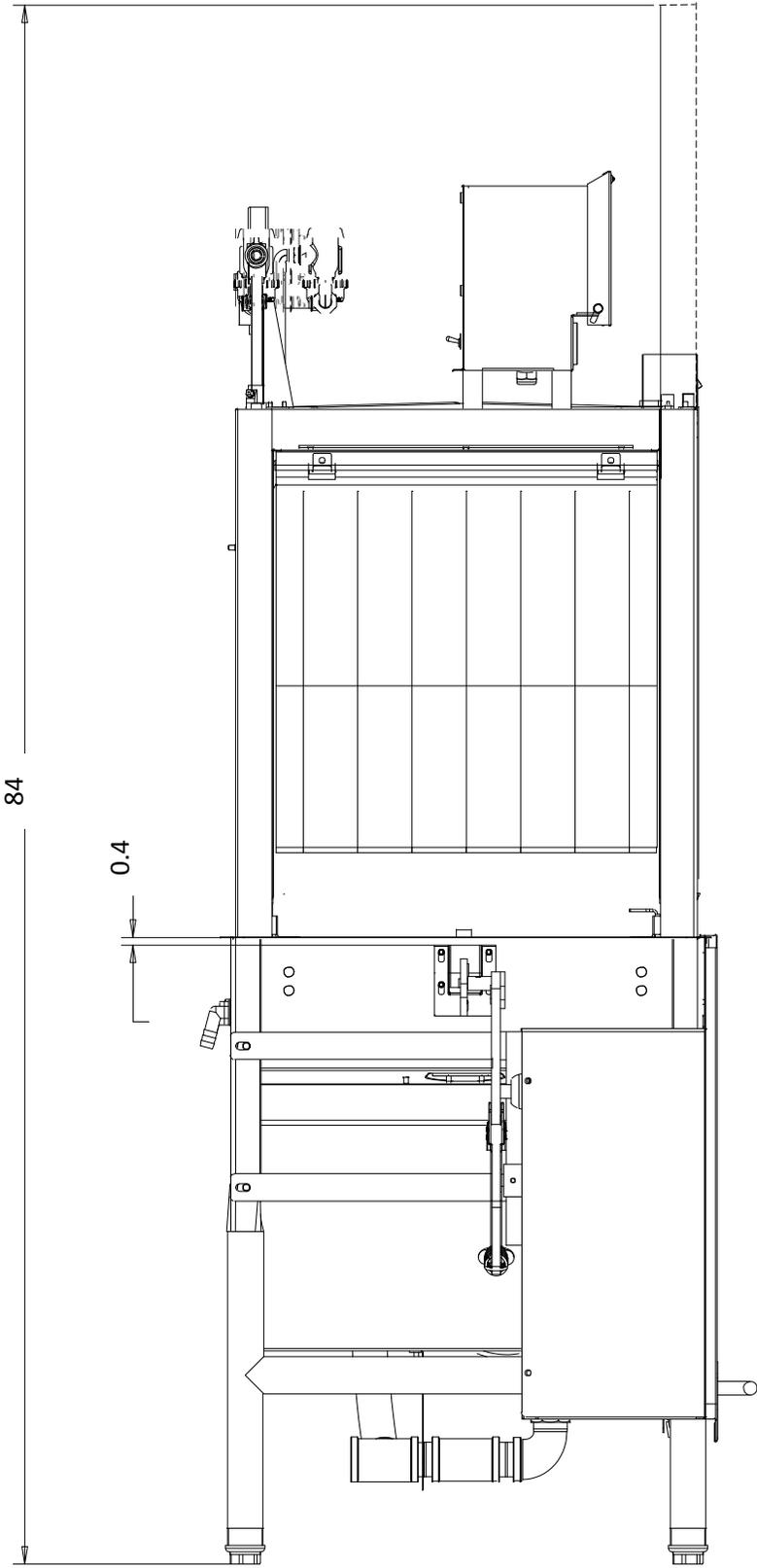
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EC44HH-LW (RIGHT TO LEFT) DIMENSIONS, RIGHT SIDE



All dimensions in inches.

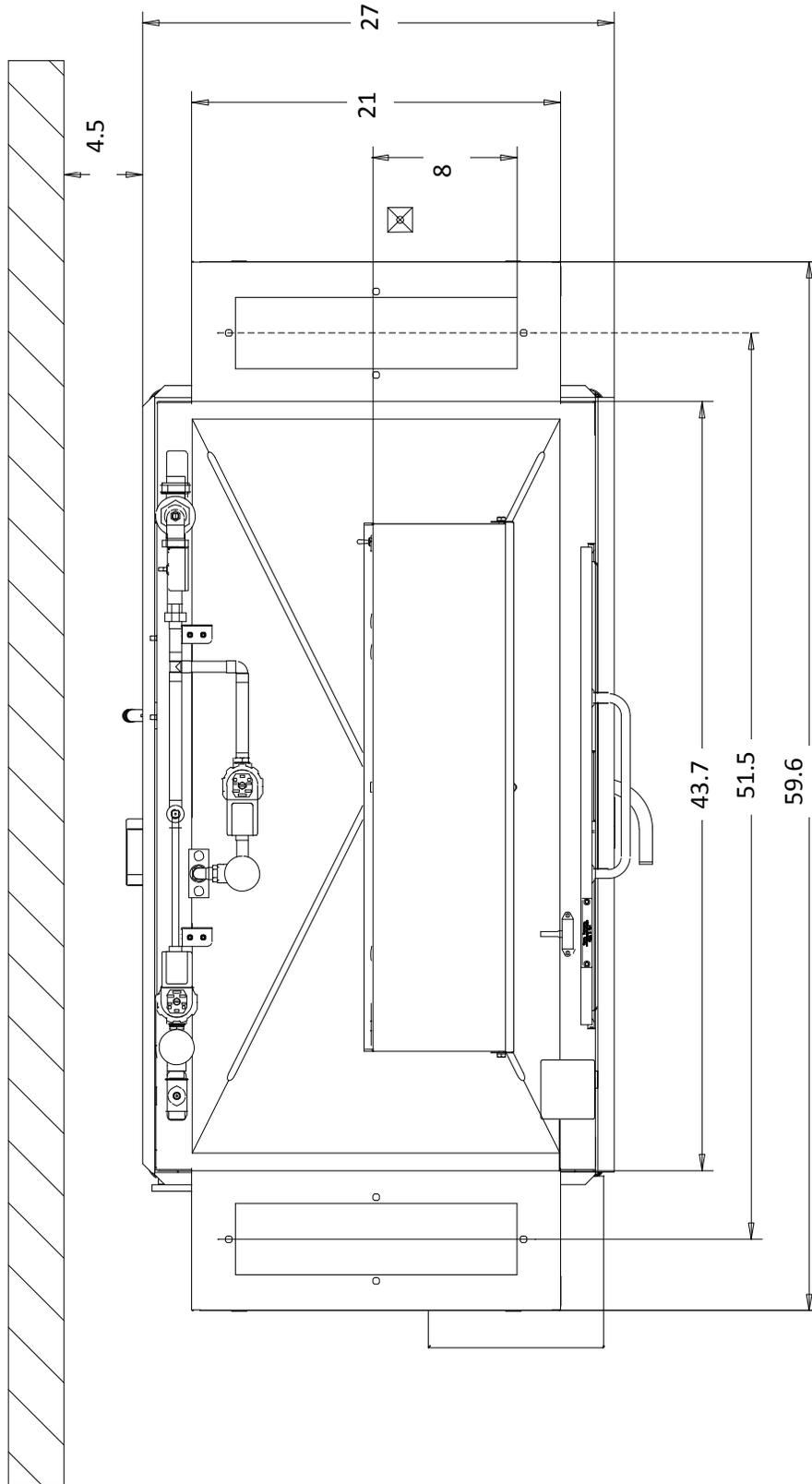
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EC-44HH (RIGHT TO LEFT) DIMENSIONS, LEFT SIDE



All dimensions in inches.

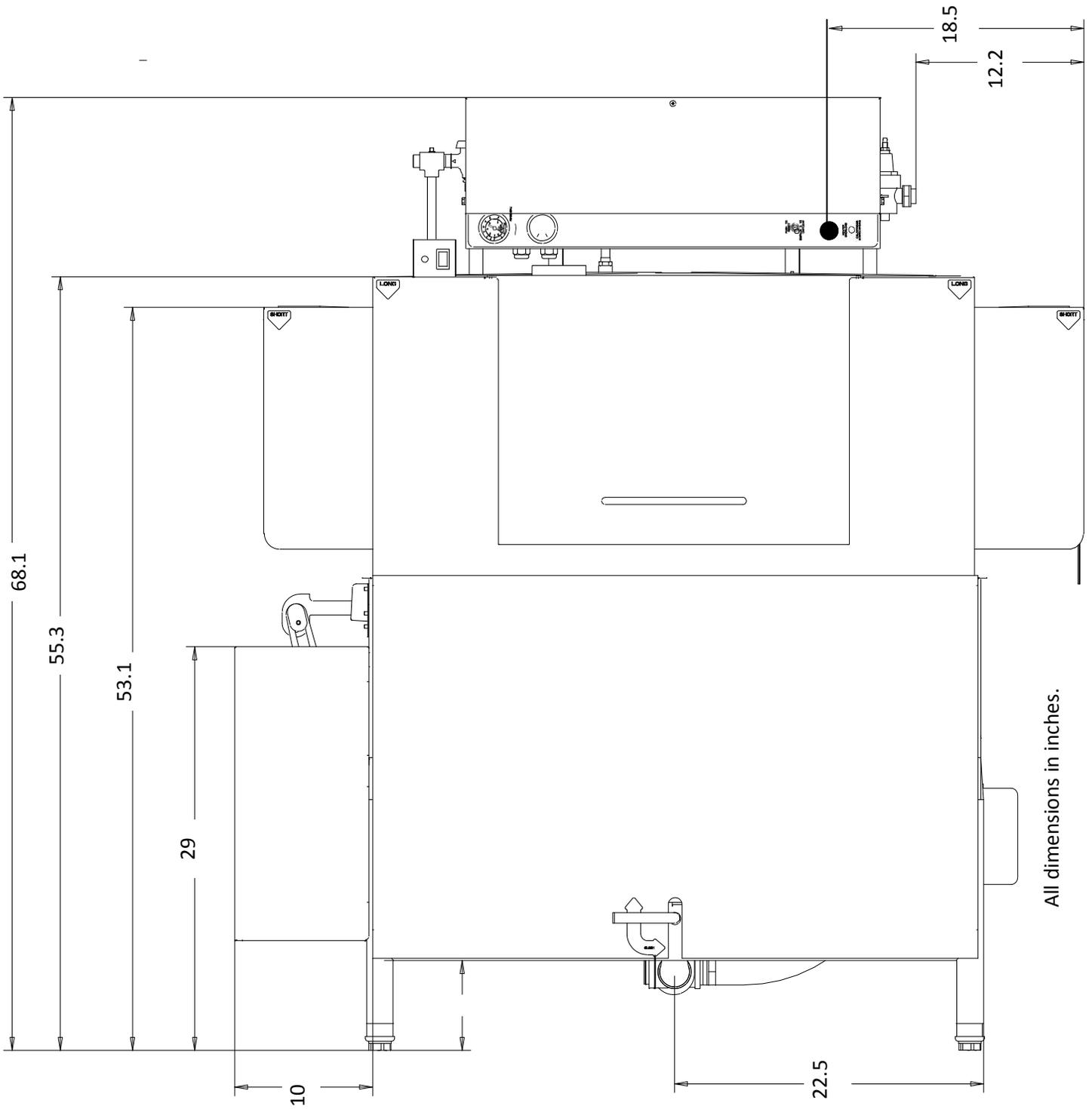
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EC44-LW (RIGHT TO LEFT) DIMENSIONS, TOP



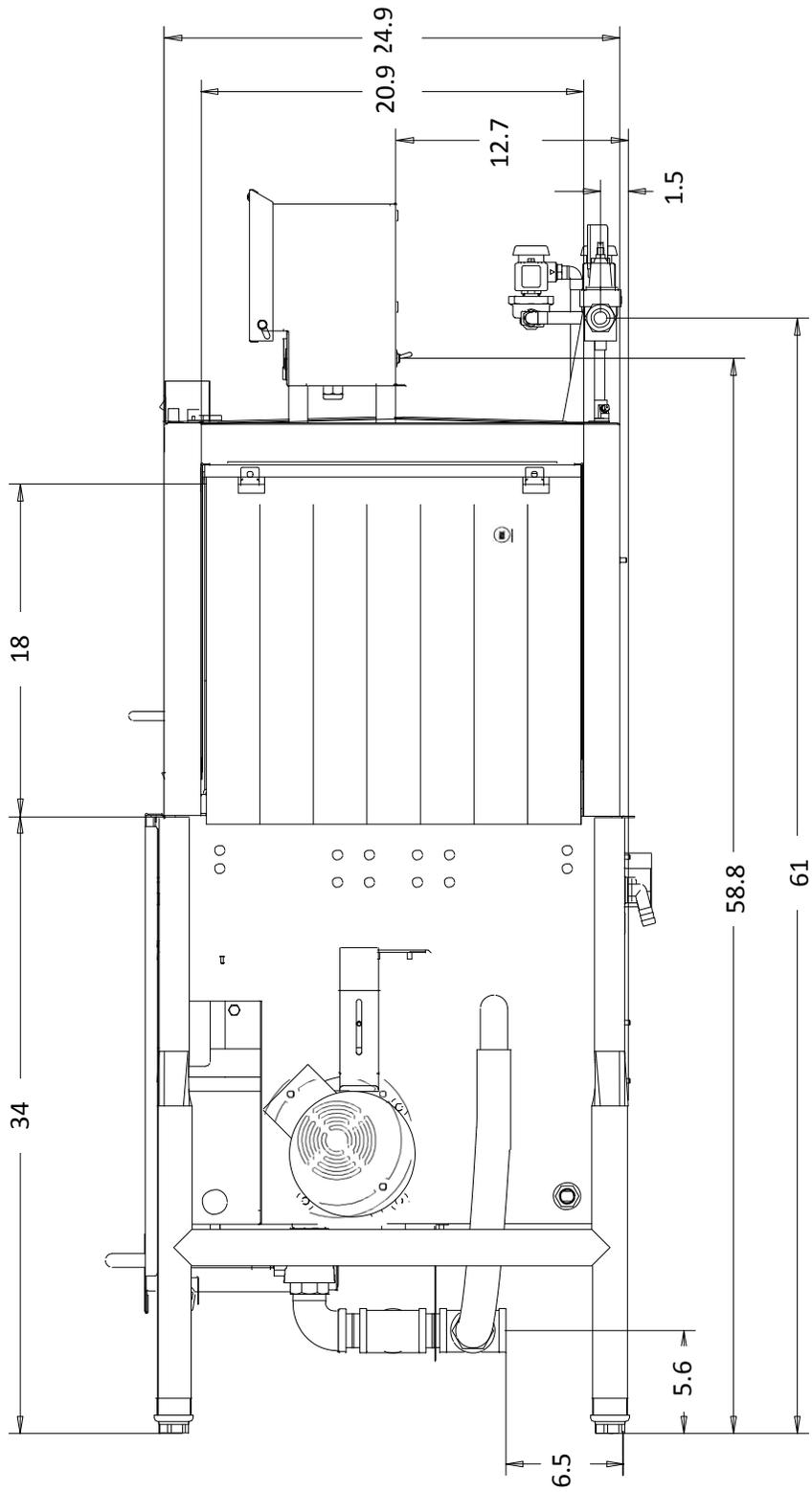
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EC44-LW (RIGHT TO LEFT) DIMENSIONS, FRONT



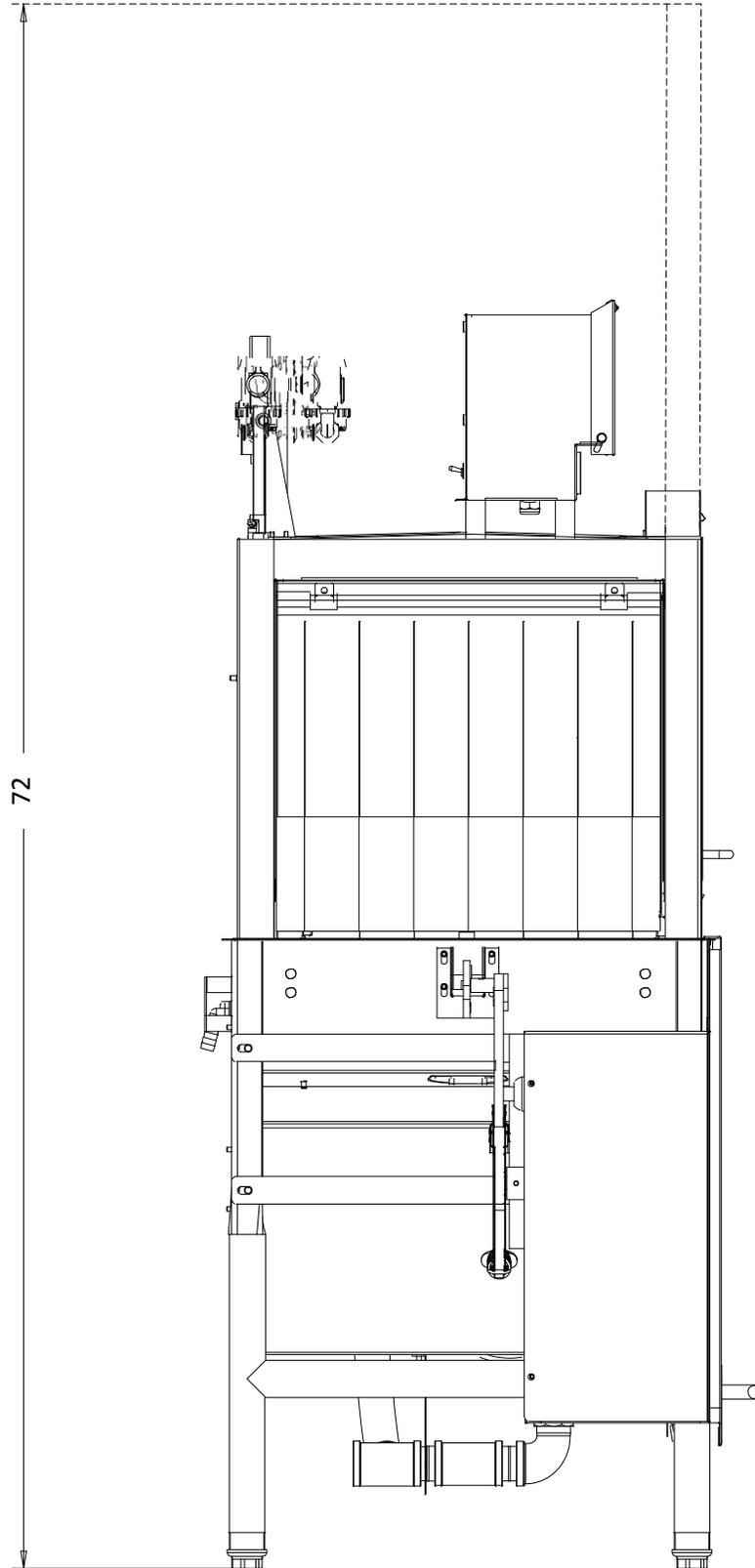
SECTION 1: SPECIFICATION INFORMATION

EC44-LW (RIGHT TO LEFT) DIMENSIONS, RIGHT SIDE



All dimensions in inches.

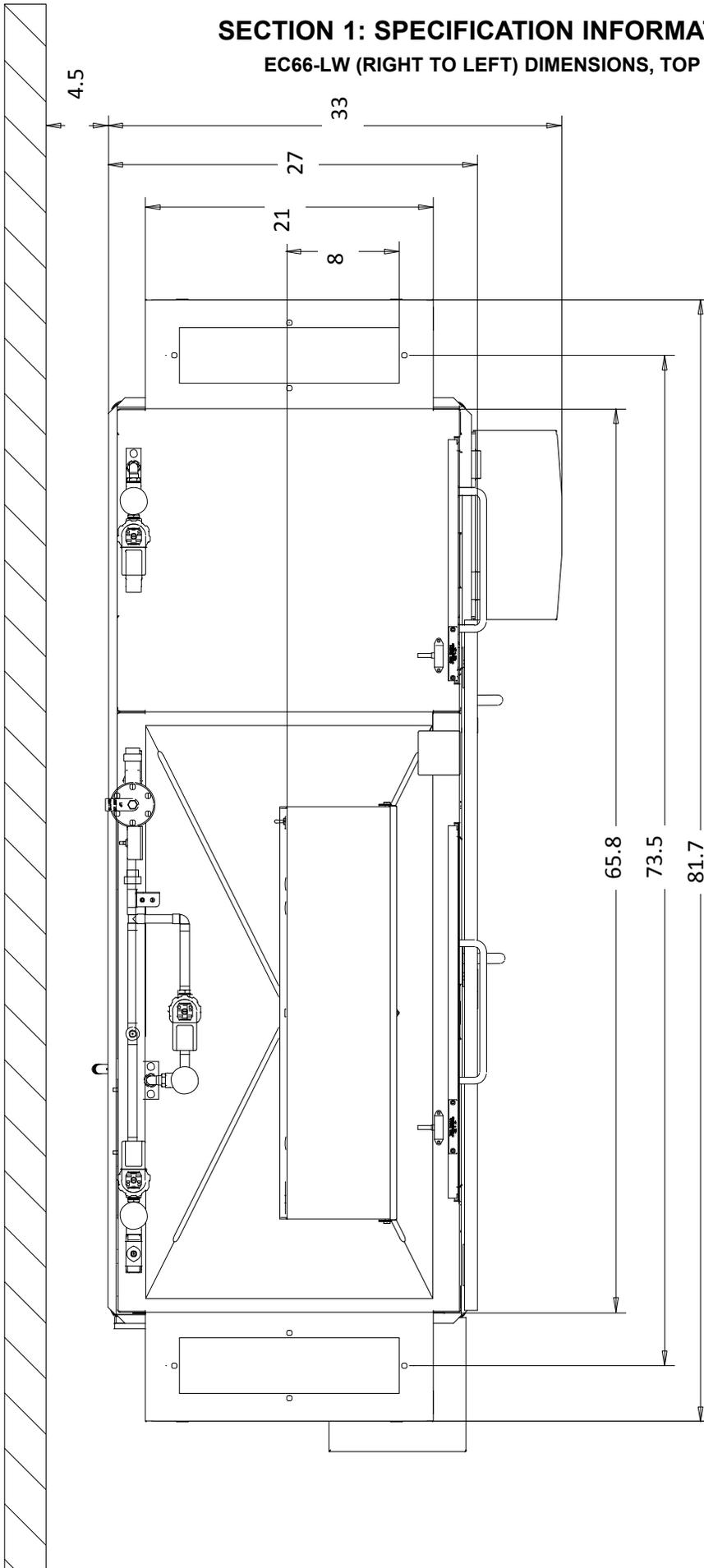
SECTION 1: SPECIFICATION INFORMATION
EC44-LW (RIGHT TO LEFT) DIMENSIONS, LEFT SIDE



All dimensions in inches.

SECTION 1: SPECIFICATION INFORMATION

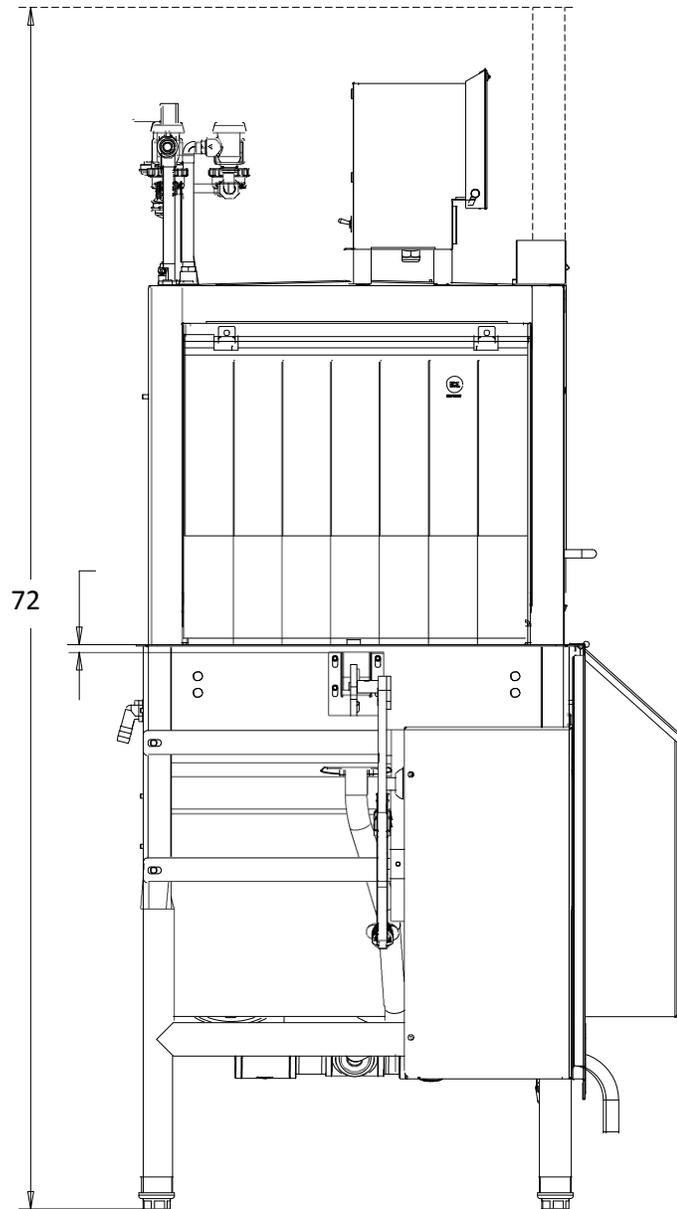
EC66-LW (RIGHT TO LEFT) DIMENSIONS, TOP



All dimensions in inches.

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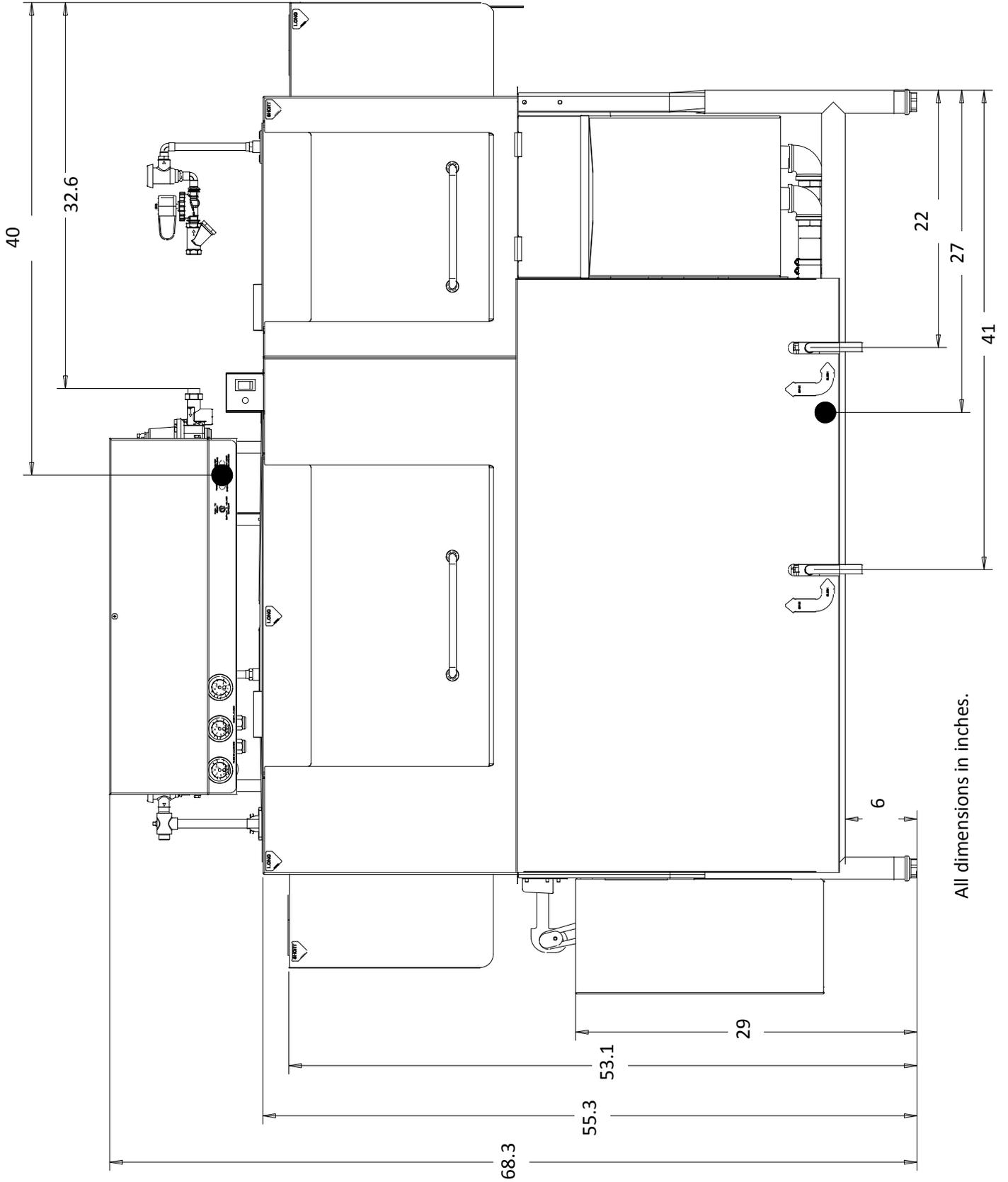
EC66-LW (RIGHT TO LEFT) DIMENSIONS, LEFT SIDE



All dimensions in inches.

SECTION 1: SPECIFICATION INFORMATION

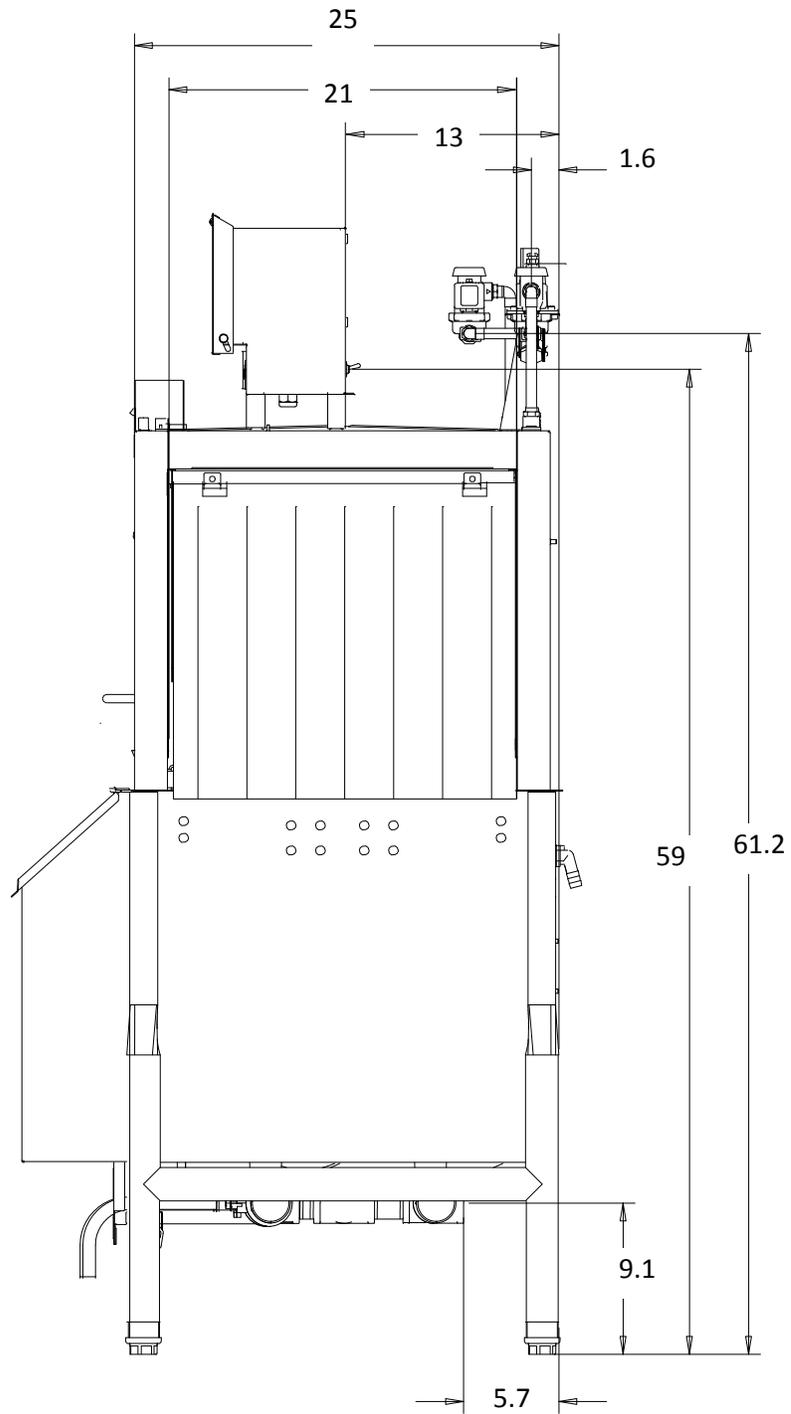
EC66-LW (RIGHT TO LEFT) DIMENSIONS, FRONT



All dimensions in inches.

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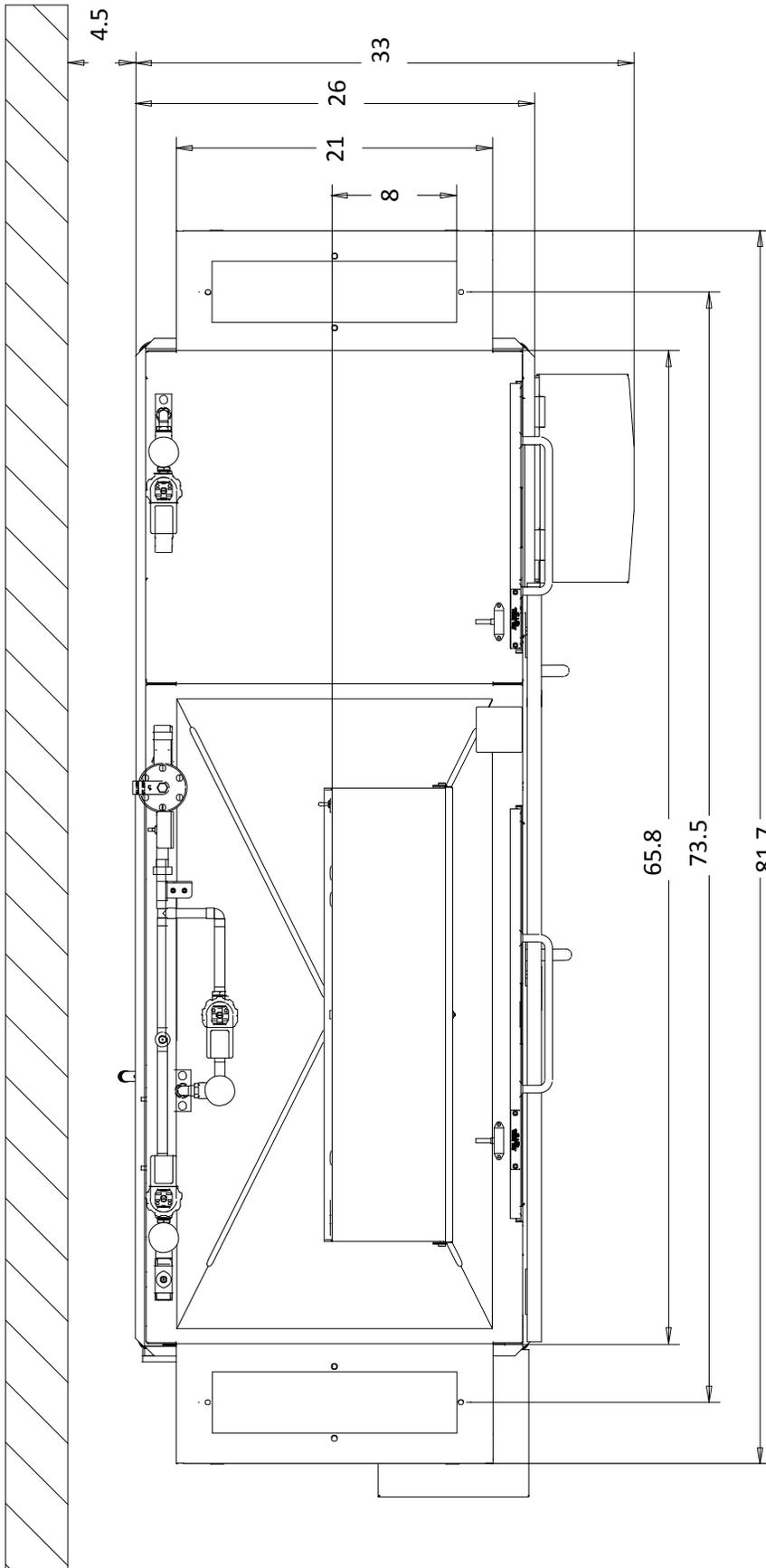
EC66-LW (RIGHT TO LEFT) DIMENSIONS, RIGHT SIDE



All dimensions in inches.

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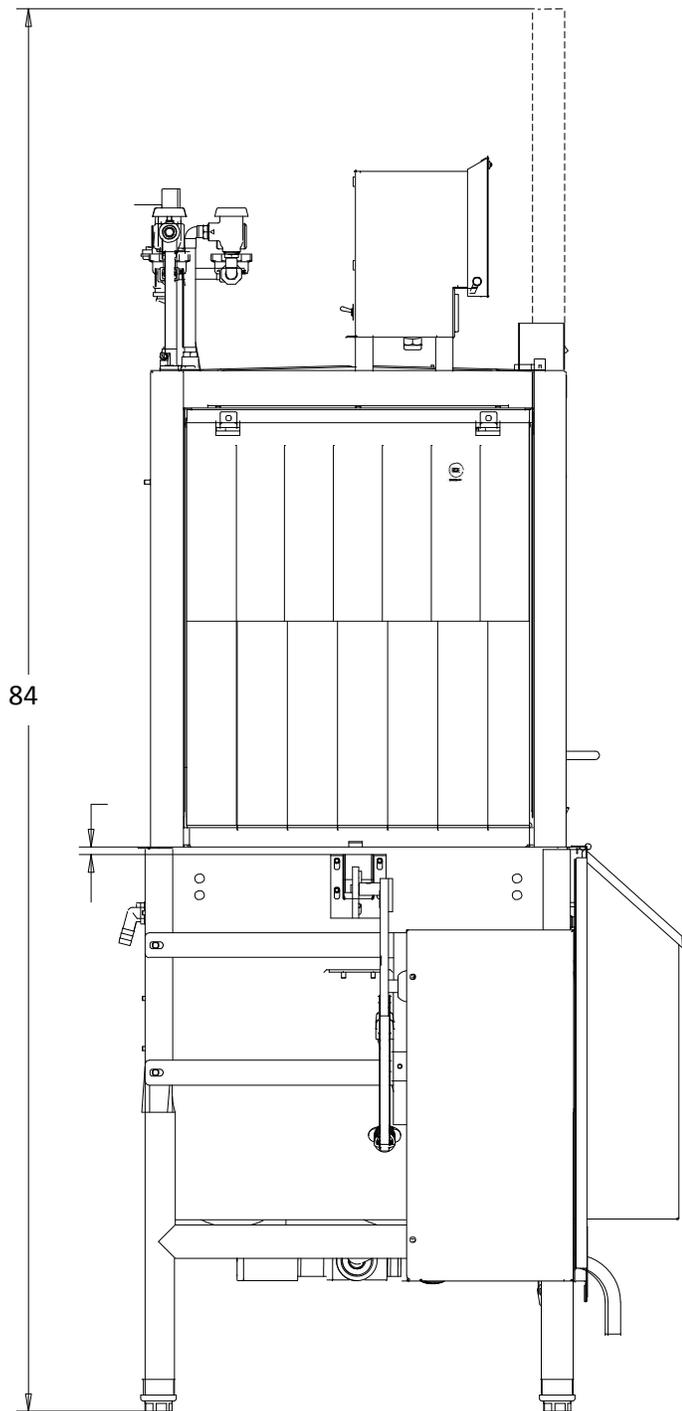
EC66HH-LW (RIGHT TO LEFT) DIMENSIONS, TOP



All dimensions in inches.

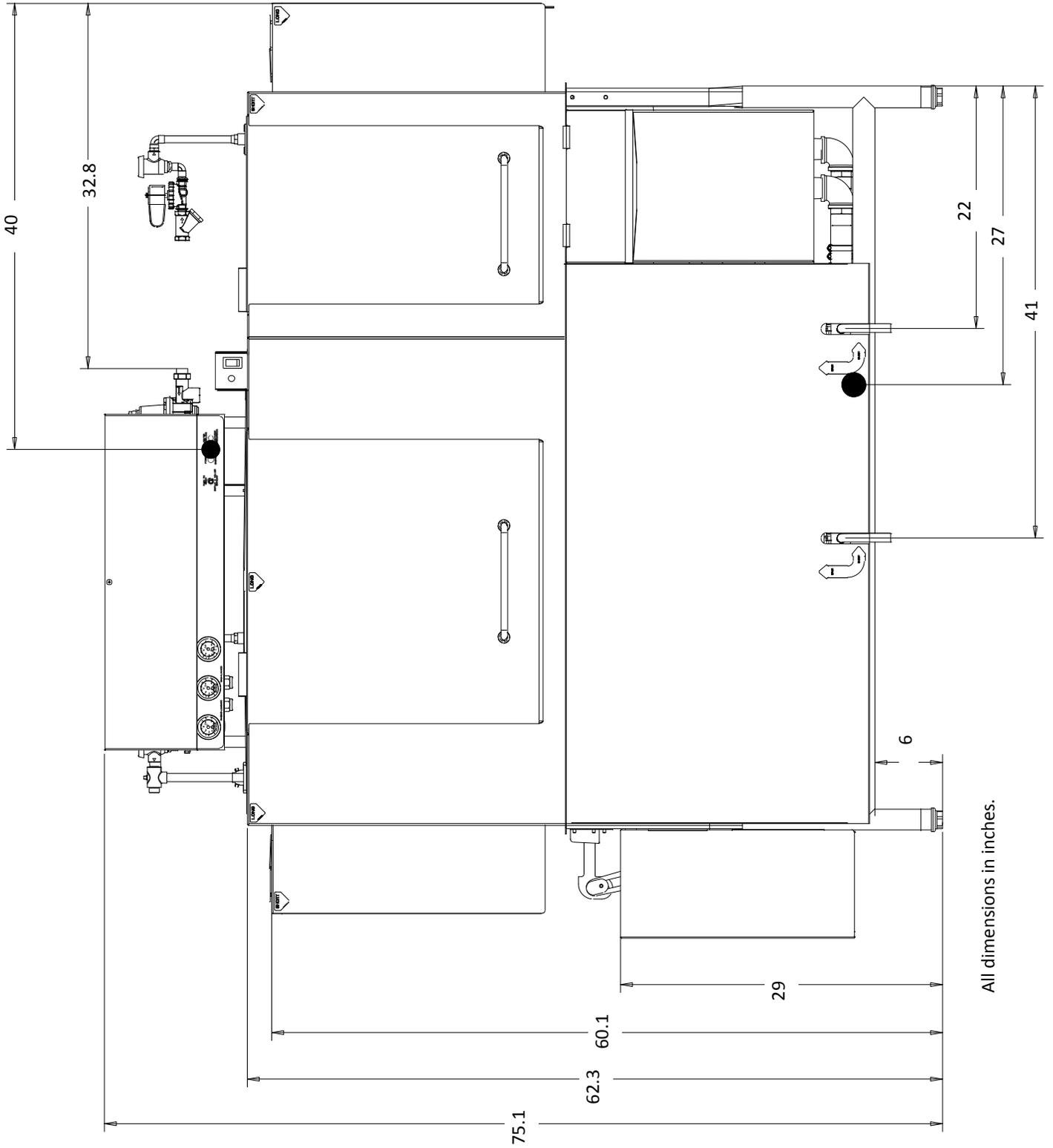
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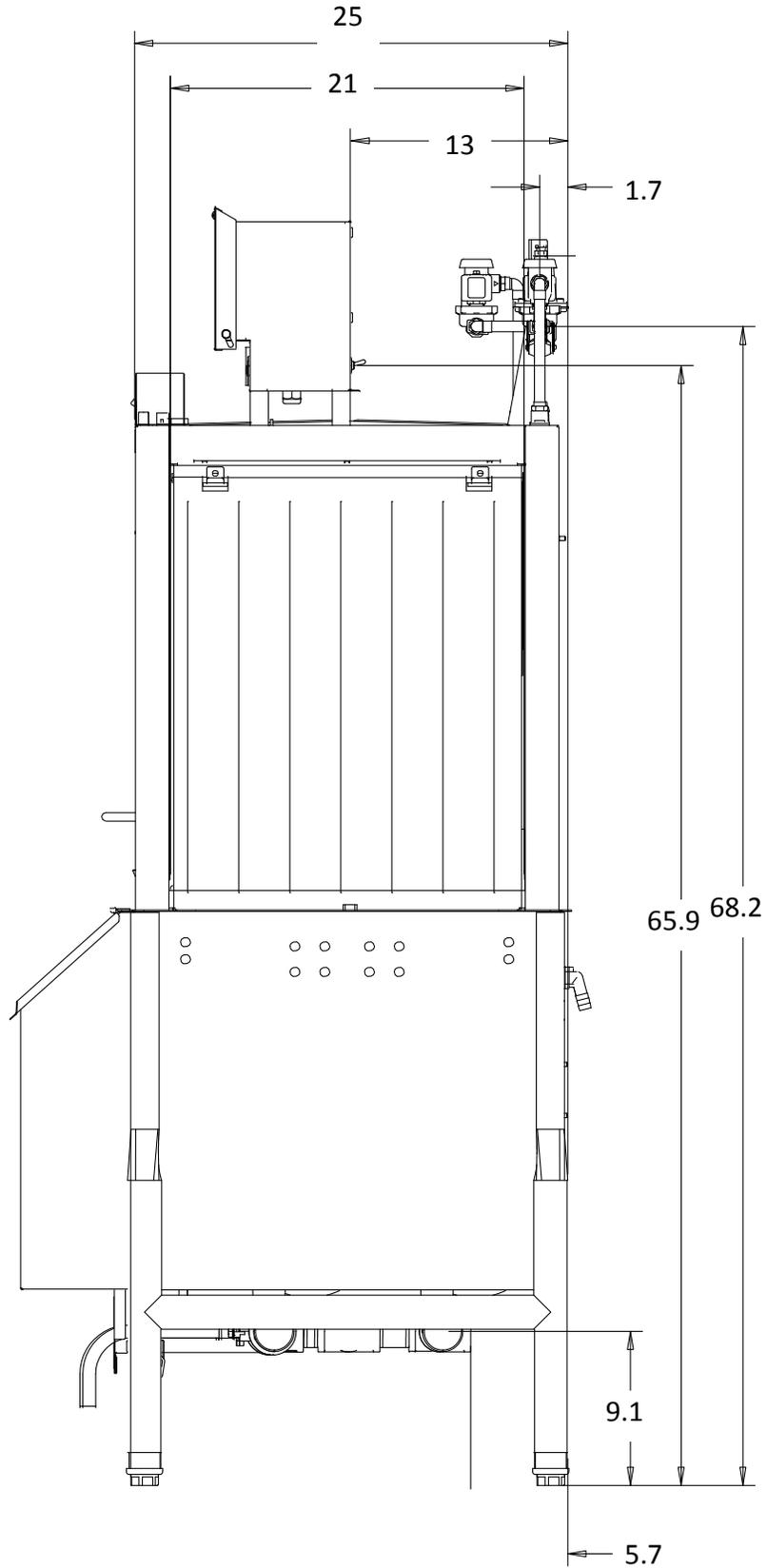
All dimensions in inches.

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EC66HH-LW (RIGHT TO LEFT) DIMENSIONS, FRONT



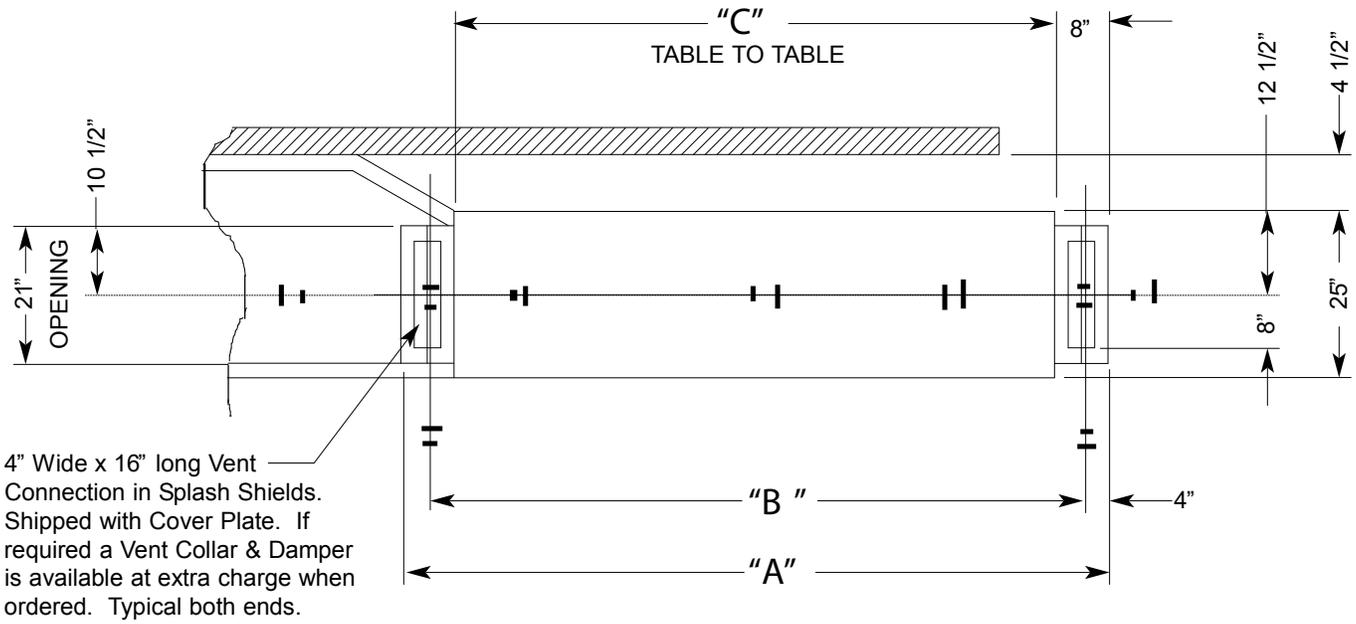
All dimensions in inches.

SECTION 1: SPECIFICATION INFORMATION
EC66HH-LW (RIGHT TO LEFT) DIMENSIONS, RIGHT SIDE

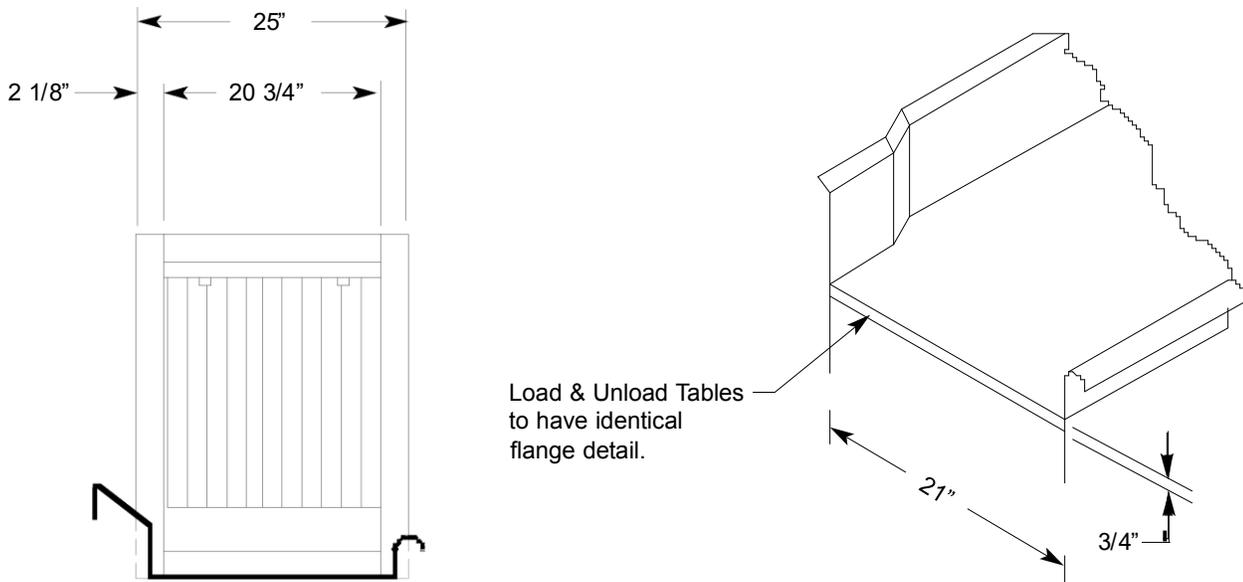


All dimensions in inches.

SECTION 1: SPECIFICATION INFORMATION
DISHTABLE DIMENSIONS



PLAN VIEW



DIMENSIONS EC44-LW (EC66-LW)

- "A" = 60" ("A"=82")
- "B" = 5 1.5" ("B"=74")
- "C" = 44" ("C"=66")

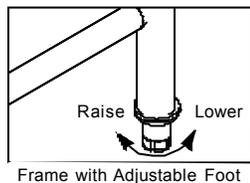
2.0 INSTALLATION | OPERATION INSTRUCTIONS

MACHINE INSTALLATION INSTRUCTIONS

VISUAL INSPECTION: Before installing the unit, check the container and machine for damage. A damaged container indicates that there may be some damage to the machine. If there is damage to both the container and machine, do not throw away the container. The dishmachine has been inspected and packed at the factory and is expected to arrive to you in new, undamaged condition. However, rough handling by carriers or others may damage the unit while in transit. If this situation occurs, do not return the unit to Ecolab; contact the carrier and ask them to inspect the damage to the unit and to complete an inspection report. You must contact the carrier within 48 hours of receiving the machine. Also, contact your Ecolab representative.

UNPACKING THE DISHMACHINE: Once the machine has been removed from the container, ensure that there are no missing parts from the machine. This may not be obvious at first. If it is discovered that an item is missing, contact your Ecolab representative immediately to have the missing item shipped to you.

LEVEL THE DISHMACHINE: The dishmachine is designed to operate while being level. This is important to prevent any damage to the machine during operation and to ensure the best results when washing ware. The unit comes with adjustable bullet feet, which can be turned using a pair of channel locks or by hand if the unit can be raised safely. Ensure that the unit is level from side to side and from front to back before making any connections.

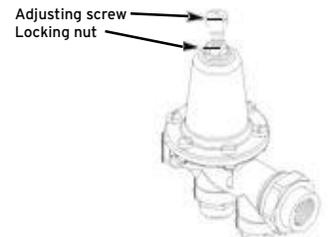


PLUMBING THE DISHMACHINE: All plumbing connections must comply with all applicable local, state, and national plumbing codes. The plumber is responsible for flushing the incoming water line prior to connecting it to remove all foreign debris that may get trapped in the valves or cause an obstruction. Any valves that are fouled by foreign matter left in the water line, and the expenses resulting are not the responsibility of the manufacturer. Water hardness should be a maximum of 6 grains per gallon. Harder water should be treated prior to using the machine. Iron in the water supply can cause staining. A filter designed to remove iron from the supply water is

highly recommended for supplies in excess of 0.1 ppm (parts per million).

CONNECTING THE DRAIN LINE: The models covered in this manual use a gravity discharge drain. All piping from the 1-1/2" FNPT connection must be pitched (1/4" per foot) to the floor or sink drain. All piping from the machine to the drain must be a minimum 1-1/2" I.P.S. and shall not be reduced. There must also be an air gap between the machine drain line and the floor sink or drain. If a grease trap is required by code, it should have a flow capacity of 30 gallons per minute.

WATER SUPPLY CONNECTION: Read the section entitled "PLUMBING THE DISHMACHINE" above before proceeding. Install the water supply line (1/2" pipe size minimum) to the dishmachine line strainer using copper



plumbing. It is recommended that a water shut-off valve be installed between the main supply and the machine to allow access for service. The water supply line must be capable of 20±5 PSI "flow" pressure at the recommended temperature indicated on the data plate. A water pressure regulating valve (PRV) is included as a standard item. The pressure of the incoming water should be adjusted to 20±5 PSI (flow) by turning the adjustment screw on the top of the PRV (clockwise to increase pressure, counter-clockwise to decrease pressure). This adjustment must only be done while the final rinse solenoid valve is open. Do not confuse static pressure with flow pressure. Static pressure is the line pressure in a "no flow" condition (all valves and services are closed). Flow pressure is the pressure in the fill line when the fill valve is opened during the cycle. It is also recommended that a shock absorber (not supplied) be installed in the incoming water line. This prevents line hammer (hydraulic shock), induced by the solenoid valve, from causing damage to the equipment.

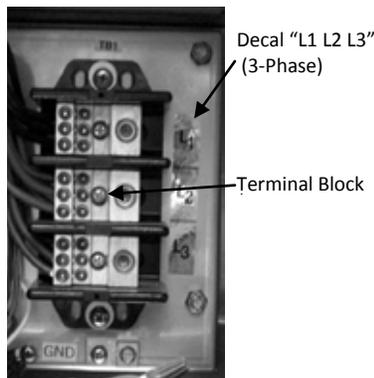
PLUMBING CHECK: Slowly turn on the water supply to the machine after connecting the incoming fill line and the drain line. Check for leaks and repair as required. Leaks must be repaired prior to placing the machine in operation.

2.0 INSTALLATION | OPERATION INSTRUCTIONS

ELECTRICAL INSTALLATION INSTRUCTIONS

ELECTRICAL POWER CONNECTION: Electrical and grounding connections must comply with the applicable portions of the National Electrical Code ANSI/NFPA 70 (latest edition) and/or other electrical codes. Disconnect electrical power supply and lockout the disconnect switch to indicate that you are working on the circuit. The dishmachine data plate is located on the right side of the machine. Refer to the data plate for machine voltage, operating requirements, total amperage load, and serial number.

To install the incoming power lines, open the control box by removing the control box lid. Install 1" conduit into the pre-punched hole in the back of the control box. Route power wires and connect to the lower power terminal block and grounding lug.



Install the service wires (L1, L2 & L3 (Where applicable)) to the appropriate terminals as they are marked on the terminal block. Install the grounding wire into the lug provided. It is recommended that "DE OX" or another similar antioxidation agent be used on all power connections

VOLTAGE CHECK: Apply power to the dishmachine.

Note: Do not turn the machine on.

Check the incoming power at the terminal block and ensure it corresponds to the voltage listed on the data plate. If not, contact a qualified service agency to examine the problem. Do not run the dishmachine if the voltage is too high or low.

Shut off the service breaker and mark it as being for the dishmachine. Advise all personnel of any problems and of the location of the service breaker. Replace the control box cover and tighten the screws.

ELECTRIC HEAT: The thermostats for the machines covered in this manual are factory set. They should not be adjusted except by an authorized service agent.

VENTILATION REQUIREMENTS

VENTILATION OF DISHMACHINE: The dishmachine should be located with provisions for venting into an adequate exhaust hood or ventilation system. This is essential to permit efficient removal of the condensation exhaust. Ensure that the exhaust system is acceptable in accordance with all applicable codes and standards.

NOTE: Any damage that is caused by steam or moisture due to improper ventilation is NOT covered under the warranty.

The machines covered in this manual have the following exhaust requirements:

Load End: 200CFM

Unload End: 400 CFM

The exhaust system must be sized to handle this volume for the dishmachine to operate as it was designed to.

2.0 INSTALLATION | OPERATION INSTRUCTIONS

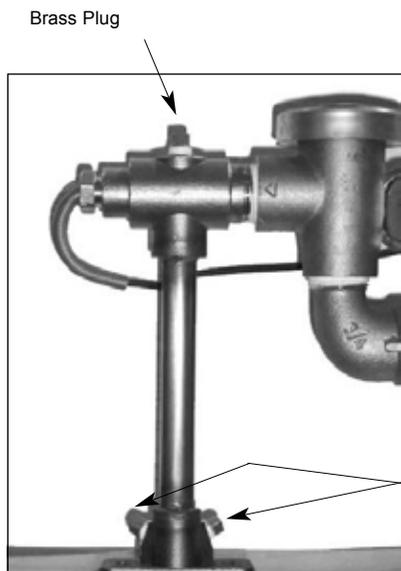
CHEMICAL FEEDER EQUIPMENT: All machines in chemical sanitizing mode require that a separate chemical feeder be connected to it to provide the sanitizer. This feeder needs to be able to operate against a head of 25 PSI and provide 7.34 ml of a 10% Chlorine sanitizer per minute.

Detergent may be introduced into the unit through the removal of the bulkhead plug in the rear of the tub and replacing it with a detergent injection fitting. Remove the bulkhead plug in the side of the tub to install the detergent concentration probe.

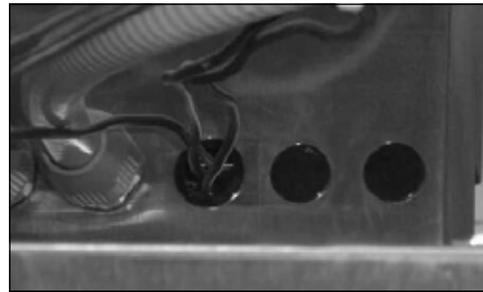


Detergent Connection Point
(Machine rear view)

The 1/8" brass plugs on the incoming plumbing rinse injector may be removed to install sanitizer and rinse aid injection fittings.



All wires for the chemical injectors should be routed through one of the extra openings in the back of the control box.



Back of Control Box

EXHAUST FAN TIMER: Refer to connection instructions provided with the exhaust fan timer kit or in this manual on page 29. Terminals marked EXH1 & EXH2 are provided to facilitate installation.

RINSE AID DISPENSER CONNECTION: Line voltage exists at these terminals whenever the final rinse solenoid valve is energized. Terminals are marked RNS1 & RNS2.

DETERGENT DISPENSER CONNECTION: Line voltage exists at these terminals whenever the wash pump motor is energized. Terminals are marked DET1 & DET2.



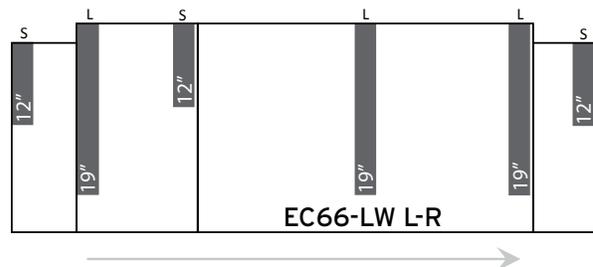
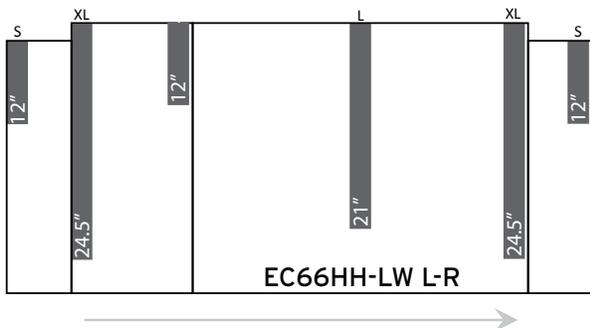
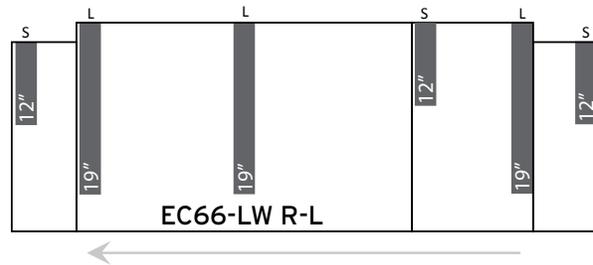
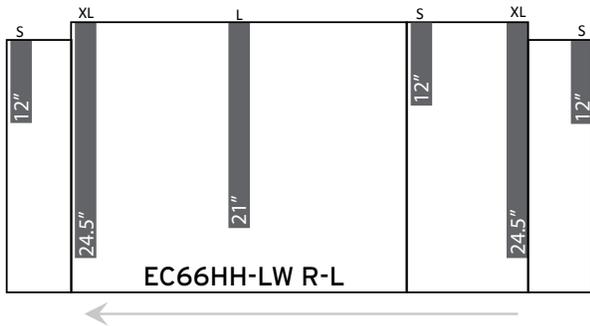
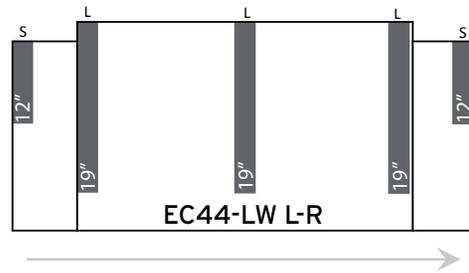
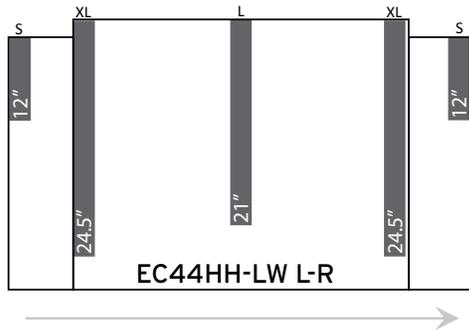
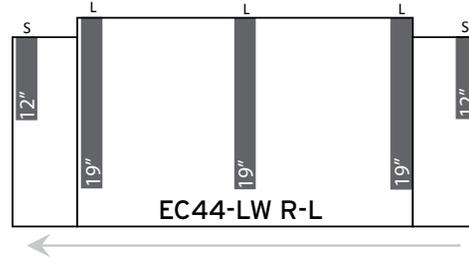
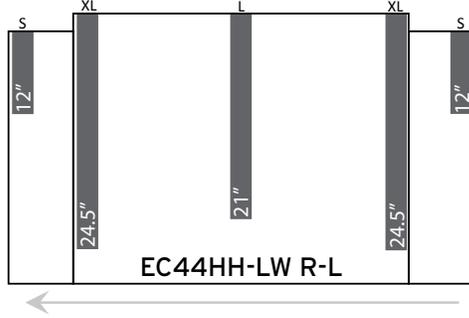
Accessory Connections

2.0 INSTALLATION | OPERATION INSTRUCTIONS

Description	Ecolab#
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12" Curtain	53001265
19" Curtain	53001267
21" Curtain	53001269
24.5" Curtain	53001271

CURTAIN INSTALLATION DIAGRAMS



2.0 INSTALLATION | OPERATION INSTRUCTIONS

DISHMACHINE OPERATING INSTRUCTIONS

PREPARATION: Before proceeding with the start-up of the unit, verify the following:

1. Close door(s) on dishmachine.
2. Close the drain valve(s).
3. Install pan strainers.

POWER UP: To energize the unit, turn on the power at the service breaker. The voltage should have been previously verified as being correct. If not, the voltage will have to be verified.

FILLING THE WASH TUB: Ensure that the delime switch is in the NORMAL position, and place the power switch into the ON position. The machine should fill automatically and shut off when the appropriate level is reached (just below the pan strainer). The wash tub must be completely filled before operating the wash pump to prevent damage to the component. Once the wash tub is filled, the unit is ready for operation.

WARE PREPARATION: Proper preparation of ware will help ensure good results and less re-washes. If not done properly, ware may not come out clean and the efficiency of the dishmachine will be reduced. It is important to remember that a dishmachine is not a garbage disposal and that simply throwing un-scraped dishes into the machine simply defeats the purpose altogether of washing the ware. Scraps should be removed from ware prior to being loaded into a rack. Pre-rinsing and pre-soaking are good ideas, especially for silverware and casserole dishes. Place cups and glasses upside down in racks so that they do not hold water during the cycle. The dishmachine is meant not only to clean, but to sanitize as well, to destroy all of the bacteria that could be harmful to human beings. In order to do this, ware must be properly prepared prior to being placed in the machine.

DAILY MACHINE PREPARATION: Refer to the section entitled "PREPARATION" at the top of this page and follow the instructions there. Afterwards, check that all of the chemical levels are correct and/or that there is plenty of detergent available for the expected workload.

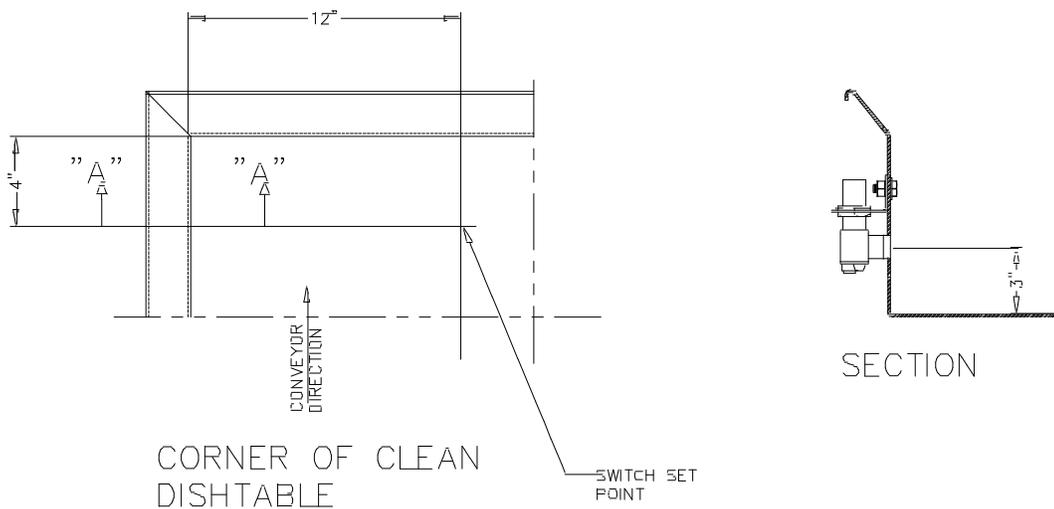
WASHING A RACK OF WARE: To wash a rack, simply slide a rack of soiled ware into the load end of the machine. Once the machine is started, it should pull the rack through the machine and push it out the unload end. Once a rack has started through, you may put another rack in.

OPERATIONAL INSPECTION: Based upon usage, the pan strainers may become clogged with soil and debris as the work- day progresses. Operators should regularly inspect the pan strainers to ensure they have not become clogged. If the strainers do, they will reduce the washing capability of the machine. Instruct operators to clean out the pan strainers at regular intervals or as required by work load.

SHUTDOWN AND CLEANING: At the end of the workday, place the power switch in the OFF position, secure the flow of steam to the machine and open the door(s). Open the drain valves and allow the machine to drain completely. Remove the pawl bar assembly (clean as required). Remove the pan strainers, the prewash strainers (if equipped), run off sheets, and scrap basket strainer. Remove the wash and, if equipped, the prewash arms and verify that the nozzles and arms are free from obstructions. Flush the arms with fresh water. Remove the pump suction strainers and clean out as required. Remove the rinse tray assembly and clean. Remove the curtains and scrub with a mild detergent and warm water. Wipe out the inside of the unit and then reassemble with the components previously removed.

2.0 INSTALLATION | OPERATION INSTRUCTIONS

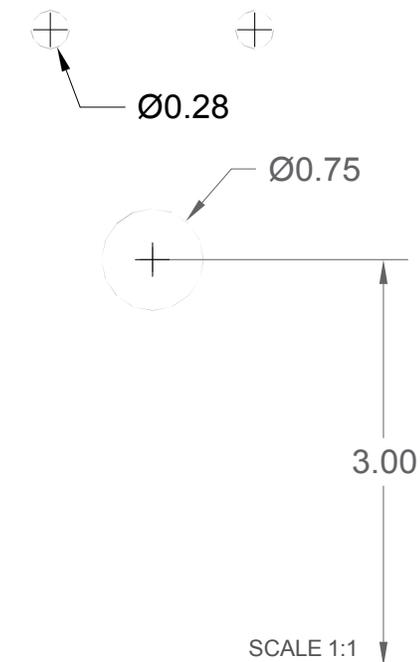
SECTION 2: INSTALLATION/OPERATION INSTRUCTIONS PHOTOELECTRIC LIMIT SWITCH INSTALLATION INSTRUCTIONS



INSTALLATION INSTRUCTIONS:

BRACKET MOUNTING TEMPLATE

1. Locate and drill a 3/4" diameter hole through the back of the dishtable, 4" from the end and 3" above the surface of the table.
2. Using the switch mounting bracket template (a photocopy of it may prove beneficial), locate and drill the 9/32" diameter hole on either side of the 3/4" hole.
3. Mount the switch bracket to the outside of the dishtable using the 1/4"-20 hardware supplied. The cable entering the switch body should be pointing upwards so that the switch sensitivity adjustment screw is downwards for adjusting from the underside of the table.
4. Wiring instructions:
 - a) Remove white/black wire from TB2-9B
 - b) Connect sensor's red/white wire to TB2-9B
 - c) Take white/black wire from step 4a and connect to sensor's red wire
 - d) Connect sensor's red/black wire to TB2-13A
 - e) Connect green to ground



5. Adjust the sensitivity of the proximity switch by turning the adjustment screw on the switch. The proper setting is reached when the switch will sense an object approximately 12" from the switch.

Unless noted, all dimensions are in inches.

2.0 INSTALLATION | OPERATION INSTRUCTIONS

SECTION 2: INSTALLATION/OPERATION INSTRUCTIONS STRIKER PLATE LIMIT SWITCH INSTALLATION INSTRUCTIONS

INSTALLATION INSTRUCTIONS:

1. Wiring: The switch is wired common and normally open because of the hinge design. By interrupting the line in series with the door switches, the dishmachine ceases to operate. Refer to the machine schematic for details on how to wire the switch.

2. Parts of the table switch are mounted in the dishtable, at the end of the table and under the table. See the drawing(s) for the relationship of the switch to the table.

3. Move the limit switch as far down on the two slots as possible and see that the limit switch is straight on the base plate. This might require adjustment of the nut on the connector for the limit switch.

4. Then adjust the inside and the outside connector nuts for the connector box so that it lines up even with the limit switch and the base plate.

5. Tighten down the nuts for the seal so that they are tight.

6. If you have any difficulty you might have to adjust the connectors to the seal, screwing in or screwing out until the installation is straight on the table and the limit switch is actuated correctly by the rack.

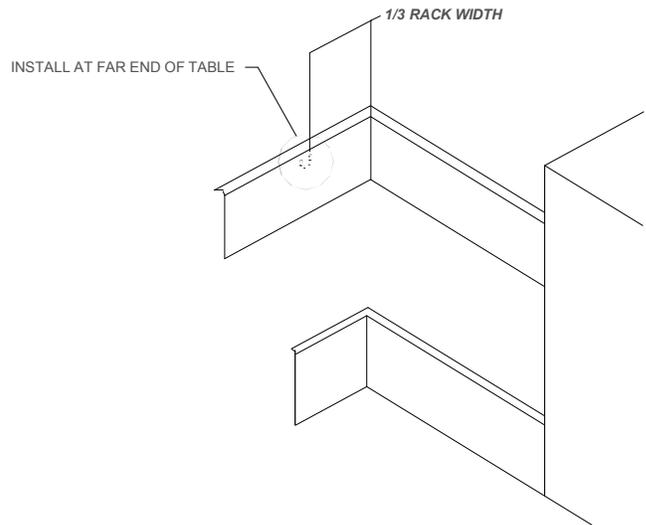
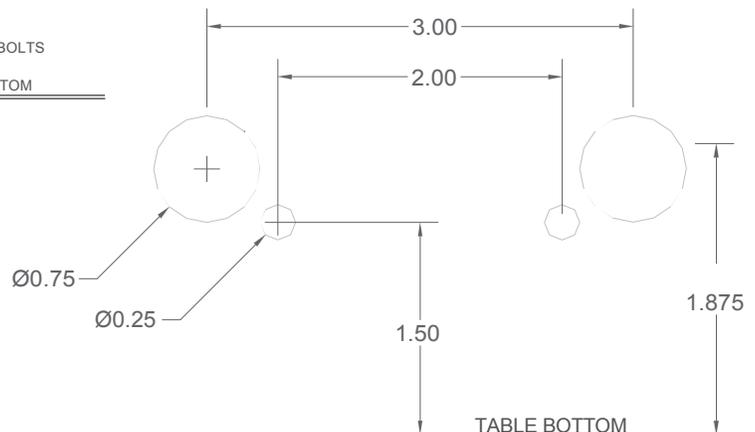
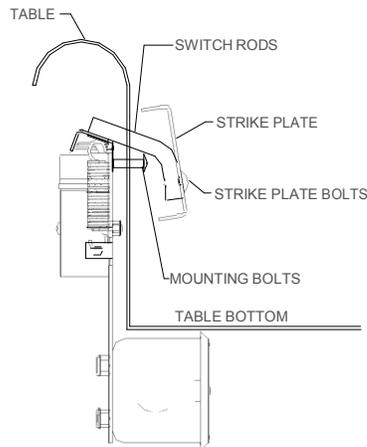


TABLE LIMIT SWITCH THROUGH ROD HOLES



Unless noted, all dimensions are in inches.

2.0 INSTALLATION | OPERATION INSTRUCTIONS

STRIKER PLATE TLS:

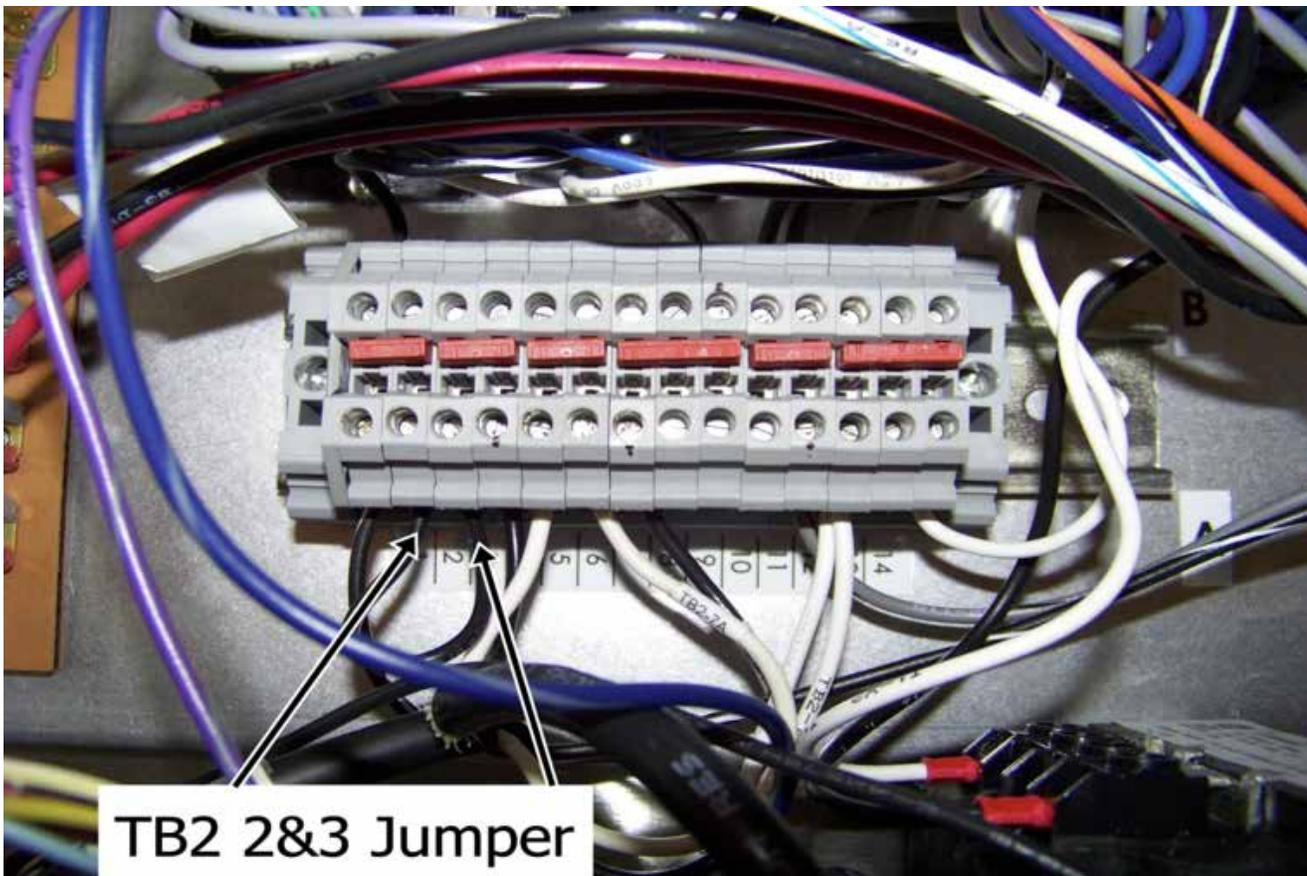
Current instructions:

1. Wiring Switch:

- a. The switch is wired common and normally open because of the hinge design. By interrupting the line in series with the door switches, the dishmachine ceases to operate.
- b. Two wires from limit switch are run into control box of dishmachine in conduit.

2. Wiring Machine:

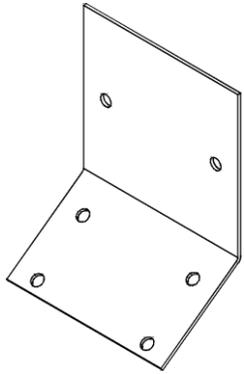
- a. Remove Blk/Wht wire jumper from TB2- 2&3
- b. Install one of the limit switch wires in TB2-2 and the other limit switch wire in TB2-3.



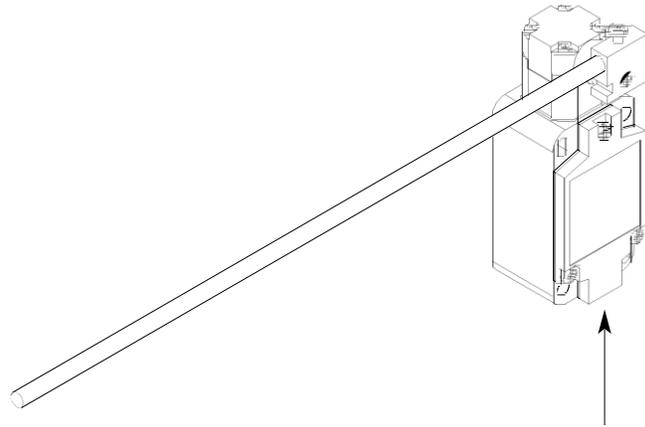
2.0 INSTALLATION | OPERATION INSTRUCTIONS

SECTION 2: INSTALLATION/OPERATION INSTRUCTIONS

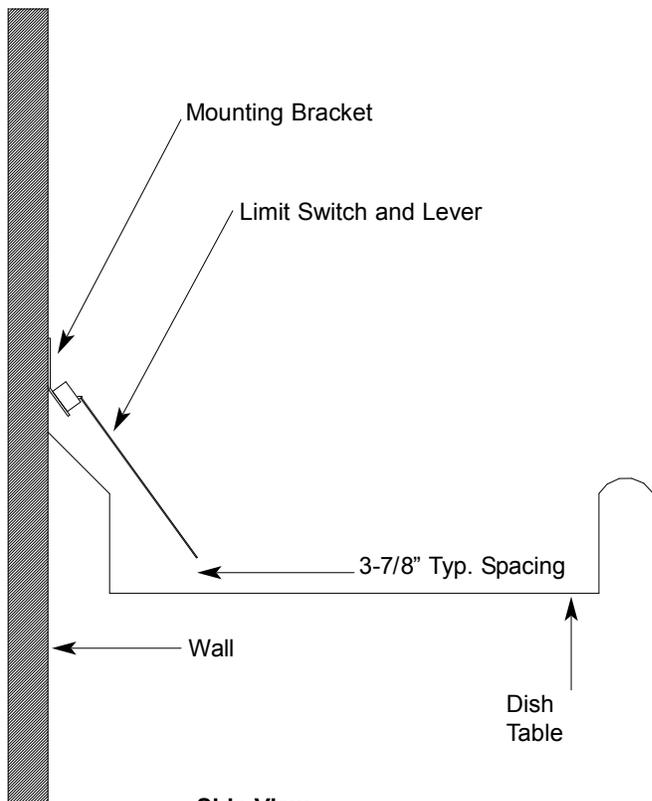
WHISKER LIMIT SWITCH INSTALLATION INSTRUCTIONS



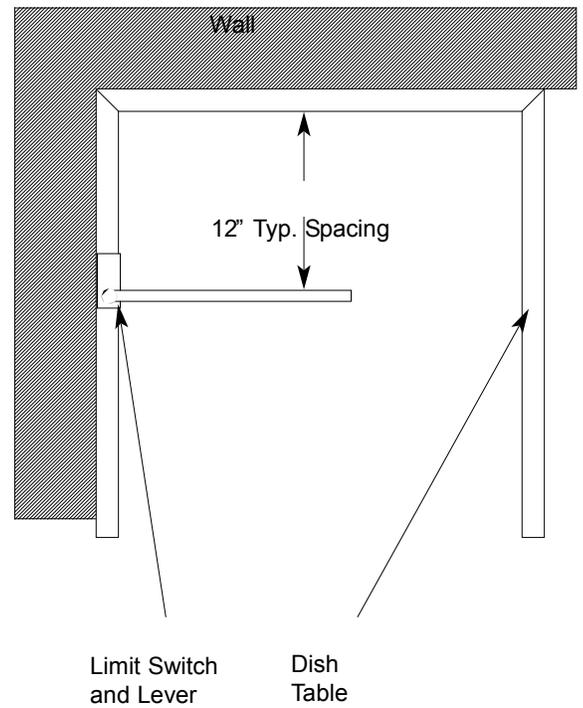
Switch Mounting Bracket



Limit Switch & Lever



Side View



Top View

INSTALLATION INSTRUCTIONS:

1. Wiring: Refer to the machine schematic.
2. Mounting: Mount the switch as indicated in the drawing(s) above.

2.0 INSTALLATION | OPERATION INSTRUCTIONS

EXHAUST FAN TIMER INSTALLATION INSTRUCTIONS:

The exhaust fan timer provides a timed switch to operate a customer supplied external exhaust fan circuit. It does not supply power to the fan. The instructions below will explain how to connect the timer kit to this dishmachine, they do not go into detail on how the connections from the exhaust fan to the machine are made since this can vary depending on the type of exhaust fan and how it is connected to the accounts electrical system.

NOTICE: The switched contacts of the exhaust fan timer are limited to 5Amps, 1/4HP at 240 volts AC MAX.

1. Turn off the dishmachine. Be sure all power sources to the dish machine have been turned off and locked out.
2. Remove the upper control box cover
3. Mount the Timer to the Din Rail
 - a. The Crouzet TU2R1 timer snap mounts to the DIN rail and is positioned directly between the heater contactor (R1) and the drive motor contactor (R2) as shown below.
 - b. Hook the timer onto the top of the DIN rail.
 - c. Push the timer bottom until it snaps firmly onto the DIN rail.
4. Wire the Timer into the dish machine per the included electrical schematic.
5. Set the timer controls as follows:
 - a. Set the "Function" to C.
 - b. Set the timed range to 1-10min
 - c. Set the time to 5.

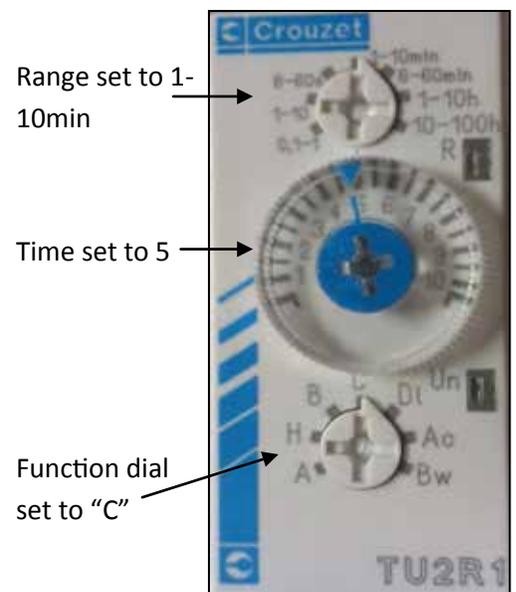
Note: Function C forces the timed switch to close upon the energizing of the drive motor. The switch will remain closed until some programmed time after the drive motor de-energizes. The amount of time is set by choosing a range (1-10 min in this example), and choosing a point in the range with the larger dial (5 min in this example). Adjust time as needed.

6. Apply vent fan kit labels to the dish machine
 - a. Apply the vent fan kit wiring diagram on an open space inside the control box cover. Do not cover any existing labels on the inside of the lower control box cover with the vent fan kit wiring diagram.

NOTE: Instructions are limited to installation of the Exhaust Fan Timer Kit to the point of the field wiring terminal board EXH1/EXH2. Connections from EXH1/EXH2 to the customer supplied exhaust fan circuit should be made by a qualified licensed electrician following all national, local, and municipal electrical codes



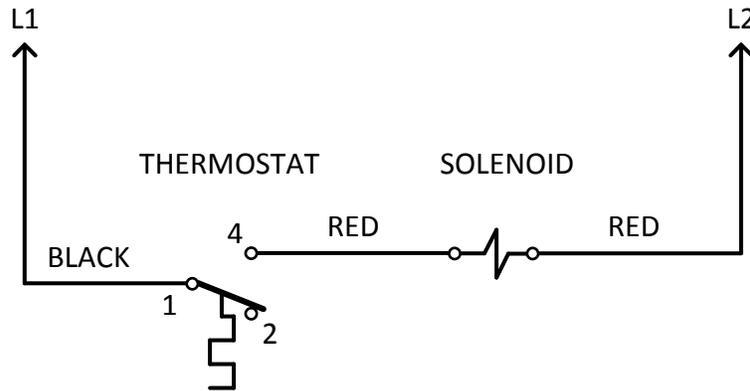
R1 Timer R2



7.0 ELECTRICAL SCHEMATICS

DRAIN QUENCH & CONVEYOR EXHAUST FAN

DRAIN QUENCH SYSTEM

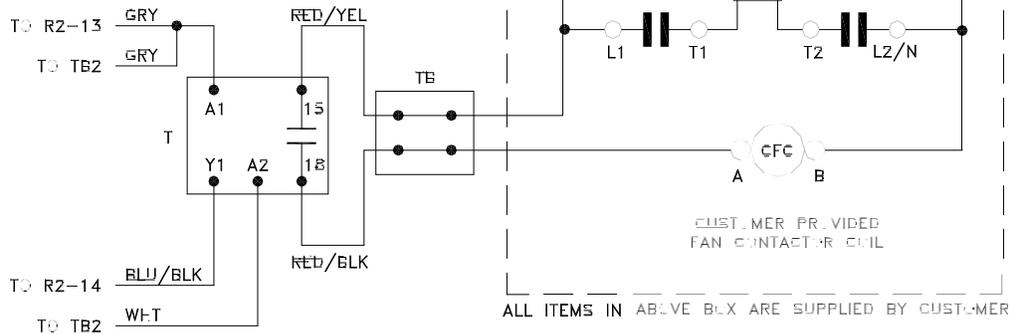


CONNECT BLACK WIRE TO MOTOR CONTACTOR – L1 WITH PIGGYBACK TERMINAL PROVIDED
 CONNECT WHITE WIRE TO MOTOR CONTACTOR – L2 WITH PIGGYBACK TERMINAL PROVIDED

CONVEYOR EXHAUST FAN HOOKUP

LEGEND

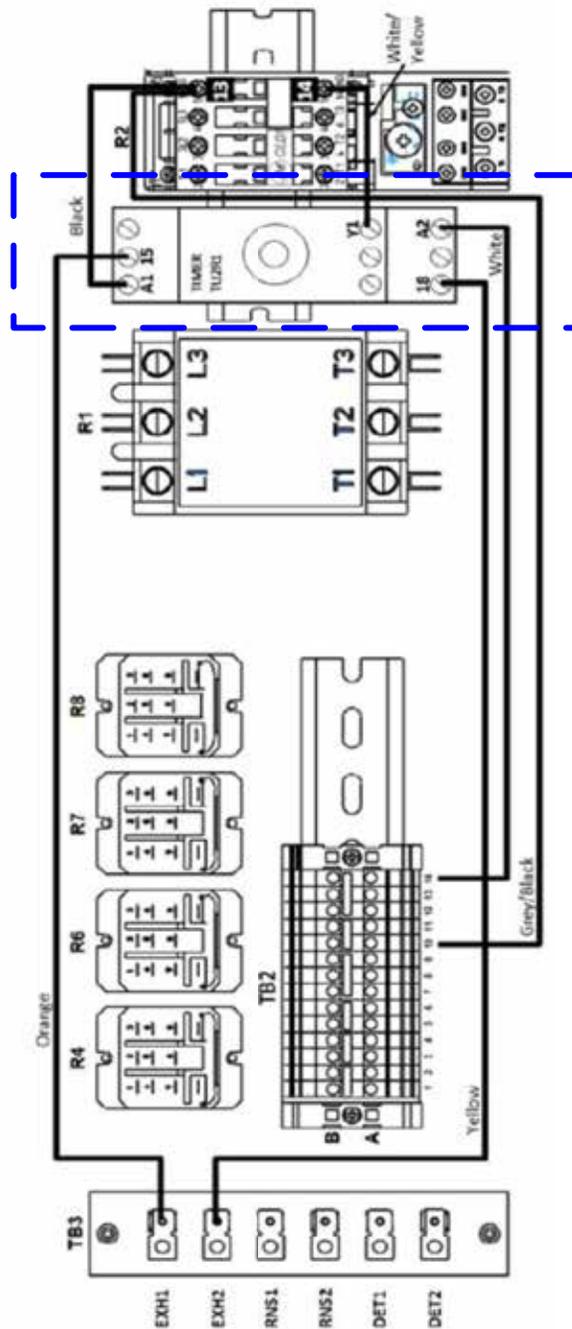
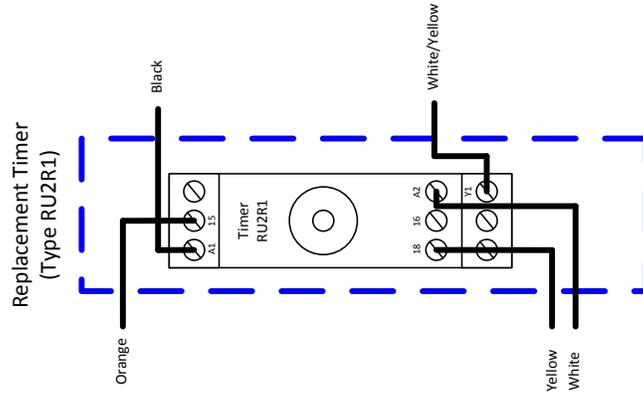
T TIMER
 TB TERMINAL BOARD



ALL ITEMS IN ABOVE BOX ARE SUPPLIED BY CUSTOMER

905-002-55-26C

7.0 ELECTRICAL SCHEMATICS



2.0 INSTALLATION | OPERATION INSTRUCTIONS

DELIMING OPERATIONS:

In order to maintain the dishmachine at its optimum performance level, it will be required to remove lime and corrosion deposits on a frequent basis. Read and follow all instructions on the label of the delimiting solution.

To proceed with the delimiting operation, fill the dishmachine and add the correct amount of delimiting solution as recommended by the delimiting solution manufacturer. The water capacity of the various tanks of the dishmachine can be verified on the specification sheet(s) of this manual.

Perform the following operations to delimit the dishmachine:

1. Turn the AUTOMATIC/DELIME switch on the back of the control box to the DELIME position.
2. Disconnect or turn off all chemical feeder pumps.
3. Close all doors (after adding the delimiting solution).
4. Run the machine for the recommended period of time.
5. Turn the unit off and open the doors.
6. Wait five minutes, then inspect the inside of the machine. If the machine is not delimited, run another time cycle as per the delimiting solution's instructions.
7. When clean, drain and re-fill the machine.
8. Run in MANUAL for 10 minutes to remove residual delimiting solution.
9. Drain and re-fill the machine.

This equipment is not recommended for use with de-ionized water or other aggressive fluids. Use of de-ionized water or other aggressive fluids will result in corrosion and failure of materials and components. Use of de-ionized water or other aggressive fluids will void the manufacturer's warranty.



Delime Switch

2.0 INSTALLATION | OPERATION INSTRUCTIONS

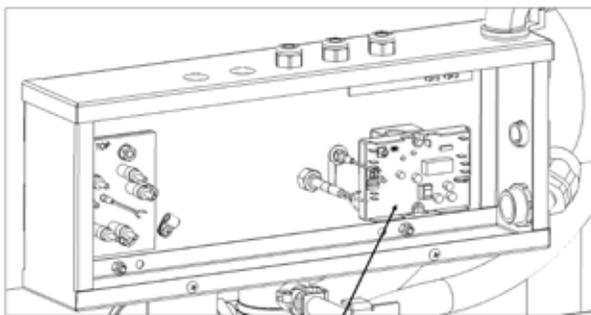
CHANGING SANITIZATION MODE:

If the machine has a dataplate like the one shown, which indicates both Hot Water Sanitizing and Chemical Sanitizing operation parameters (the area within dashed box), it is possible to change the sanitizing mode after the machine has left the original manufacturer's facility. This change can only be performed by an authorized Ecolab service technician. If the machine does not have a dataplate like the one shown, the sanitization mode **CAN NOT** be changed.

PREWASH MOTOR	1 HP	6.0 A	6.0
WASH MOTOR	2 HP	8.5 A	8.5 A
TOTAL LOAD		16.3 A	16.3 A
MINIMUM INCOMING STEAM PRESSURE			10 PSIG
MAXIMUM INCOMING STEAM PRESSURE			20 PSIG
HOT WATER SANITIZING		CHEMICAL SANITIZING	
180° F MIN.	INCOMING WATER TEMP. (RECOMMENDED)	140° F MIN.	
3.9 GPM	INLET WATER REQUIRED	3.9 GPM	
N/A	MINIMUM CHLORINE REQUIRED	50 PPM	
6.0 FPM	CONVEYOR SPEED	6.0 FPM	
160° F MIN.	WASH TANK TEMPERATURE	140° F MIN.	
180° F MIN.	FINAL RINSE TEMPERATURE	120° F MIN.	
20 ± 5 PSI	FLOW PRESSURE	20 ± 5 PSI	
CONVERSION OF SANITIZING MODE TO BE CONDUCTED BY AUTHORIZED REPRESENTATIVE ONLY. REFER TO INSTRUCTIONS IN INSTALLATION & OPERATION MANUAL.			

Please note the parameters for both modes of sanitization. If your data plate has this information, it is convertible from one mode to another.

TEMPERATURE CONTROLLER ADJUSTMENT: Remove the front dress panel from the machine to expose the heater/temp controller box. Remove the cover from the heater/thermostat box. Locate the wash tank regulating temp controller (see diagram).



Wash Temperature Controller

The EC-LW machine utilizes an electronic temperature controller to set and maintain the correct wash water temperature. NSF requirements specify that the wash water during operation be 140°F minimum in the chemical sanitizing mode and 160°F minimum in the hot water sanitizing mode. Adjust the thermostat to achieve the required minimum temperatures during operation. Set the coarse adjustment range by selecting the correct dip switch setting, then use the fine temperature adjustment to dial in to the correct temperature setting. Replace

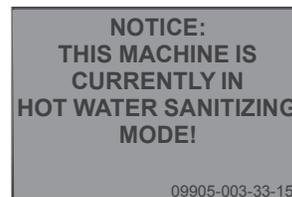
heater/thermostat box cover and front dress panel.

IDENTIFICATION OF SANITIZING MODE: Apply the correct temperature gauge label to the face of the temperature gauges. In the chemical sanitizing mode, the temperature gauge labels must specify 140°F minimum wash temperature and 120°F minimum rinse temperature. In the hot water sanitizing mode, the temperature gauge labels must specify 160°F minimum wash temperature and 180°F minimum rinse temperature.

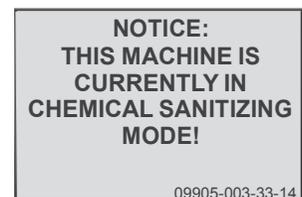


Control Box Gauge Location

Apply one of the correct sanitizing mode labels in a visible location on the side of the control box. Apply the second sanitizing mode label near the machine dataplate (located on the side of the wash tank).



Orange background



Yellow background

ADJUST INCOMING WATER TEMPERATURE: Adjust the external rinse booster heater to achieve the required minimum temperature for the final rinse. In chemical sanitizing mode, the final rinse temperature is 120°F minimum. In hot water sanitizing mode, the final rinse temperature is 180°F minimum.

INSTALL SANITIZER DISPENSER: For machines in the chemical sanitizing mode, a NSF Standard 29 approved chemical dispenser must be installed to dispense sanitizer into the final rinse line. Follow instructions included with the chemical dispenser. After installation of the dispenser, verify that the required minimum sanitizer concentration is dispensed. Refer to the machine data plate.

FINAL CHECK: Verify that the incoming water matches the flow pressure and temperature requirements listed on the machine data plate. Verify that minimum wash and rinse temperatures are maintained during operation.

2.0 INSTALLATION | OPERATION INSTRUCTIONS

CHANGING THE EC44-LW/EC44HH-LW DIRECTION OF TRAVEL:

The EC44-LW dishmachine has the ability to have its direction of travel changed from left to right, or from right to left. Direction of travel is determined by which end the rack of ware is put into the machine and which end the rack comes out.

There may come times when it is necessary to change the direction of travel after the unit is installed. The instructions provided here are for maintenance personnel only. Unauthorized persons should not attempt any of the steps contained in these instructions.

Warning: many of the instructions and steps within this document require the use of tools and may also require that personnel change the wiring of the machine. Only authorized personnel should ever perform any maintenance evolution on the dishmachine!

PREPARATION

1. Power must be secured to the unit at the service breaker. Tag or lock out the service breaker to prevent accidental or unauthorized energizing of the machine.
2. Disconnect incoming water at the water pressure regulator or Y-strainer.
3. Disconnect the service drain line from the drain plumbing of the dishmachine itself. Ensure that the unit is completely drained before doing this.
4. Remove the locking screw from the control box.
5. Remove the front dress panel.

TOOLS REQUIRED

The following tools will be needed to perform this maintenance evolution:

1. 5/16" nut driver
2. 7/16" nut driver
3. 7/16" combination wrench
4. 7/16" socket with drive ratchet and 4" extension
5. 12" pipe wrench
6. 10" adjustable wrench
7. Wire cutters
8. Phillips head screwdriver

TIME REQUIRED

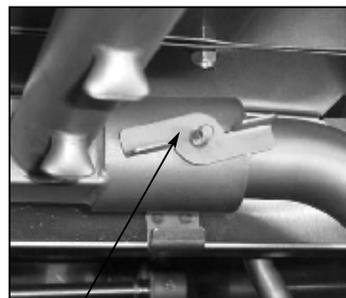
It is estimated that it will take (1) person three hours to perform this task, not including all of the items indicated in the section entitled "PREPARATION".

IMPORTANT NOTES

1. Do not lose hardware! Place hardware in a safe spot away from the machine, ensuring that it does not fall loose into the machine tub. Hardware that is drawing into the suction of the wash pump will damage the equipment. If you do need more hardware, contact your ECOLAB representative to purchase new items.
2. Read these instructions thoroughly before attempting this maintenance evolution. Become familiar with the parts and what actions need to be taken. This will save time in the long run!

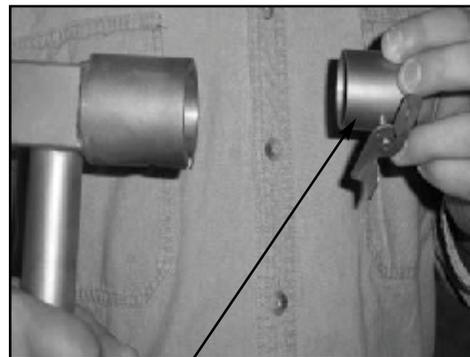
STEPS

1. Remove the upper wash arm assembly by loosening the spin nut. The spin nut has a stop so it will not come off. Once it is loosened, the wash arm assembly should slide off.



Spin nut

2. Remove the end cap from the wash arm assembly and place in the opposite end, securing it snugly.



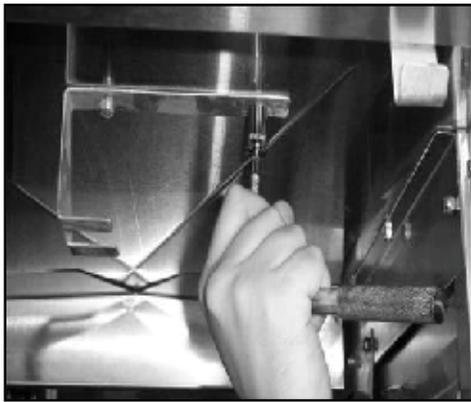
End cap

3. With the end cap securely in the opposite end of the wash arm assembly, set the assembly gently to the side. Go back inside the unit to where the upper wash arm assembly secured in the unit and turn the spin nut so that it is all the way down. This needs to be done because in a further step, if the spin nut is out, it will get in the way. Do not over-tighten the spin nut as it only needs to be out of the way, not secured.

2.0 INSTALLATION | OPERATION INSTRUCTIONS

CHANGING THE EC44-LW/EC44HH-LW DIRECTION OF TRAVEL CONT.:

4. Remove the upper wash arm assembly bracket. This step may require that you have help as the bolts for securing the bracket to the top of the inner hood are the same bolts that hold the control box to the hood top. Do not remove the bolts once the nuts are taken off. Once the bracket is removed, place the nuts immediately back on the bolts. To hold the bolts (to keep them from spinning), a 7/16" combination wrench or 7/16" nut driver will be required in order to hold the bolt head inside the control box.



Removing bracket (bottom view)



Removing bracket (control box view)

Remove the locknuts from the opposite bolts used to hold down the control box (do not remove the bolts) and secure the bracket to underside of the hood. The folded part of the bracket should be facing the rear of the machine. Immediately tighten down the locknuts.

5. Remove the splash shield, which is bolted to the underside of the hood next to the wash manifold and turn it 180°.



Removing and turning splash shield

6. Remove the pawl bar and set to the side.



Remove the pawl bar by grasping firmly and lifting up.

7. Remove the lower wash arm assembly by turning the locking screw to unlatch it. The entire assembly should then lift out.

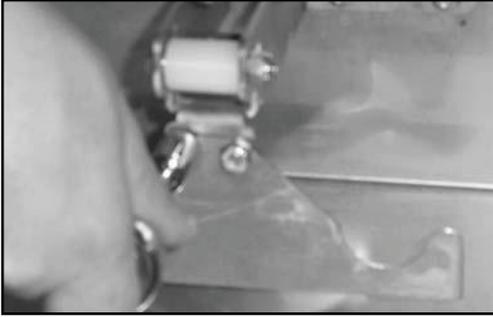


Locking screw

8. Remove the lower wash arm support bracket. Place it to the side with its locknuts.

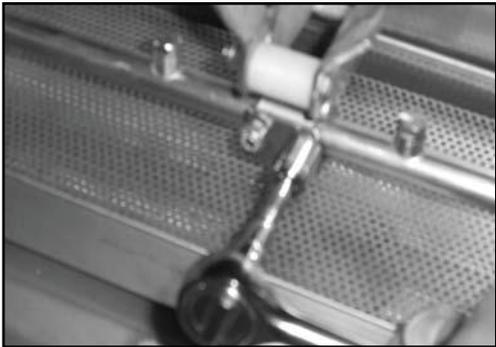
2.0 INSTALLATION | OPERATION INSTRUCTIONS

CHANGING THE EC44-LW/EC44HH-LW DIRECTION OF TRAVEL CONT.:



Removing the locknuts for the lower wash arm support bracket.

9. Remove the lower rinse arm support bracket, which is mounted directly opposite of the lower wash arm support bracket.



Removing the lower rinse arm support bracket

10. Remove the lower and upper rinse arms by unscrewing them and then gently pulling them out.



Unscrewing and removing the lower rinse arm

11. Behind the rinse manifold, remove the nut on the bracket.



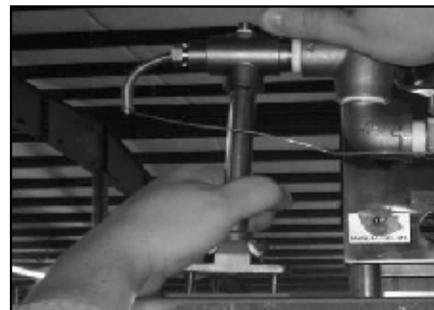
Removing the bracket nut

12. Remove the nuts from the rinse manifold mounting bracket located on the underside of the hood. These nuts are mounted directly to the rinse injector weldment on the hood top.



Removing the locknuts from the rinse manifold mounting bracket

13. The rinse manifold must be removed. This may prove difficult while the rinse injector is still mounted. With great care, it is possible to gently lift the rinse injector off of the hood to allow the rinse manifold to be removed from the unit. Ensure that the gasket in the underside of the hood stays with the rinse manifold as it must be replaced when re-installing the manifold. If the gasket becomes lost or torn, order a new one immediately.

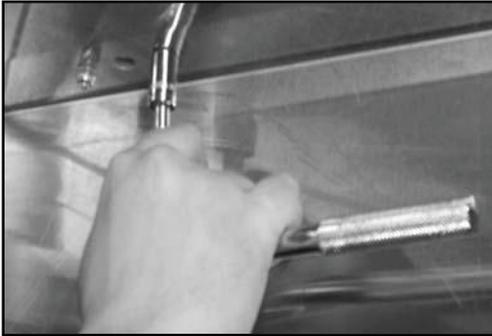


Lifting the rinse injector to make room

14. Remove the hole cover weldment from the top of the hood. The cover is located on the end of the hood opposite of the rinse injector weldment. Once removed, set to the side along with its gasket.

2.0 INSTALLATION | OPERATION INSTRUCTIONS

CHANGING THE EC44-LW/EC44HH-LW DIRECTION OF TRAVEL CONT.:



Removing the hole cover weldment

15. Separate the rinse plumbing from the rest of the incoming plumbing by loosening the union. Ensure that the gasket on the bottom of the rinse injector stays with the assembly as you remove it.



Loosening the union on the incoming plumbing

16. Remove the remaining half of the union from the incoming plumbing.

17. Remove the incoming water pressure regulator from the incoming plumbing and replace with the union half that was removed in step 16. Place the water pressure regulator on the end that the union half was removed from.

18. Place the removed rinse plumbing assembly (with the gasket) in the hole left open from when you removed the hole cover weldment in step 14. Tighten the two halves of the union together.

19. Place the hole cover weldment (with its gasket) over the hole from where the rinse plumbing assembly was originally installed. Tighten down with the locknuts.

20. Re-install the rinse manifold (with its gasket) by connecting it to the rinse injector weldment at its new location. Remove the locknut from the stud for the

bracket down near the rack rails and then secure the bracket to the machine using the same lock nut.

21. Re-install the lower wash arm support bracket to the pawl bar support on the end of the tub opposite from where it was removed.

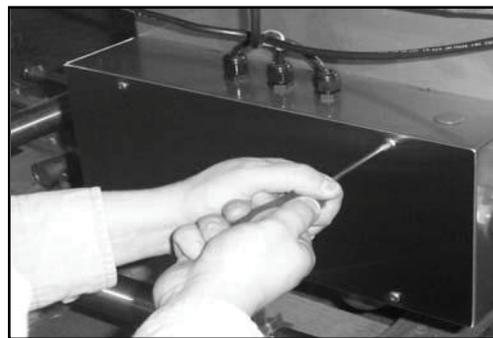
22. Re-install the upper and lower rinse arms. Reinstall the lower rinse arm support bracket.

23. Re-install the lower wash arm assembly, turning it 180° and locking it in place with the locking screw.

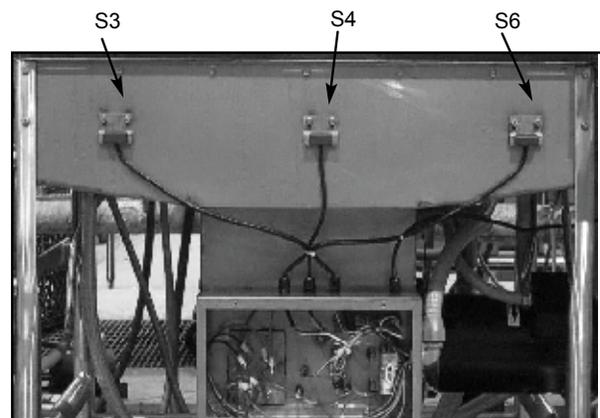
24. Re-install the pawl bar. Ensure that the pawl bar is placed so that when racks are placed in the unit, the pawl bar dogs fold down.

25. Re-install the upper wash arm assembly. If you performed all of the actions outlined in step 2, when you install it, it will be directly over the lower wash arm assembly.

26. Remove the heater box cover by unscrewing the four screws holding it on.



Removing the heater box cover



Front of rack conveyor showing the conveyor switches

2.0 INSTALLATION | OPERATION INSTRUCTIONS

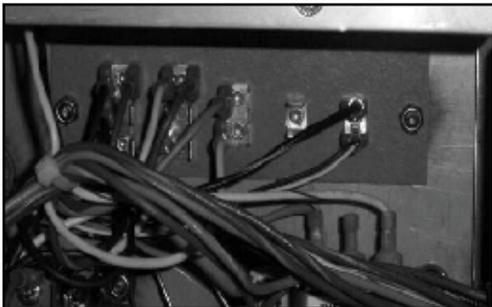
CHANGING THE EC44-LW/EC44HH-LW DIRECTION OF TRAVEL CONT.:

Conveyor Switch Chart:

Unit Direction	Switch #S3	Switch #S4	Switch #S6
Left to Right	Wash Switch #1	Wash Switch #2	Rinse Switch
Right to Left	Rinse Switch	Wash Switch #2	Wash Switch #1

The chart above lists the conveyor switches and their functions, depending on the direction of travel for the machine. As you can see, when you change the direction of the conveyor, you must also alter the way the conveyor switches operate.

There is no need to remove the switches, only to change the wiring inside the heater box.



Terminal board inside the heater box

27. **Note:** Before beginning any part of this maintenance evolution that deals with the wiring of the machine, ensure that it is performed by qualified technicians only. Always refer to the machine schematic, located inside the control box, for any questions. Wash Switch #1 and the Rinse Switch need to have their wire positions changed on the terminal board pictured above. Locate the gray/yellow wire for Wash Switch #2 and the orange/yellow wire for the Rinse Switch. Exchange their positions on the terminal board.

Wash Switch #1 (do not confuse it with the gray/yellow wire for Wash Switch #2) and the orange/yellow wire for the Rinse Switch. Exchange their positions on the terminal board.

28. Verify that the plumbing has been reassembled correctly and that the hole cover weldment has been replaced and none of the gaskets are torn or pinched as this could lead to leaking when the machine operates.

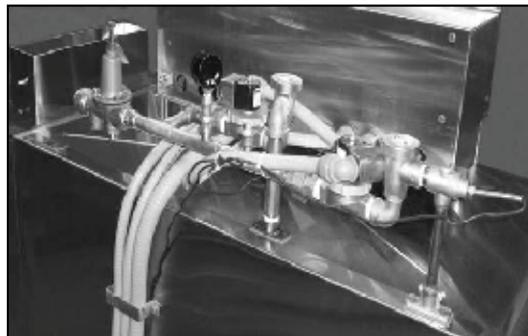
29. Re-install the heater box cover.

SPECIAL PARTS

Gasket, Rinse Injector:
Ecolab No.: 96020482



Incoming plumbing assembly for a Left to Right machine (note hole cover weldment in lower right corner)



Incoming plumbing assembly for a Right to Left machine (note hole cover weldment in upper left corner)

AFTER MAINTENANCE ACTIONS

1. Reconnect the incoming water and drain lines and then restore power to the unit. Run the unit for at least 1/2 hour to ensure there are no leaks. Test the unit with an empty rack to ensure that it pulls the rack all of the way through the unit. If any problems arise you can contact your Ecolab representative.
2. Replace the front dress panel once the unit is ready for service again.

SPECIAL NOTES

1. There is a possibility that you may be required to shorten or lengthen the conduit and wire lengths for the inlet solenoid on the rinse plumbing once it is moved. This work should be performed by qualified technicians who will do the work according to applicable local, state and national codes. Questions concerning this should be directed to your Ecolab representative.

3.0 PREVENTATIVE MAINTENANCE

The dishmachines covered in this manual are designed to operate with a minimum of interaction with the operator. However, this does not mean that some items will not wear out in time.

There are many things that operators can do to prevent catastrophic damage to the dishmachine. One of the major causes of component failure has to do with prescrapping procedures. A dishmachine is not a garbage disposal; any large pieces of material that are put into the machine shall remain in the machine until they are either broken up (after spreading out on your ware!) or physically removed. Strainers are installed to help catch debris, but they do no good if they are clogged. Have operators regularly inspect the pan strainers to ensure (1) that they are free of soil and debris and (2) they are laying flat in the tub.

When cleaning out strainers, do NOT beat them on waste cans. The strainers are made of metal and can be forgiving; but once severe damage is done, it is next to impossible for the strainer to work in the way it was designed to. Wipe out strainers with a rag and rinse under a faucet if necessary. For stubborn debris, a toothpick should be able to dislodge any obstructions from the perforations. Always ensure that strainers are placed back in the machine before operation and that they lay flat in the tub.

You may wish to contact your Ecolab representative in order to learn more about how your water hardness will affect the performance of your machine. Hard water makes dishmachines work harder and decreases efficiency and reliability.

Again, it is important to remind operators that trying to perform corrective maintenance on the dishmachine could lead to larger problems or even cause harm to the operator. If a problem is discovered; secure the dishmachine using proper shutdown procedures as listed in this manual and contact your Ecolab representative.

Some problems, however, may have nothing to do with the machine itself and no amount of preventative maintenance is going to help. A common problem has to do with temperatures being too low. Verify that the water temperatures coming to your dishmachine match the requirements listed on the machine data plate. There can be a variety of reasons why your water temperature could be too low and you

should discuss it with your Ecolab representative to determine what can be done.

By following the operating and cleaning instructions in this manual, you should get the most efficient results from your machine. As a reminder, here are some steps to take to ensure that you are using the dishmachine the way it was designed to work:

1. Ensure that the water temperatures match those listed on the machine data plate.
2. Ensure that all strainers are in place before operating the machine.
3. Ensure that all wash and/or rinse arms are secure in the machine before operating.
4. Ensure that drains are closed/sealed before operating.
5. Remove as much soil from dishes by hand as possible before loading into racks.
6. Do not overfill racks.
7. Ensure that glasses are placed upside down in the rack.
8. Ensure that all chemicals being injected to machine have been verified as being at the correct concentrations.
9. Clean out the machine at the end of every workday as per the instructions in the manual.
10. Always contact your Ecolab representative whenever a serious problem arises.
11. Follow all safety procedures, whether listed in this manual or put forth by local, state or national codes/ regulations.

3.0 PREVENTATIVE MAINTENANCE

Note: The maintenance procedures detailed here are manufacturer's instructions for the WINSMITH brand of gear reducer that is installed on the rack conveyors covered in this manual.

Lubrication & Maintenance:

Factory filling - WINSMITH speed reducers are oil filled at the factory to the proper level for the standard mounting position that you will find it in on the unit. The oil level should be checked and adjusted (if necessary) prior to operation, using the oil level plug provided and while the unit is oriented in its operating position.

Ambient temperature - If the operating ambient temperature is other than 51 - 95°F, then refer to the lubrication chart and refill the unit with the correct grade based on actual ambient temperature and operating speed. See "Oil changing" below for additional information.

Oil changing - When changing the oil for any reason, it should be remembered that oils of various types may not be compatible. Therefore, when changing to a different oil, it is recommended that the housing be completely drained and thoroughly flushed with a light flushing oil prior to refilling with the appropriate lubricant. The oil level should be rechecked after a short period of operation and adjusted, if necessary. When changing double reduction models, each housing should be drained and filled independently, even though there may be a common level.

Initial oil change: The new oil in a speed reducer should be changed at the end of 250 hours of operation. This is equivalent to 30 days of operation for 8 hours per day; 15 days of operation for 16 hours per day, or 10 days of operation for 24 hours per day.

Subsequent oil changes: Under normal conditions, after the initial oil change, the oil should be changed after every 2500 hours of operation, or every 6 months, whichever occurs first. Under severe conditions (rapid temperature changes, moist, dirty or corrosive environment) it may be necessary to change oil at intervals of one to three months. Periodic examination of oil samples taken from the unit will help establish the appropriate interval.

Synthetic oils: Synthetic lubricants can be advantageous over mineral oils in that they generally are more stable, have a much longer life, and operate over a wider

temperature range. These oils are appropriate for any application but are especially useful when units are subjected to low start-up temperatures or high operating temperatures. However, continuous operation above 225°F may cause damage to seals or other components. It is recommended that the initial oil be changed or filtered after the first 1500 hours of operation to remove metal particles that accumulate during break-in. Subsequent oil changes should be made after 5000 hours operation if units are operating in a clean environment. This can be extended to 10,000 hours if using new reformulated Mobil SHC lubricants (orange in color) and the lubricant remains free of contamination over this period. See comments under "Subsequent oil changes" for discussion of severe ambient conditions.

Long term storage or infrequent operation: If a speed reducer is to stand idle for an extended period of time, either prior to installation or during use, it is recommended that the unit be filled completely with oil to protect interior parts from rust and corrosion due to internal condensation. Be sure to drain the oil to the proper level before placing the speed reducer in service.

Grease fittings: Some units are equipped with grease fittings to lubricate bearings not adequately lubricated by the oil splash. These fittings must be lubricated every 3 - 6 months depending on operating conditions. bearing greases must be compatible with the type of gear lubricant being used (i.e. mineral, synthetic, food grade, etc.). For mineral oils, use a high quality lithium base NLG01 #2 bearing grease. For synthetic oils, use a synthetic bearing grease such as Mobil Synthetic Universal grease, Mobilith SHC 100 or a suitable equivalent. For food grade lubricants, use Chevron FM grease, NGLI 2, or equivalent.

Low input speeds (under 1600 RPM): When input speeds are less than 1600 RPM, grease fittings will be required to lubricate any bearings not partially covered by the normal oil level.

Oil temperature: Speed reducers in normal operation can generate temperatures up to 200°F depending on the type of reducer and the severity of the application loading, duration of service, ambient temperatures). Excessive oil temperatures may be the result of several factors including overloading, overfilling, under filling or inadequate cooling.

Nominal Ratio

Size	5	7.5	10	15	20	25	30	40	50	60	80	100
920	0.347	0.263	0.225	0.216	0.202	0.191	0.215	0.200	0.188	0.182	0.164	0.161

Lubricant selections are provided by the lubricant manufacturer based on AGMA recommended viscosity grades. Viscosity grades are based on Lubrication Standard ANSI/AGMA 9005-D94.

4.0 TROUBLESHOOTING SECTION

DISHMACHINE COMMON PROBLEMS



WARNING: Inspection, testing and repair of electrical equipment should only be performed by a qualified service technician. Many of the tests require that the unit have power to it and live electrical components be exposed.
USE EXTREME CAUTION WHEN TESTING THE MACHINE.

Problem: Nothing on dishmachine operates. The power switch is ON and the power indicator light is OFF.

1. Machine is not wired correctly to incoming power source. Have an electrician verify wiring.
2. Machine circuit breaker is tripped. Reset the circuit breaker. If it trips again, contact an electrician to verify the machine amp draw.
3. Service breaker is tripped. Reset the service breaker. If it trips again, contact an electrician to verify the machine amp draw.

Problem: Machine will not fill. The power switch is ON and the power indicator light is ON.

1. No water supply to machine. Verify that water lines have been connected to the machine.
2. Dishmachine doors are not closed. Close doors completely.
3. Incoming water solenoid valve damaged/faulty. Verify that the valve is operating.
4. Tank floats faulty. Verify the wiring of the floats. Verify that no debris is jamming the floats.

Problem: Machine fills, but fill is weak.

1. Low incoming water pressure. Verify that incoming water pressure during fill is 20 ± 5 PSI.
2. Incoming water solenoid is clogged. Verify that debris is not entrapped in valve. If so, remove debris.

Problem: Low wash tank temperature.

1. Low incoming water temperature. Verify that the incoming water temperature matches what is indicated on the machine data plate.
2. Heater not energizing. Verify that the wash tank heater is operating.
3. Low incoming voltage. Have an electrician verify that the power coming to the machine is the same as indicated on the data plate.

Problem: Low wash arm pressure, poor spray pattern.

1. Clogged wash arm nozzles. Verify that nozzles are not clogged with debris. If so, remove debris.
2. Clogged wash tank or wash pump strainers. Clean out strainers if necessary.
3. Worn wash pump impeller. Verify status of impeller, replace if necessary.

Problem: Low prewash arm pressure, poor spray pattern.

1. Clogged prewash arm nozzles. Verify that nozzles are not clogged with debris. If so, remove debris.
2. Clogged prewash tank or prewash pump strainers. Clean out strainers if necessary.
3. Worn prewash pump impeller. Verify status of impeller, replace if necessary.

Problem: Inadequate rinse.

1. Low incoming water pressure. Verify that incoming water pressure during fill is 20 ± 5 PSI.
2. Incoming water solenoid is clogged. Verify that debris is not entrapped in valve. If so, remove debris.

Problem: Pawl bar moves with no load, but does not move when loaded.

1. Clutch on drive assembly is out of adjustment. Adjust as required

Problem: Pawl bar does not move.

1. Failed or broken overload spring. Replace spring if necessary.
2. No power to the drive motor/failed drive motor. Verify power and wiring connections to the motor.
3. Pawl bar not properly installed. Verify that the pawl bar is installed correctly.

Problem: Racks go through the machine, but results are poor.

1. Verify that detergent is being dispensed into the machine at the appropriate quantities for the water volume. If not, get detergent to appropriate level and review results of washing ware.
2. Clogged strainers/scrap basket. Clean out strainers and scrap basket and replace.
3. Ware not being properly pre-scraped. Review paragraph entitled "Ware Preparation" in the operating instructions.
4. Wash or rinse arms missing end plugs or caps. Verify and replace as required.
5. Low tank heat (see previous page).
6. Inadequate rinse (see previous page).

4.0 TROUBLESHOOTING SECTION

7. Incorrect voltage coming to the machine. Verify that the voltage matches that on the machine data plate.
8. Wash pump cavitation due to low water level. Verify that the drains are shut and that the water level is correct.

Problem: Spotting of silverware, glasses and dishes.

1. Incorrect final rinse temperature. Verify that the rinse water temperature matches that which is listed on the machine data plate.
2. Clogged wash and/or rinse nozzles and arms. Remove the arms and verify that they and their nozzles are free from debris.
3. Excessively hard water. Install a water softener to reduce hardness.
4. Loss of water pressure due to clogged/obstructed wash pump. Turn the power off to the machine at the source. Drain the wash tank of water and verify that the pump intake is free from debris.
5. Improper scrapping procedures. Review the paragraph entitled "Ware Preparation" in the operating instructions.
6. Incorrect detergent/chemical concentrations. Verify that the detergent/chemical concentrations are correct for the associated water volume.

5.0 SERVICE PROCEDURES

REPLACING THE PUMP GASKET & SEAL

These rack conveyor machines come equipped with powerful motors and pumps to ensure ware washing results. Occasionally, some of the parts on these components may need replacing to maintain optimum performance. Two components in particular are the wash pump gasket and the mechanical seal.

The instructions provided here are for maintenance personnel only. Unauthorized persons should not attempt any of the steps contained in these instructions.

Warning: many of the instructions and steps within this document require the use of tools. Only authorized personnel should ever perform any maintenance procedure on the dishmachine!

PREPARATION

1. Power must be secured to the unit at the service breaker. Tag or lock out the service breaker to prevent accidental or unauthorized energizing of the machine.
2. Ensure that incoming water to the machine is secured either by use of a shut-off valve or disconnecting the incoming water line.
3. Ensure that the dishmachine has been completely drained of water and has been allowed to cool before beginning this maintenance procedure.

TOOLS REQUIRED

The following tools will be needed to perform this maintenance evolution:

1. 7/16" socket and ratchet with extension
2. 9/16" socket and ratchet with extension
3. 5/16" Allen wrench
4. 5/16" nut driver
5. Large flathead screwdriver

TIME REQUIRED

It is estimated that it will take (1) person one and a half hours to perform this task, not including all of the items indicated in the section entitled "PREPARATION".

IMPORTANT NOTES

1. Read these instructions thoroughly before attempting this maintenance procedure. Become familiar with the parts and what actions need to be taken. This will save time in the long run!
2. The procedures demonstrated in this manual

are shown being performed on an ES-4400 rack conveyor dishmachine. The actual maintenance steps, however, apply to any wash, prewash or power rinse motor found on an Ecolab rack conveyor dishmachine.

STEPS

1. Note: in this procedure, it is not necessary to always remove the wiring from the motor. However, the motor should be treated with the greatest of care when being pulled away and set on the floor for maintenance, as demonstrated in these instructions.
2. Remove the (4) nuts holding the mounting plate in position.



Removing the mounting plate nuts with the 9/16" socket

3. Loosen the band clamp on the back end of the motor.



Loosening the band clamp on the back end of the motor.

4. With the band clamp loosened, carefully remove it from the back end of the motor. Once the clamp is removed, examine it to determine if it needs to be replaced as well. If it is broken in any spots or shows signs of metal fatigue, it is best to order a new one. The purpose of the clamp and the attached support bracket is to keep the weight of the motor from pulling on the tub, damaging it. It is absolutely necessary that this component be replaced once the maintenance procedure is completed.

5.0 SERVICE PROCEDURES

REPLACING THE PUMP GASKET & SEAL CONT.:



Removing the rear clamp

5. Remove the motor support bracket.



Removing the motor support bracket

6. With the motor support bracket removed, gently pull back on the motor. You may have to move it from side to side, but it should start to move back. Pull it completely away from the mounting studs on the tub and set down gently to work on it.

7. Remove the gasket from the tub. If you are going to replace it with a new one, do so at this time. Otherwise, carefully examine the gasket for tears and other damage. If it is acceptable, set to the side. If you are not going to replace the seal, go to step 16.



Removing the pump gasket

8. Using a large screwdriver (flathead preferred, but a phillips head will work just as well) and the 7/16" socket, loosen and then remove the bolt holding the impeller to motor shaft. Refer to the picture below.



Removing the bolt that holds the impeller to the shaft

9. With the bolt and washer removed, grasp the sides of the impeller and pull up gently. The impeller should slide off of the shaft. Remove the woodruff key as well and set to the side



Removing the impeller

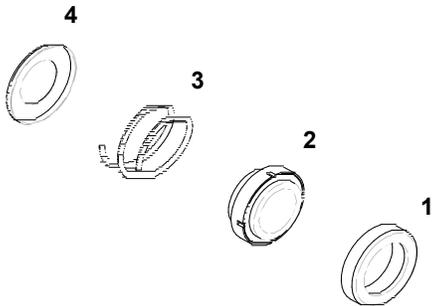


Removing the woodruff key

5.0 SERVICE PROCEDURES

REPLACING THE PUMP GASKET & SEAL CONT.:

10. Note that the mechanical seal will consist of the following parts:



1. A rubber seal with a ceramic ring set inside it that will seat in the center of the mounting plate.
2. A rubber seal with a stainless steel covering on the outside that seals the motor shaft and seats against the ceramic ring.
3. A spring.
4. A stainless steel spring cap to capture the top of the spring and hold it in place.

11. Most of the mechanical seal should simply come off, leaving the rubber seal with the ceramic ring inside the pump mounting plate.

12. Using a screwdriver, pry out the remaining part of the mechanical seal, taking care not to score or damage the motor shaft.

13. Once the hole is free of any parts of the mechanical seal, verify that the hole is clean and free of debris.

14. Gently press the new seal and ceramic over the shaft and slide down into the mounting plate hole.

NOTE: Do not touch the surface of the seal with your bare fingers; place a rag or paper towel between your fingers and the seal. Gently slide the shaft seal over the shaft and push it down against the mounting plate seal. Place the spring and cap over the shaft.

15. Place the woodruff key back into the groove of the motor shaft and re-install the impeller, being careful to align the woodruff key with the slot in the impeller. Replace the bolt and washer, and then tighten.

16. Install the motor by placing it on the studs and sliding it forward until it is against the wash tank wall. Replace the nuts and washers and tighten.

17. Re-install the pump motor support bracket and tighten down the nuts used to secure it to the tub.

18. Replace the band clamp on the motor and support bracket, tighten until snug.

AFTER MAINTENANCE ACTIONS

Reconnect the incoming water (if disconnected) and turn on. Then restore power to the unit. Run the unit for at least 10 minutes to ensure there are no leaks. If you hear any grinding sounds while the motor is running, immediately shut off the unit and secure power and water. There is a serious problem that must be addressed. If any problems arise you can contact your Ecolab representative.

SPECIAL PARTS

Mechanical Seal
Ecolab No.: 96563812

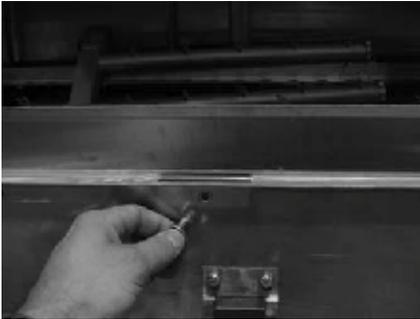
Motor Mounting Gasket
Ecolab No.: 96020060

Motor Support Clamp
Ecolab No.: 96021852

5.0 SERVICE PROCEDURES

RACK RAIL STABILIZER KIT

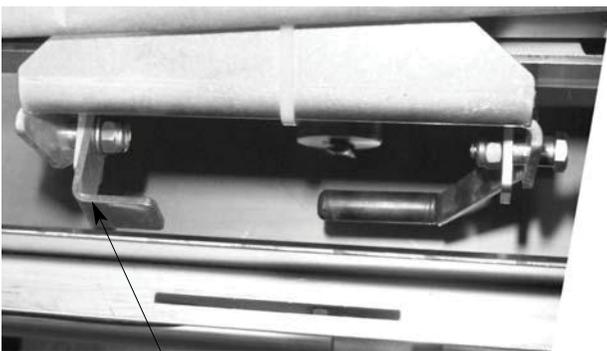
First, remove three bolts, locknuts and flat washers at middle hood/tub junction.



Next, remove door splash shield.



Then, install the stabilizer using the three bolts, locknuts and flat washers.



Rack Rail Stabilizer
Ecolab No.: 96582986

RINSE SOLENOID VALVE REPAIR PARTS KIT

These dishmachines are equipped with electrical solenoid valves to allow for automatic fill and rinse. These valves are designed to specific tolerances and design aspects that must be met in order to function properly.

Ecolab offers repair kits for replacing some of the wear items associated with solenoid valves which will allow you to save money in that replacement of these parts can take place without removing the solenoid valve from the plumbing assembly.

The instructions provided here are for maintenance personnel only. Unauthorized persons should not attempt any of the steps contained in these instructions.

WARNING



Many of the instructions and steps within this document require the use of tools. Only authorized personnel should ever perform any maintenance procedure on the dishmachine!

PREPARATION

1. Power must be secured to the unit at the service breaker. Tag or lock out the service breaker to prevent accidental or unauthorized energizing of the machine.
2. Ensure that incoming water to the machine is secured either by use of a shut-off valve or disconnecting the incoming water line.

TOOLS REQUIRED

The following tools will be needed to perform this maintenance evolution:

1. Small flathead screwdriver
2. Medium flathead screwdriver
3. Needle nose pliers
4. 5/16" nut driver
5. Channel locks
6. 12" pipe wrench

TIME REQUIRED

It is estimated that it will take (1) person twenty minutes to perform this task, not including all of the items indicated in the section entitled "PREPARATION".

IMPORTANT NOTES

1. Read these instructions thoroughly before attempting this maintenance evolution. Become familiar with the parts and what actions need to be taken. This will save time in the long run!

5.0 SERVICE PROCEDURES

Rinse/Fill Solenoid Valve Repair

The procedures demonstrated in this manual are shown being performed on an ES-4400 rack conveyor dishmachine. The actual maintenance steps, however, apply to any Parker style solenoid valve found on a Ecolab dishmachine.

STEPS

1. Remove the top screw with the 5/16" nut driver. Remove the screw and the data plate and set to the side.



Removing the top screw

2. With the top screw and data plate removed, grasp the solenoid coil and gently pull up. The coil should slide up, allowing you to remove it from the valve bonnet. If you are wanting to replace the coil, continue on with Step 3. If you are wanting to replace some of the internal components of the valve, proceed to step 12.



Removing the coil

3. NOTE: Replacing the solenoid coil requires working with the wiring of your machine. It is important that all wiring maintenance be performed by qualified personnel. Always verify the wiring steps presented in this instruction with the schematic that shipped with the unit. A current schematic can also be found in the unit's installation manual. Before beginning any

step that involves working with wiring, ensure that the steps located in the section entitled "Preparation" have been performed. Power must be secured to the machine at the service breaker. Failure to do so could result in severe injury to maintenance personnel.



Prying open the coil wire cover

4. When replacing the coil, ensure that when removing the coil wire cover that care is taken not to damage the wires inside. Using the medium flathead screwdriver, gently use it to open the cover enough to where it could be pulled off.



Straightening the wires

5. Once the coil wire cover has been removed and set to the side, take the internal wires and pull them out straight.



Removing the wire nuts

6. Remove the wire nuts from the wires and separate them.

5.0 SERVICE PROCEDURES



Loosening the conduit nut

7. Using a pair of channel locks, gently loosen the conduit retaining ring for the conduit nut. Once it is loosened, use your fingers to unscrew and remove it.
8. Pull the conduit away and discard the bad coil. Take the new coil and attach the conduit, reinstall & tighten the conduit nut, and pull the wires through so that you will be able to wire the valve back up.
9. Reconnect the wires from the conduit to the wires from the solenoid as they had been connected previously. Ensure that the wire nuts are on tight.
10. Slide the coil wire cover back on, taking care not to damage the wires.
11. If you are done performing maintenance on the valve, continue on to step 23. Otherwise, please go on to step 12.



Loosening the valve bonnet

12. To remove the valve bonnet, grasp it with the jaws of the pipe wrench and turn to the left. Note: on some models you may have to remove the valve in order to perform this and any further steps. Be careful not to damage the plumbing assembly. Only use the pipe wrench enough to where you can spin the valve bonnet off with your hand.



Removing the valve bonnet

13. Slowly remove the valve bonnet. Note: The spring for the plunger is located directly under the bonnet and may come free if you are not careful. Remove the plunger, spring and valve bonnet and place to the side.



Removing the O-ring

14. Remove the O-ring and inspect it. If it has any tears or cuts or excessive flat spaces, it should be replaced.
15. Examine the threads for the valve bonnet. Check them for scoring or signs of damage. Take a cloth and clean them out to remove any foreign particles that might get lodged in the threads and cause a leak. Severely damaged threads should not be repaired; instead it is recommended that the entire valve should be replaced. These instructions do not provide information on replacing the solenoid valve.
16. Note: Even though an O-ring may not appear damaged, it is a good idea to go ahead and replace it if you have a new one. This will help ensure that your valve remains leak-free in the future

5.0 SERVICE PROCEDURES



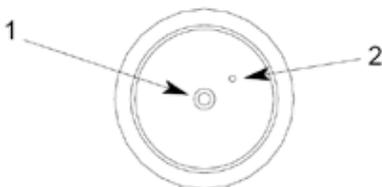
Removing the diaphragm

17. Remove the diaphragm retainer and then the diaphragm itself. Many problems associated with a solenoid valve can be traced to a clogged pilot port in the diaphragm.



Pointing out the extension hole

18. As indicated in the photo above, the extension hole can become clogged. If it is difficult to clean out, you can use a heated straight pin to push through the hole. The center hole, the pilot port, must also be clear. If the diaphragm is torn or bent in any way, it must be replaced.



Diaphragm showing (1) pilot port and (2) extension hole



Removing the screen retainer

19. Using the small flathead screwdriver, lift out the screen retainer. Verify that the holes in it are free of clogs and debris.



Removing the mesh strainer screen

20. Again using the small flathead screwdriver, carefully remove the mesh screen from inside the valve body. The screen should be taken and rinsed out to remove any debris fouling it.



5.0 SERVICE PROCEDURES

21. With the mesh screen removed, look down into the valve and verify it is not clogged. Remove any foreign objects from the valve body that would obstruct flow.

22. Reassemble the valve, reversing the steps needed to take it apart. Replace defective replacement parts with new parts from ordered kits. Ensure that components are sufficiently tightened to prevent leakage.

AFTER MAINTENANCE ACTIONS

Reconnect the incoming water (if disconnected) and turn on. Then restore power to the unit. Run the unit for at least 10 minutes to ensure there are no leaks. If any problems arise please contact your Ecolab representative.

SPECIAL PARTS

Repair kit includes: Plunger, Spring, O-ring, and Diaphragm.

1/2" Repair Kit
Ecolab No.: 85283489

3/4" Repair Kit
Ecolab No.: 85283406

110/240 Volt Coil & Housing Only
Ecolab No.: 85289411

1/2" 110/240 Volt Solenoid Valve Complete Assembly
Ecolab No.: 96580683

3/4" 110/240 Volt Solenoid Valve Complete Assembly
Ecolab No.: 85260511

VACUUM BREAKER REPAIR PARTS KIT

These dishmachines are equipped with vacuum breakers to serve as back-flow prevention devices. ASSE requirements specify what type of back-flow prevention is necessary on dishmachines. Vacuum breakers, unlike air gaps, have certain parts that have specific tolerances and design aspects that must be met in order to function properly.

Ecolab offers repair kits for replacing some of the wear items associated with vacuum breakers which will allow you to save money in that replacement of these parts can take place without removing the vacuum breaker from the plumbing assembly. The instructions provided here are for maintenance personnel only. Unauthorized persons should not attempt any of the steps contained in these instructions.

Warning: many of the instructions and steps within this document require the use of tools. Only authorized personnel should ever perform any maintenance procedure on the dishmachine!

PREPARATION

1. Power must be secured to the unit at the service breaker. Tag or lock out the service breaker to prevent accidental or unauthorized energizing of the machine.
2. Ensure that incoming water to the machine is secured either by use of a shut-off valve or disconnecting the incoming water line.

TOOLS REQUIRED

The following tools will be needed to perform this maintenance evolution:

1. Small flathead screwdriver
2. Needle nose pliers

TIME REQUIRED

It is estimated that it will take (1) person twenty minutes to perform this task, not including all of the items indicated in the section entitled "PREPARATION".

IMPORTANT NOTES

1. Read these instructions thoroughly before attempting this maintenance evolution. Become familiar with the parts and what actions need to be taken. This will save time in the long run!

5.0 SERVICE PROCEDURES

STEPS

1. **Note:** These instructions only apply to vacuum breakers (1/2" NPT and 3/4" NPT) as pictured below. The repair kits indicated in these instructions will only work on those style of back-flow preventers. If you have a machine with a different style of vacuum breaker, contact your Ecolab representative about replacement components.



Vacuum breaker

2. Note: Even though the photos in these instructions show a vacuum breaker that has been removed from the plumbing assembly, these maintenance steps could be performed with it installed so long as the requirements in the section entitled "PREPARATION" have been met.

3. Remove the top cap by gripping firmly and turning to the left. The cap should come off after a few turns.



Removing the cap

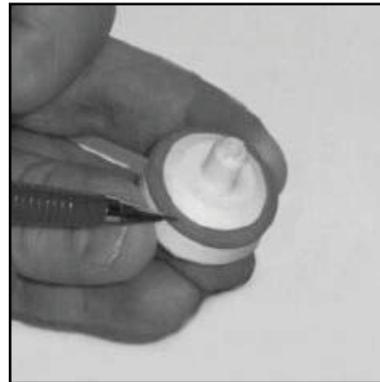
4. Set the cap to the side.

5. Using the needle nose pliers, gently lift out the plunger and set to the side. Examine the brass seating surface inside the vacuum breaker. The plunger is required to sit flat on this surface so it must be free of defects, imperfections and the like. If there is debris, remove it. If it is chipped or cracked then the vacuum breaker must be replaced. Failure to do so may result in the vacuum breaker not working according to its design and could result in damage to the dishmachine.

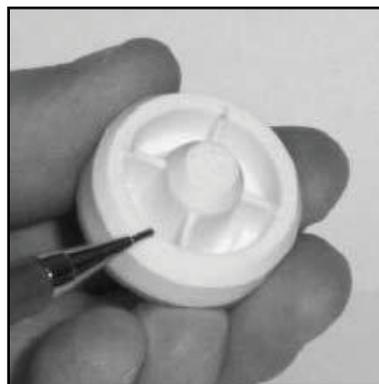


Removing the plunger

6. Your repair kit comes with a new plunger. Examine the old one and ensure that the mating surface is not damaged or cut. Also inspect the rubber seal on the top of the plunger to ensure it is in good condition and not torn.



Examining the seal ring on the plunger



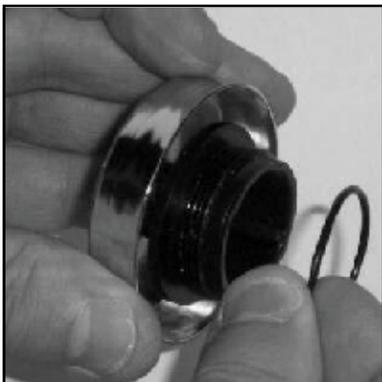
Examining the plunger seating surface

5.0 SERVICE PROCEDURES

7. If any of these conditions are present, replace the old plunger with the new one from your kit. Verify that the new plunger is also free from defects. If it is not, contact your Ecolab representative immediately.

8. The plunger should drop into the vacuum breaker and seat. Ensure it is not flipped upside down (the orange seal ring should be up towards the top of the vacuum breaker).

9. Pick up the cap and examine it. With a soft towel, remove any grit, grime or debris that may have gotten caught in the threads of both the cap retainer or the vacuum breaker body. There is an O-ring that should be present on the cap retainer as well. Regardless of the condition of the plunger, this O-ring should be replaced once the cap is removed. Using a small flathead screwdriver, remove the old O-ring.



Replacing the O-ring

10. With the new O-ring in place, screw the cap back on the vacuum breaker body. The cap needs to only be hand tight (snug).

AFTER MAINTENANCE ACTIONS

1. Reconnect the incoming water (if disconnected) and turn on. Then restore power to the unit. Run the unit for at least 10 minutes to ensure there are no leaks. If any problems arise please contact your Ecolab representative.

SPECIAL PARTS

To order the kit with components and instructions:

Components of 1/2" Repair Kit
Ecolab No.: 85284156

Components of 3/4" Repair Kit
Ecolab No.: 85284164

DRIVE MOTOR/GEAR REDUCER REPLACEMENT

The drive motor and the gear reducer of your Ecolab rack conveyor are responsible for moving racks of ware through the dishmachine. If needed to be replaced, these instructions will show you how to get your machine up and running in the shortest possible time.

Ecolab offers all of the repair parts necessary for performing this task.

The instructions provided here are for maintenance personnel only. Unauthorized persons should not attempt any of the steps contained in these instructions.

Warning: many of the instructions and steps within this document require the use of tools. Only authorized personnel should ever perform any maintenance procedure on the dishmachine!

PREPARATION

1. Power must be turned off to the unit at the service breaker. Tag or lock out the service breaker to prevent accidental or unauthorized energizing of the machine.

TOOLS REQUIRED

The following tools will be needed to perform this maintenance evolution:

1. 7/16" socket and ratchet with extension
2. 9/16" socket and ratchet with extension
3. 7/16" combination wrench
4. 9/16" combination wrench
5. 3/4" combination wrench
6. 1/8" Allen wrench
7. 1/4" nut driver
8. Large flathead screwdriver
9. Medium phillips head screwdriver
10. Medium hammer
11. Rubber mallet

TIME REQUIRED

It is estimated that it will take (1) person one and a quarter hours to replace the drive motor, one and a quarter hours to just replace the gear reducer or two hours to do both at one time, not including all of the items indicated in the section entitled "PREPARATION"

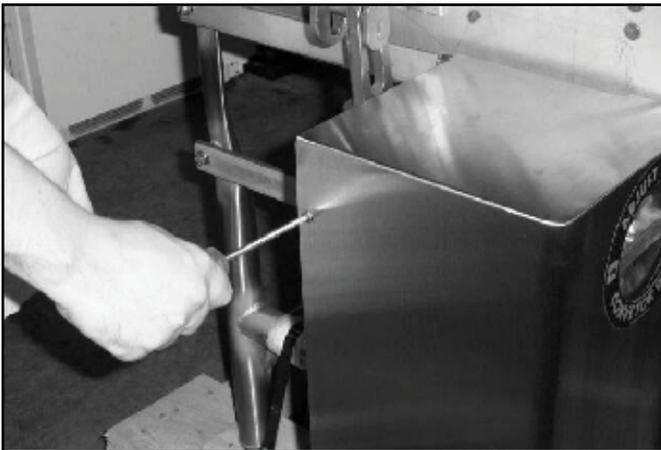
5.0 SERVICE PROCEDURES

IMPORTANT NOTES

1. Read these instructions thoroughly before attempting this maintenance procedure. Become familiar with the parts and what actions need to be taken. This will save time in the long run!
2. The procedures demonstrated in this manual are shown being performed on an ES-4400 rack conveyor dishmachine. The actual maintenance steps, however, apply to any drive motor or gear reducer found on a Ecolab rack conveyor dishmachine.

STEPS

1. Remove the (2) screws that secure the top drive assembly cover in place.



Removing the screws from the top cover.

2. Remove the top cover to expose the drive assembly.



Removing the top cover.

3. Set the top cover to the side and out of the way so that it does not become a trip hazard. From here, the next step will be to remove the bottom cover. This will require using the 7/16" socket with ratchet and most likely the 7/16" combination wrench. Do not lose the hardware for the covers as your repair kits do not come with the hardware necessary to replace these. If you do require hardware that is not present in your kits, do not hesitate to contact Ecolab for help.



Removing the nuts securing the bottom cover.



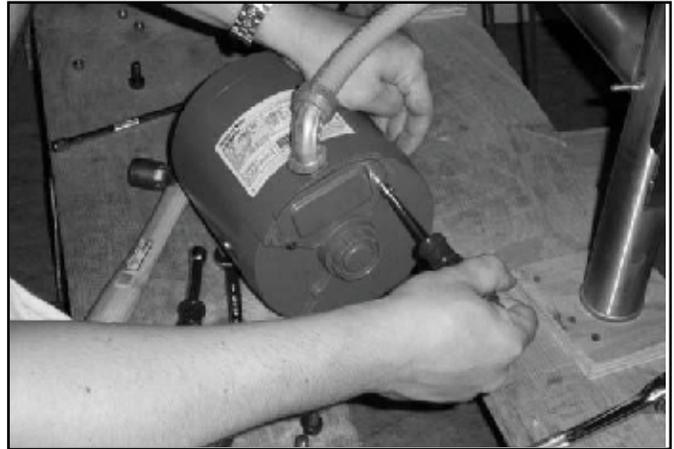
Removing the bottom cover.

4. Remove the bottom and set to the side so that it does not become a trip hazard.

5.0 SERVICE PROCEDURES



Removing the bolts holding the drive motor to the gear reducer.



Removing the wiring access cover.

5. With the cover removed you may now remove the bolts used to connect the drive motor to the gear reducer. Note: you need to support the motor as you remove the bolts; failure to do so could result in the motor falling to the ground and becoming damaged.



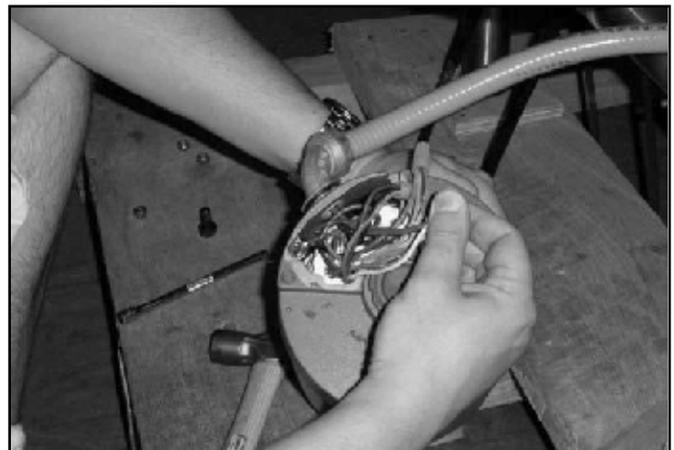
Removing the drive motor.

6. Once the bolts are removed, the motor should slide out of the gear reducer. Remember to support and lay it gently on the floor or some other surface in order to continue working on it. Be sure that you get the key, checking the keyway on the motor shaft and in the gear reducer.

7. If the purpose of this maintenance action is to replace the drive motor, continue to step 8. If you wish to replace the gear reducer, continue to step 21.

8. With the motor laying on a level surface, you need to remove the conduit from it. First, use the 1/4" nut driver to remove the wiring access cover on the back of the motor.

9. Once the cover is removed and the wiring is exposed, you may want to jot down how your motor is wired. You can also refer to the schematic located on the motor itself because how the motor is wired when you remove it is how you will wire it when you replace it. If you have any questions regarding the wiring of your motor, do not hesitate to contact Ecolab for help.



Removing the wire nuts.

5.0 SERVICE PROCEDURES

10. pull the bundled wires out and remove the wire nuts. Set the wire nuts to the side as you will need them when you wire up the new motor.

11. Once the wire nuts are removed, separate the wires.

12. With the flathead screwdriver and the hammer, loosen the conduit nut. Once loosened, pull the conduit away from the motor. The motor may now be disposed of.

13. Remove the access cover off of the new motor.

14. Attach the conduit and pull the wires through the hole provided. Tighten the conduit nut.

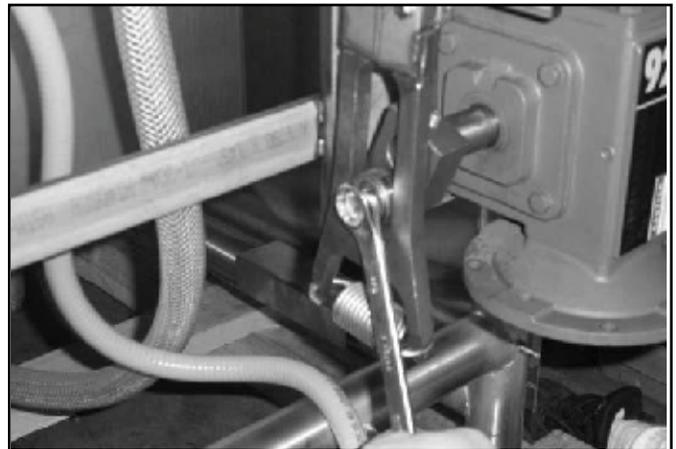
15. Using the wire nuts, wire the motor back the same way the old one had been. Refer to the schematic on the motor itself or contact Ecolab if you any questions.

16. Once the wiring is done, carefully push wires back into the motor and put the access cover back on. Tighten down the screws for securing it.

17. The drive motor now needs to be reattached to the gear reducer. There are two methods for doing this. The first is to try and reinsert the drive motor shaft into the gear reducer with it (gear reducer) still attached to the unit. This is difficult but possible. Ensure that the key is in the keyway when you mate the parts. The second method and perhaps the easiest is to remove the gear reducer, mate the two parts and bolt them together and then put them on the unit at one time. This method takes a little more time. If you wish to remove the gear reducer and assemble the two components continue on to step 27.



The Correct way to mount the drive motor.



Removing the drive hub bolt.

18. Once the motor and gear reducer are mated, secure them with the locknuts and bolts. Ensure the bolts are tight.



The WRONG way to mount the drive motor.



Loosening the set screw with the 1/8 allen wrench.

5.0 SERVICE PROCEDURES



Removing the nuts holding the gear reducer on.



Removing the drive hub.



Removing the gear reducer.

Note: Because of the way the covers for the drive assembly are designed, it is imperative that you position the motor on the gear reducer so that the conduit fitting is facing towards the front of the dishmachine. If it is facing away from the machine, the covers may not go back on.

19. Reattach the bottom and top drive assembly covers.

20. Proceed to the sections entitled "AFTER MAINTENANCE ACTIONS".

21. (Continuing from step 7) To remove the gear reducer, first take the 3/4" combination wrench and remove the drive hub bolt.

22. Once the drive hub bolt & bearing are removed, loosen the set screw on the drive hub. There is no need to remove it.

23. Remove the gear drive by using the 9/16" socket and ratchet, as well as the combination wrench as required, to remove the nuts holding it to the mounting plate.

24. Gently remove the gear reducer, careful not to drop it.

25. Set the gear reducer on a flat surface. The drive hub needs to be removed. You have already loosened the set screw, but it may take some more effort to remove it. You may pry it off, or give it some taps with a mallet to coax it off of the shaft. The liberal use of spray lubricants will also help.

26. Once the drive hub is removed, place it on the shaft of the new gear reducer. Ensure the key is in the keyway. Once it is on and flush with the end of the shaft, tighten down on the set screw with the 1/8" allen wrench.

27. As you have both the drive motor and the gear reducer off of the machine, it is much simpler to assemble them together prior to mounting them. Ensuring that the key for the drive shaft of the drive motor is in the keyway.

5.0 SERVICE PROCEDURES

28. After the motor is mated against the gear reducer, turn the motor so that the conduit fitting will face towards the front of the dishmachine once both components are mounted to the frame. This is to all the drive assembly covers to go back on. If you do not do this, then there is a possibility the covers will not fit back on the unit. Refer to step 18 and the note following for more details.

29. Stand the assembly up and secure them using the lockwashers and bolts. Use the 9/16" combination wrench to tighten them down.



Mounting the motor to the gear reducer.



Tightening the bolts to secure the drive motor to the gear reducer.

30. Once the motor is securely fastened to the gear reducer, carefully lift the assembly up and mount it on the fasteners. Be sure to use proper lifting techniques to prevent injury.

31. Once mounted, secure with the lock washers and locknuts.

32. Reinstall the drive hub bearing and drive hub bolt, tightening down with the 7/8" combination wrench.

33. Reattach the bottom and top assembly covers.

AFTER MAINTENANCE ACTIONS

Reconnect the incoming water (if disconnected) and turn on. Then restore power to the unit.

Run the unit for at least 10 minutes, running an empty rack through the machine to ensure that it is carried all of the way through. If you hear any grinding sounds while the motor is running, immediately shut off the unit and secure power and water. There is a serious problem that must be addressed. If any problems arise you can contact your Ecolab representative.

5.0 SERVICE PROCEDURES

REPLACING THE WASH HEATER

Ecolab rack conveyor machines come equipped with heaters to ensure proper ware washing results. Occasionally, some of these components may need replacing to maintain optimum performance.

Ecolab offers all of the repair parts necessary for performing this task.

The instructions provided here are for maintenance personnel only. Unauthorized persons should not attempt any of the steps contained in these instructions. Warning: many of the instructions and steps within this document require the use of tools. Only authorized personnel should ever perform any maintenance procedure on the dishmachine!

PREPARATION

1. Power must be secured to the unit at the service breaker. Tag or lock out the service breaker to prevent accidental or unauthorized energizing of the machine.
2. Ensure that incoming water to the machine is secured either by use of a shut-off valve or disconnecting the incoming water line.
3. The unit must be drained completely.

TOOLS REQUIRED

The following tools will be needed to perform this maintenance evolution:

1. 3/8" Nut driver
2. Ratchet
3. 1/2" Socket
4. 3/8" Socket
5. Phillips head Screwdriver
6. Needle nose Pliers
7. Torque Wrench
8. Silicone Sealant
9. Amp Meter

TIME REQUIRED

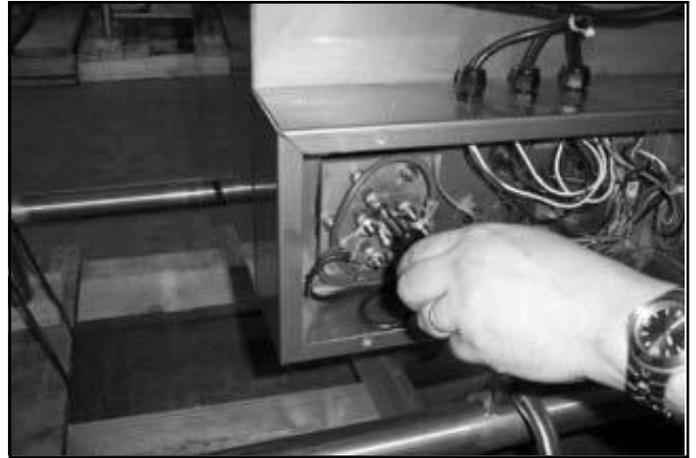
It is estimated that it will take (1) person ninety minutes to perform this task, not including all of the items indicated in the section entitled "PREPARATION".

IMPORTANT NOTES

1. Read these instructions thoroughly before attempting this maintenance task. Become familiar with the parts and what actions need to be taken. This will save time in the long run!

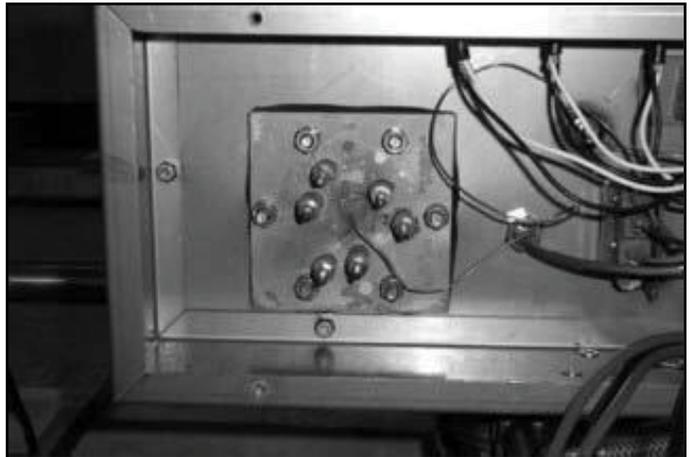
STEPS

1. Remove the front dress panel.
2. Remove the heater box cover to expose the heater. Set the cover and hardware to the side.



Removing the power lines.

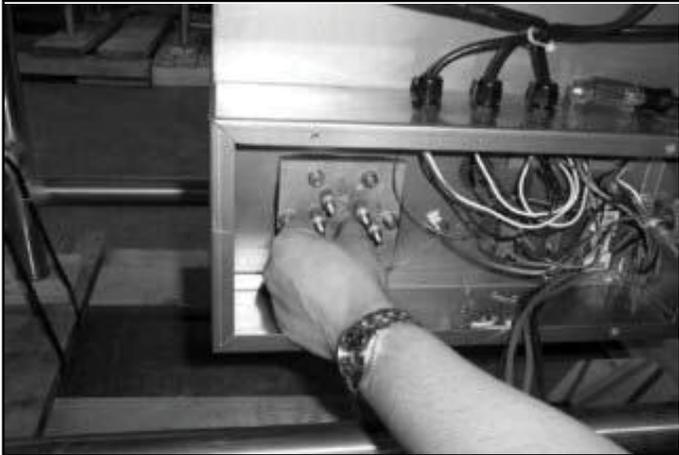
3. Remove the incoming electrical lines from the heater. Set the hardware to the side.



Heater without power lines attached.

4. Push the incoming electrical lines out of the way.
5. The thermostat probe needs to be removed from the well inside the heater. The probe is secured in place with silicone that must be peeled away prior to attempting to remove it. It is important that you do not damage the probe during this part of the maintenance action. If you do, then the thermostat will have to be replaced as well.

5.0 SERVICE PROCEDURES



Removing silicone from thermostat well

6. Using your hand or needle nose pliers, remove the silicone so that the thermostat probe may be gently removed.



Removing the nuts and lock washers



Removing the heater



Removing the gasket

7. With the thermostat probe out of the way, use the 1/2" socket and ratchet to remove the nuts holding the heater to the tub. Remove all nuts and lock washers.

8. Remove the heater from the tub weldment.
9. Remove the gasket.



Applying the torque wrench to the nuts

10. Before proceeding any further, it is important to verify that the tub wall is free of any excess debris so that when the new gasket is applied, there are no gaps that could lead to leaking around the heater.

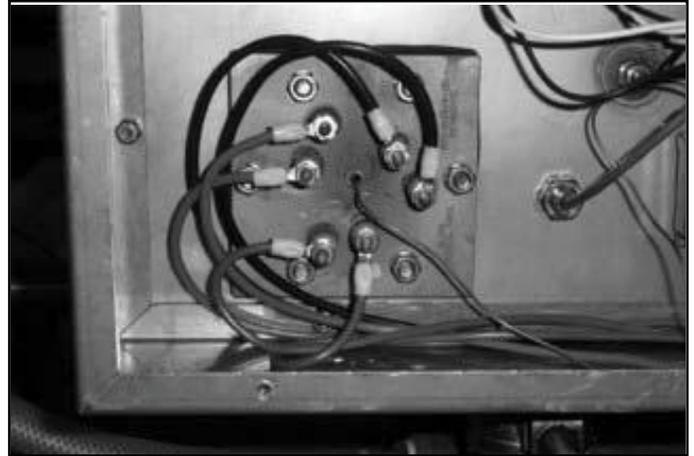
11. Apply the new heater gasket from your service kit. Removing the heater

12. Slide the heater onto the studs and apply by hand the lockwashers and nuts. Tighten the nuts by hand and then use the torque wrench set to 70 in-lbs to ensure that the nuts are secure.

5.0 SERVICE PROCEDURES



Putting the thermostat probe in the heater well



Three phase wiring

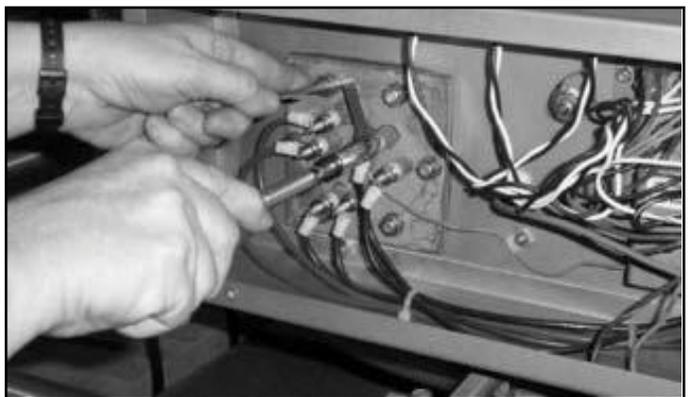


Applying silicone to the heater well

13. The thermostat probe needs to be placed into the well of the new heater. Again, use caution when doing this so that the probe or the capillary tube do not become broken. If this occurs, then the thermostat will have to be replaced.

14. Apply silicone to seal the well and hold the thermostat probe in place.

15. Reattach the incoming power lines to the heater, ensuring that you wire the heater correctly for either single or three phase operation.



Tightening the nuts holding the power lines



Single phase wiring

16. Using the torque wrench or a torque nut driver (if available) torque the nuts holding the wires, jumpers and bus bars to 16 in-lbs. Single phase wiring

17. Ensuring that all non-essential personnel are clear of the area, close the drain valve(s) and restore power and water to the unit. Turn the unit on and allow it to fill normally.

5.0 SERVICE PROCEDURES

18. Verify that there are no leaks around the heater. If there are, attempt to tighten it down as the tub will change shape slightly as it heats up.
19. Use the amp meter to take readings off of the power lines to the heater, verifying the amperage draw to the machine data plate.
20. Wait until the heater contactor kicks out (meaning that the tub has reached the appropriate temperature) and place the unit in DELIME mode by flipping the switch on the back of the control box. Allow the unit to operate for at least ten minutes to verify that there are no leaks and that the heater is maintaining the tank temperature.
21. If the unit appears to be operating correctly, return it to AUTO mode and turn off.
22. Replace the heater box cover.
23. Replace the front dress panel.

AFTER MAINTENANCE ACTIONS

Service personnel may want to drain the machine and allow it to cool down. Secure power to the unit at the service breaker and then verify the torque of all fasteners covered in this instruction.

5.0 SERVICE PROCEDURES

Reversible Drive Modification Instructions: Changing Drive Motor Assembly from Left to Right Side of Machine

The EC44-LW dishmachine has the ability to have the location of the drive motor assembly to be changed from the left to the right side, or from the right to the left side.

Changing the location can be a useful means of getting the dishmachine to fit into constricted areas. These changes can be made in the field; however, it is highly recommended that they are made before the dishmachine is placed in its final location.

Warning: many of the instructions and steps within this document require the use of tools. Only authorized personnel should ever perform any maintenance evolution on the dishmachine!

PREPARATION

1. Perform this modification before the machine is connected to any source, such as water or electricity.

TOOLS REQUIRED

1. Philips head screwdriver
2. 7/16" Socket with drive ratchet and 6" or larger extension
3. 9/16" socket with drive ratchet
4. 7/16" combination wrench
5. Vice Grips
6. Torque Wrench (Recommended)

TIME REQUIRED

It is estimated that it will take (1) person one and one half hours to perform this task, not including all of the items indicated in the section entitled "PREPARATION".

IMPORTANT NOTES

Note: Torque Nuts to following values:

Nut	Torque
1/4-20 (7/16" Socket)	100 in-lbs
3/8-16 (9/16" Socket)	300 in-lbs

1. Do not lose hardware! Place hardware in a safe spot away from the machine ensuring that it does not fall loose into the machine tub. Hardware that is drawn

into the suction of the wash pump will damage the equipment. If you do need more hardware, contact your ECOLAB representative to purchase new items.
2. Read these Instructions thoroughly before attempting this maintenance evolution. Become familiar with the parts and what actions need to be taken. This will save time in the long run!

STEPS

1. Remove the Pawl Bar by pulling up on it..



Pawl Bar

2. Remove front drive motor cover. The front portion of the cover is fastened by 3 Philip screws.



5.0 SERVICE PROCEDURES

3. Remove the side drive motor cover. The side motor cover is fastened to the frame of the dishmachine by 3 7/16" nuts. (Socket extension may be necessary to reach nuts).



6. Remove greabox from H-Bracket using 9/16" socket (4 nuts)



4. Use Vice Grips to remove spring from leg castings.



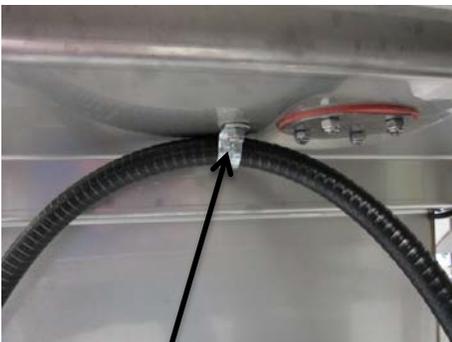
Spring

7. Move motor to other side of machine, passing it through the inside of the frame.



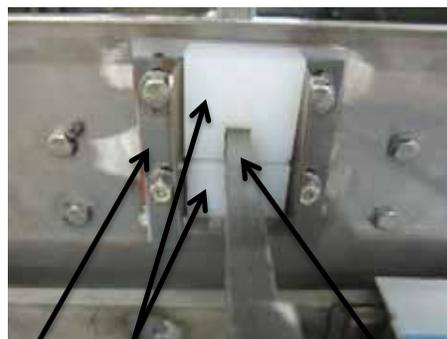
Keep Conduit on inside of frame

5. Loosen off the drive motor 1/2" conduit clamp from underneath drive end of tank using a 7/16" socket.



Conduit Clamp

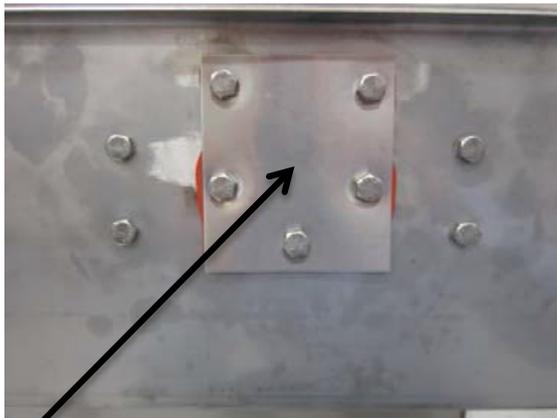
8. Remove Pawl Bar Gutter using 7/16" socket and Wrench (5 bolts). Remove Plastic blocks, rubber gasket, and drive linkage. Remove screw and spacer from arm which holds drive linkage in place before attempting to remove drive linkage.



Gutter Plastic Blocks Drive Linkage
(Rubber Gasket is behind Gutter)

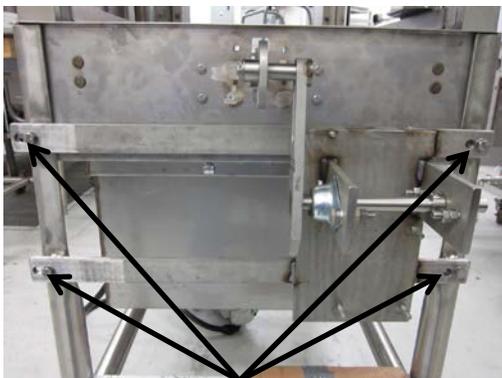
5.0 SERVICE PROCEDURES

9. On opposite side, remove Pawl bar gutter blank (5 bolts) and rubber gasket with same tools.



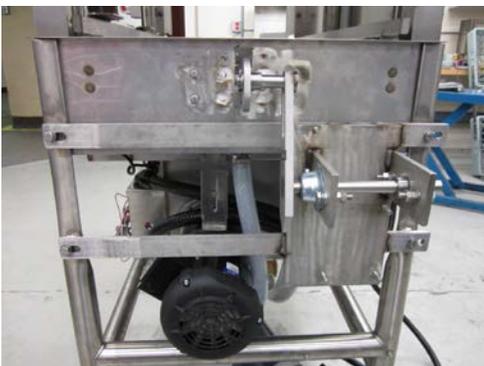
Blank (Gasket behind Blank)

10. Remove drive motor mounting bracket weldment with 9/16" socket (4 bolts)
WARNING: MOUNTING BRACKET IS HEAVY

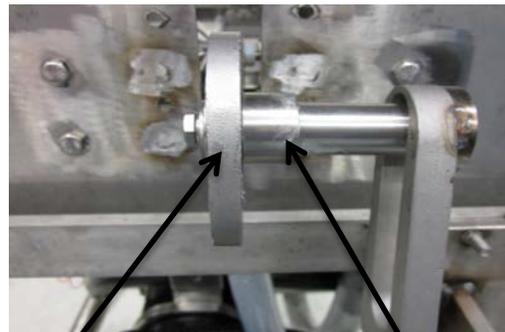


Remove 4 screws

11. Mount drive motor mounting bracket weldment to other side of machine.



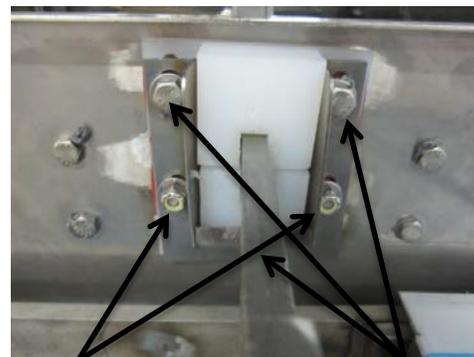
12. Shift spacer on drive socket to the right side of the drive linkage and tighten with 7/16" socket.



Drive Linkage

Spacer

13. Mount gasket, plastic blocks, and pawl bar gutter onto other side of machine. (5 bolts)
Note: 2 of the 5 bolts are longer (5/8" vs. 1/2"). These bolts go in with the nut on the outside of the machine to make room for rear pawl bar bracket roller.



5/8"

1/2"

14. Mount gasket and pawl bar gutter blank to other side of machine. Note: Longer bolts still go in same holes as other side.

15. Attach drive motor to mounting bracket.

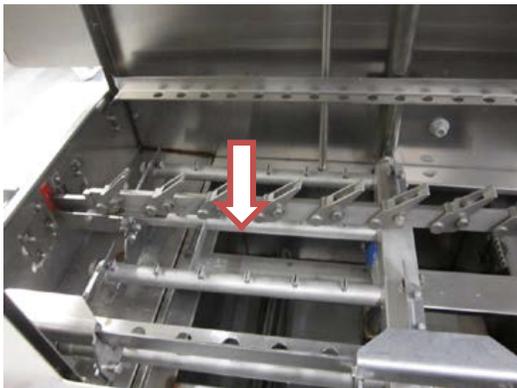


5.0 SERVICE PROCEDURES

- 16. Check motion/travel of Pawl bar and Drive Linkage. Adjust if motion is not smooth.
- 17. Reattach spring to cast legs using Vice Grips.



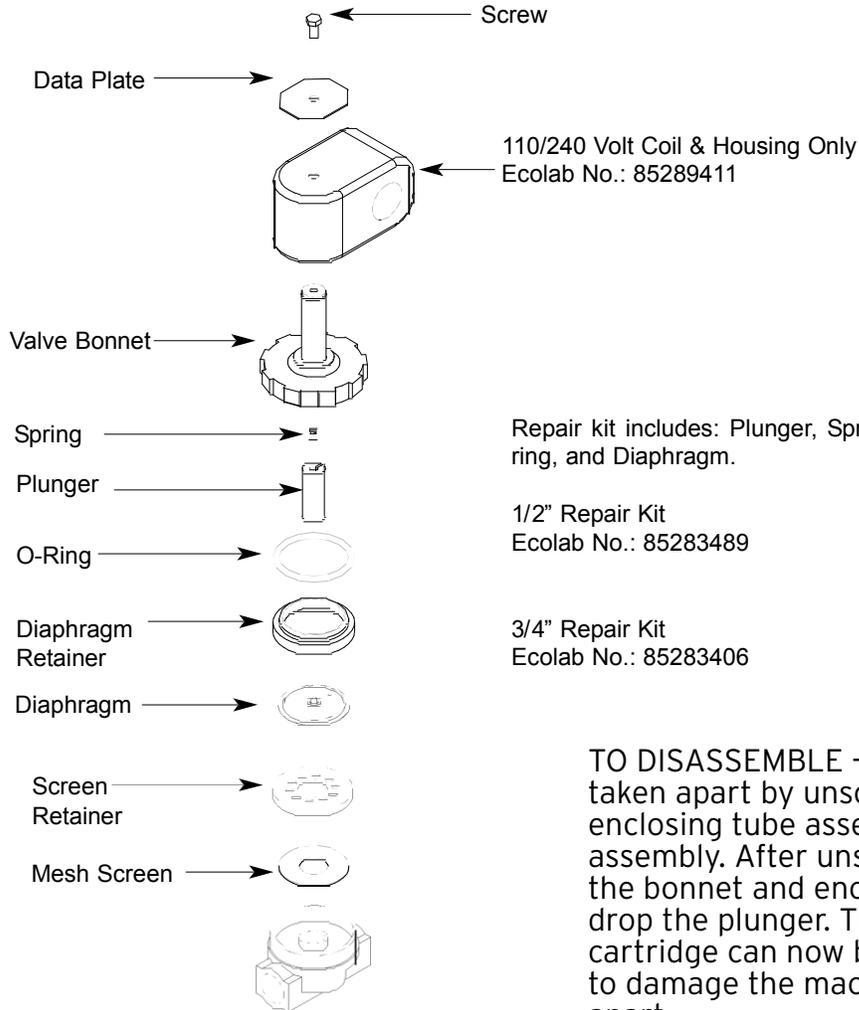
- 18. Reattach pawl bar to drive linkage and place on pawl bar bracket rollers. Pawl bar gutter may need some minor adjusting. When correct position is found tighten all all bolts on gutter and drive linkage. Note: If pawl bar is pushing strongly against pawl bar bracket, adjust drive motor bracket with washers to alleviate error.



- 19. Reattach left drive motor cover.
- 20. Reattach front drive motor cover.

6.0 PARTS SECTION

SOLENOID VALVE



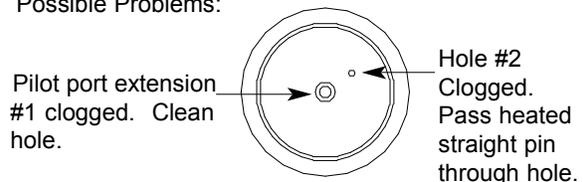
1/2" 110/240 Volt Solenoid Valve
Complete Assembly
Ecolab No.: 96580683

3/4" 110/240 Volt Solenoid Valve
Complete Assembly
Ecolab No.: 85260511

TO DISASSEMBLE - These valves may be taken apart by unscrewing the bonnet and the enclosing tube assembly from the valve body assembly. After unscrewing, carefully lift off the bonnet and enclosing tube assembly. Don't drop the plunger. The o-ring seal and diaphragm cartridge can now be lifted out. Be careful not to damage the machined faces while the valve is apart.

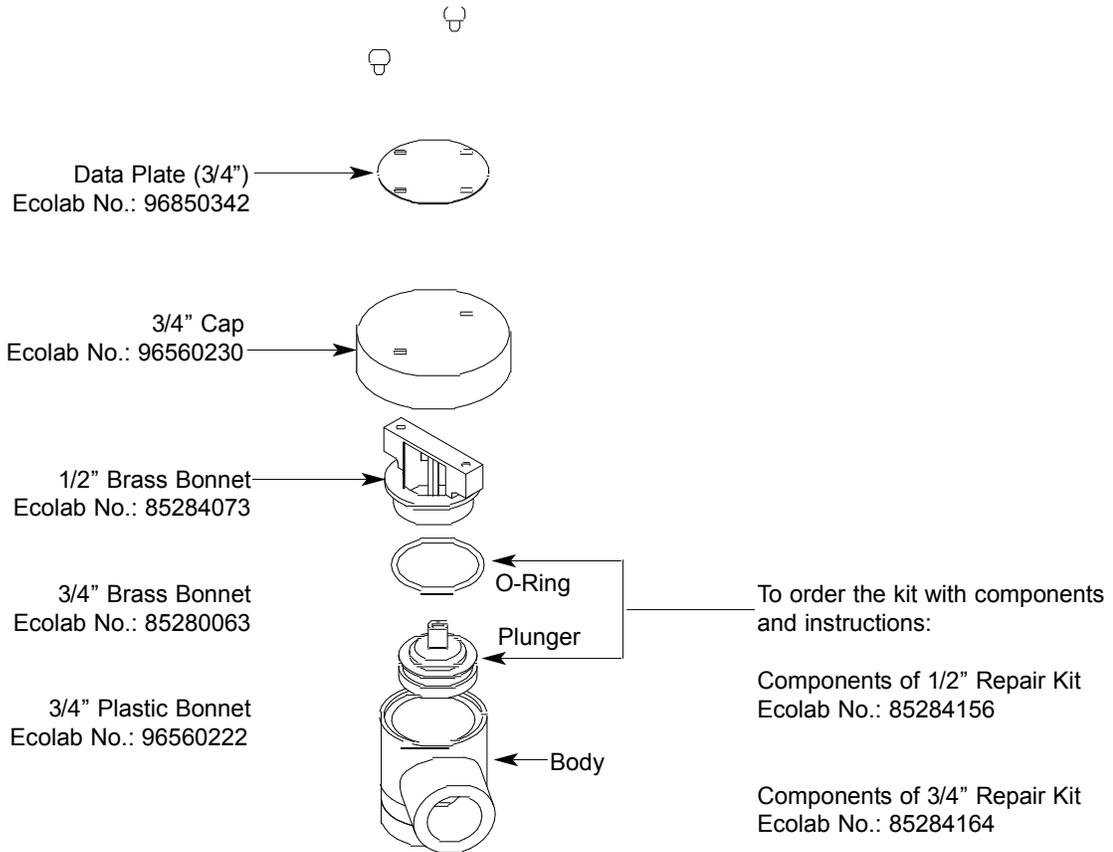
TO REASSEMBLE - Place the diaphragm cartridge in the body with the pilot port extension UP. Hold the plunger with the synthetic seat against the pilot port. Make sure the o-ring is in place, and then lower the bonnet and enclosing tube assembly over the plunger. Screw the bonnet assembly snugly down on the body assembly.

Possible Problems:



6.0 PARTS SECTION

VACUUM BREAKER REPAIR PARTS KITS



1/2" Complete Vacuum Breaker Assembly
 Ecolab No.: 85242543

3/4" Complete Vacuum Breaker Assembly
 Ecolab No.: 85242626

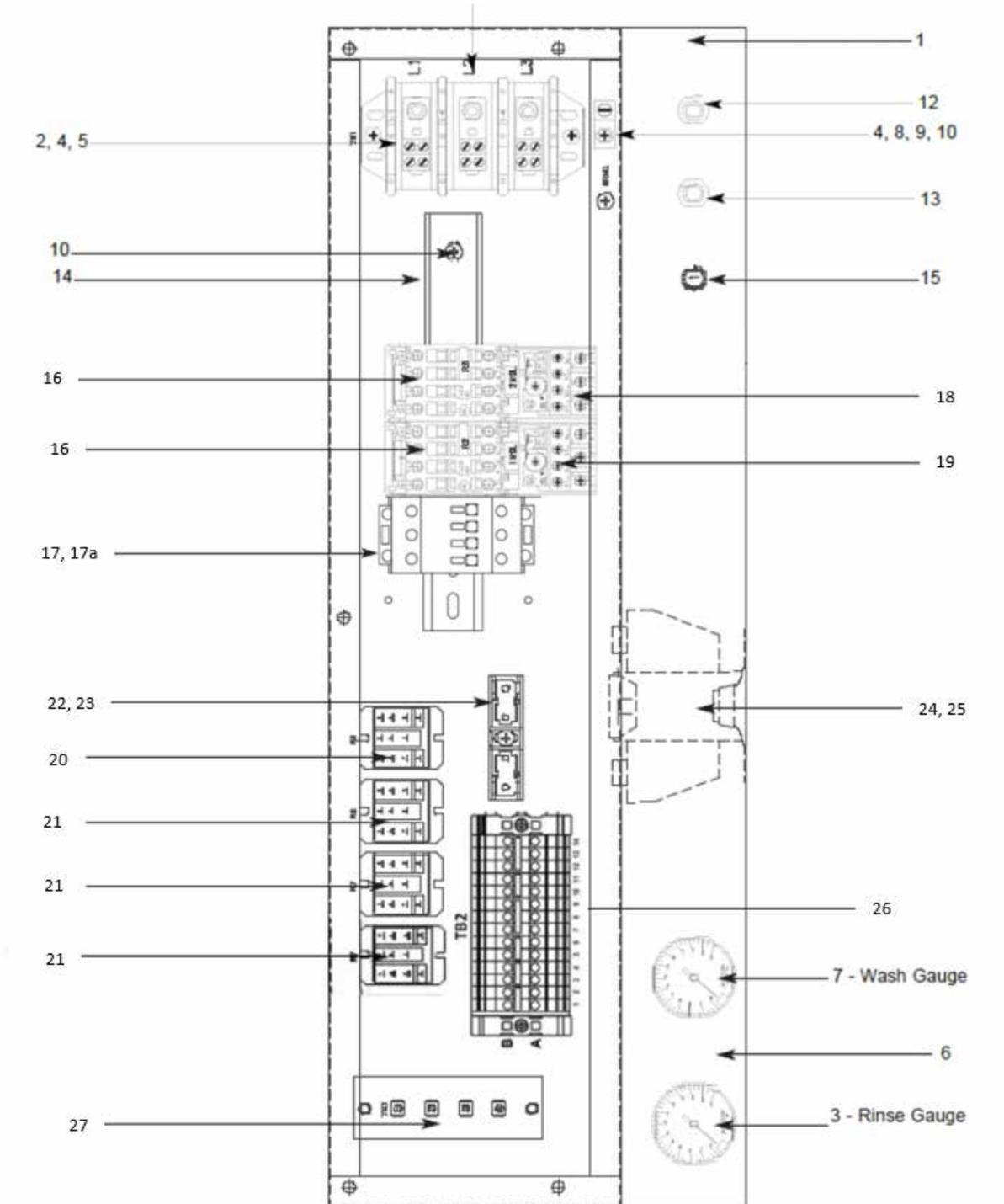
1/4" Complete Vacuum Breaker Assembly
 Ecolab No.: 85242501

1/4" Complete Vacuum Breaker Assembly
 Bottom Inlet & Outlet
 Ecolab No.: 85242000

3/8" Complete Vacuum Breaker Assembly
 Ecolab No.: 85242527

6.0 PARTS SECTION

EC44-LW/EC44HH-LW MODELS CONTROL BOX ASSEMBLY



6.0 PARTS SECTION

EC44-LW/EC44HH-LW MODELS CONTROL BOX ASSEMBLY

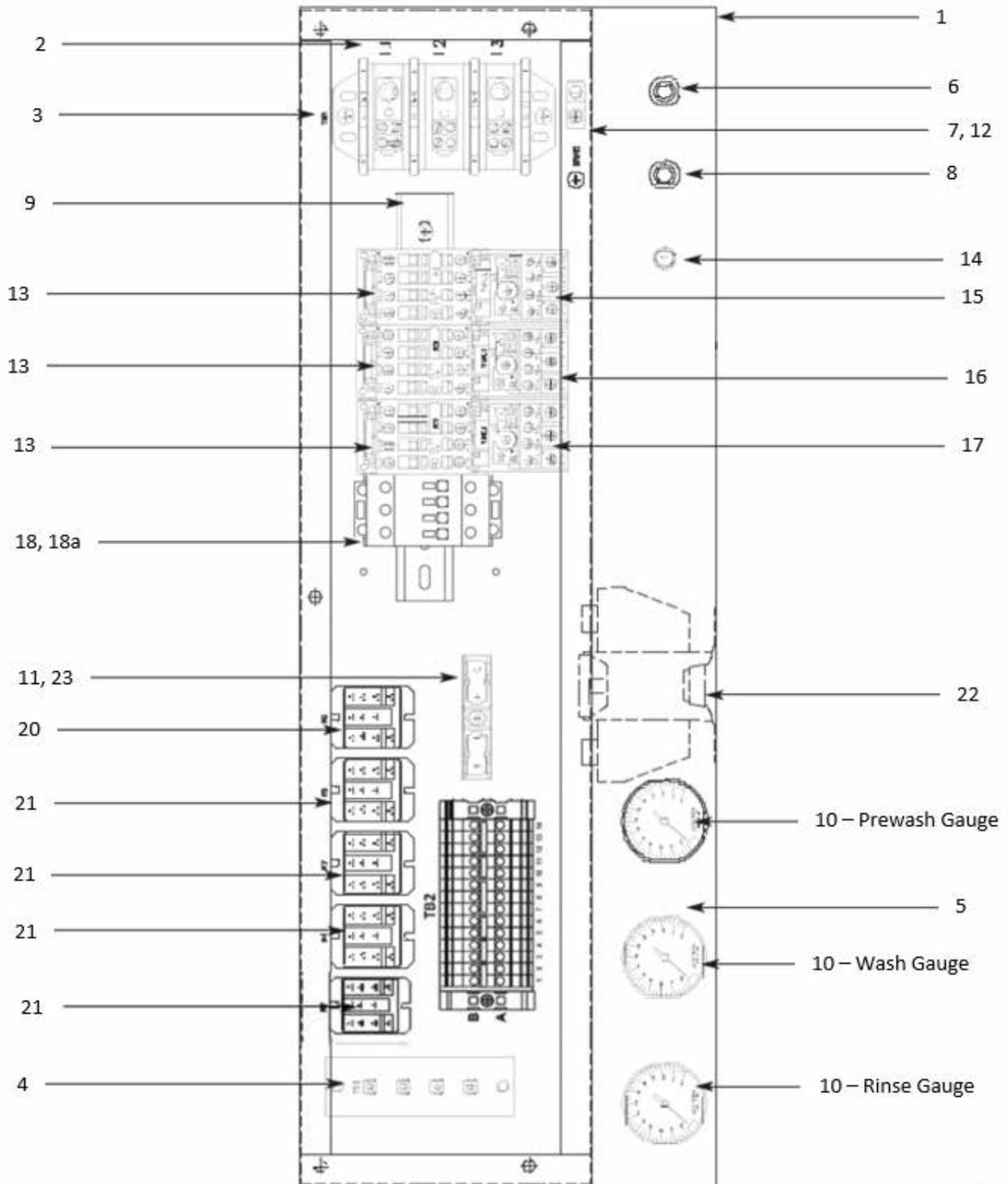
ITEM	QTY	DESCRIPTION	ECOLAB NO.
1	1	Electrical Box Weldment	96522134
2	1	Terminal Block, 3 Pole	96021233
3	1	Thermometer, Rinse	96021316
		Decal, Rinse 180°F (Hot Water Sanitizing)	96582237
		Decal, Rinse 120°F (Chemical Sanitizing)	96022061
4	4	Star Washer, External Tooth, 10-24	96026976
5	6	Screw, 10-32 x 3/4" Long Phillips Trusshead	88120217
6	1	Decal, Gauge, EC44-LW 208/230V	53001291
		Decal, Gauge, EC44-LW 460V	53001292
7	1	Thermometer, Wash	96022104
		Decal, Wash 160°F (Hot Water Sanitizing)	96582238
		Decal, Wash 140°F (Chemical Sanitizing)	96582240
8	1	Ground Lug, 2 AWG to 14 AWG	83118000
9	1	Decal, Ground	96028245
10	1	Screw, 10-32 x 1/2" Long Phillips Trusshead	96022124
11	1	Decal, L1-L2-L3	96021357
12	1	Light, Amber	96583703
13	1	Light, Red	96583943
14	1	Din Rail, 8.5"	53001815
15	1	Circuit Breaker (208/230V models only)	96021290
16	2	Motor Contactor	96021209
17	1	Heater Contactor (3-Phase, 3-Pole Terminals for 8 GA Wires)	50000533
17a	1	Heater Contactor (1-Phase, 4-Pole Terminals for 8 GA Wires)	50000534
18	1	Overload	See Page 72
19	1	Overload	See Page 72
20	1	Relay, 2-Pole (Used for R8)	96582895
21	3	Relay, 3-Pole (Used for R4, R6, R7)	96021159
22	1	Fuse (460V models only)	96022835
23	1	Fuse holder for (22) above	96022843
24	1	Transformer (208/230/460V)	50000447
25	4	Locknut, 10-24 with Nylon insert	88429063
26	1	Terminal Board TB2	See Page 71
27	1	Terminal Board TB3	83105008
28	1	Screw, 10-32 x 3/8" Long Phillips Trusshead	88120878

MISCELLANEOUS PARTS NOT SHOWN:

Grommet, 1/2" OD x 3/8" ID	96030341
Bushing, Heyco SB100	96031745
Plug, Heyco 2700 G-875	96024567
Control Box Cover	96529051
Control Box Cover Hinge Weldment	
MANUAL/DELIME Switch (located on read of control box)	96582030
MANUAL/DELIME Switch Decal (located on read of control box)	96038559
Copper Conductors Only Decal	96021365
Control Box Leg	96021381
Bolt, 1/4-20 x 2-1/2" Long Hex Head	88000104
Locknut, 1/4-20 with Nylon Insert	88429113
Component Mounting Plate (located inside control box)	96021100
Heater Contractor Din Rail Plate	96029475

6.0 PARTS SECTION

EC66-LW/EC66HH-LW MODELS CONTROL BOX ASSEMBLY



6.0 PARTS SECTION

EC66-LW/EC66HH-LW MODELS CONTROL BOX ASSEMBLY

ITEM	QTY	DESCRIPTION	ECOLAB NO.
1	1	Electrical Box Weldment	96522134
2	1	Decal, L1-L2-L3	96021357
3	1	Terminal Block, 3 Pole	96021233
4	1	Terminal Board TB3	83105008
5	1	Decal, Gauge, EC66-LW 208/230V	53001293
		Decal, Gauge, EC66-LW 460V	53001294
6	1	Light, Amber	96583703
7	1	Ground Lug, 2 AWG to 14 AWG	83118000
8	1	Light, Red	96583943
9	1	Din Rail, 8.5"	53001815
10a	1	Thermometer, 96" Lead, Rinse	96021316
10b	1	Thermometer, 96" Lead, Wash and Prewash	96022104
		Decal, Rinse 180°F (Hot Water Sanitizing)	96582237
		Decal, Wash 160°F (Hot Water Sanitizing)	96582238
		Decal, Rinse 120°F (Chemical Sanitizing)	96022061
		Decal, Wash 140°F (Chemical Sanitizing)	96582240
11	1	Fuse (460V models only)	96022835
12	1	Decal, Ground	96028245
13	3	Motor Contactor	96021209
14	1	Circuit Breaker (208/230V models only)	96021290
15	1	Overload	See Page 72
16	1	Overload	See Page 72
17	1	Overload	See Page 72
18	1	Heater Contactor (3-Phase, 3-Pole Terminals for 8 GA Wires)	50000533
18a	1	Heater Contactor (1-Phase, 4-Pole Terminals for 8 GA Wires)	50000534
20	1	Relay, 2-Pole (Used for R8)	96582895
21	4	Relay, 3-Pole (Used for R4, R6, R7, R9)	96021159
22	1	Transformer (208/230/460V)	50000447
23	1	Fuse holder for (11) above	96022843

MISCELLANEOUS PARTS NOT SHOWN:

Control Box Cover	96529051
Control Box Cover Hinge Weldment	
MANUAL/DELIME Switch (located on read of control box)	96582030
MANUAL/DELIME Switch Decal (located on read of control box)	96038559
Copper Conductors Only Decal	96021365
Control Box Leg	96021381

Note: Refer to machine electrical schematic for proper positioning of red jumpers.



Ecolab #	Description
83103014	Block, Terminal (QTY=14)
83103015	End Cover, Terminal Block (QTY=2)
83103016	End Block, Terminal Block (QTY=2)
83103037	Jumper, Terminal Block, 2 Pin
83103038	Jumper, Terminal Block, 3 Pin

6.0 PARTS SECTION

MOTOR OVERLOADS CHART

DRIVE MOTORS:

MODEL(S)	VOLTS	PHASE	ECOLAB NO.
EC-44(HH)	208	1	N/A
	230	1	N/A
	208	3	96021217
	230	3	96021217
	460	3	96022885
EC-66(HH)	208	1	N/A
	230	1	N/A
	208	3	96021217
	230	3	96021217
	460	3	96022885

PREWASH MOTORS:

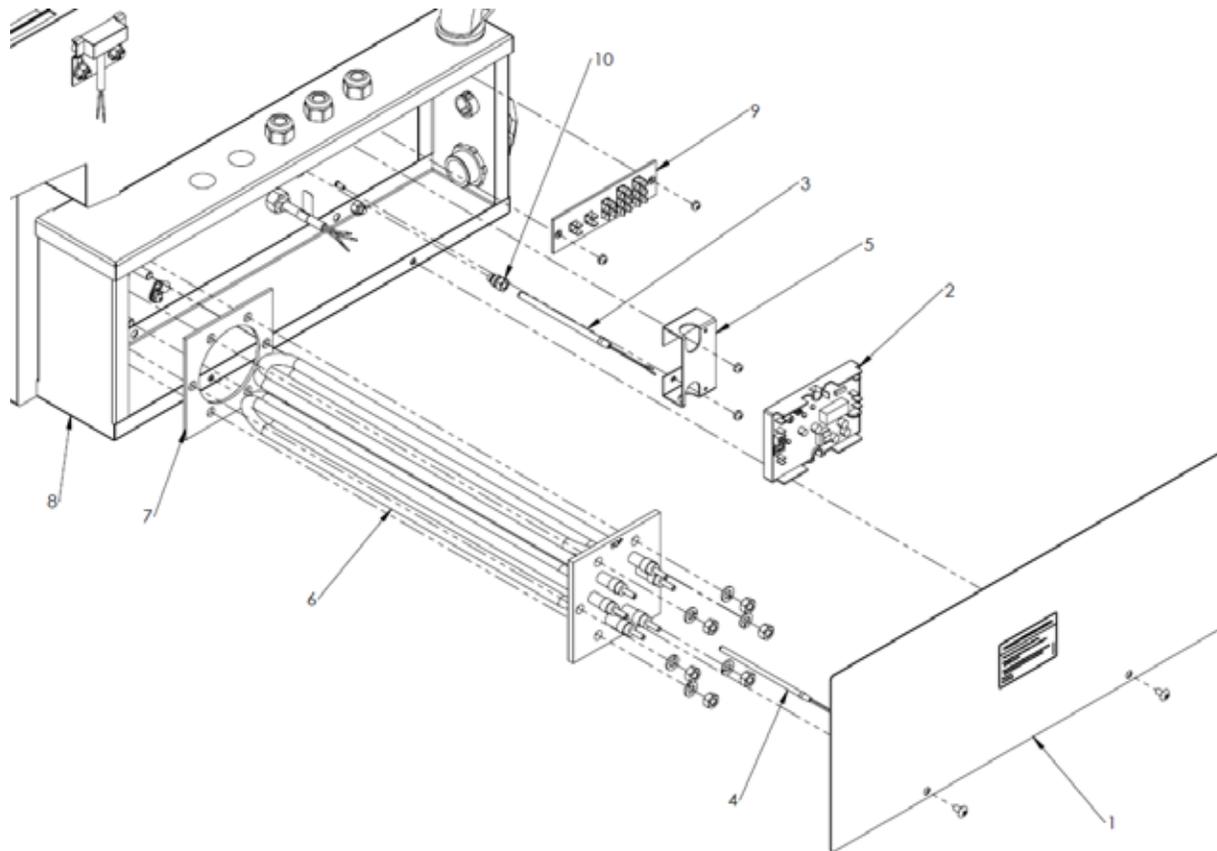
MODEL(S)	VOLTS	PHASE	ECOLAB NO.
EC-44(HH)	208	1	N/A
	230	1	N/A
	208	3	N/A
	230	3	N/A
	460	3	N/A
EC-66(HH)	208	1	N/A
	230	1	N/A
	208	3	96022884
	230	3	96022884
	460	3	96022886

WASH MOTORS:

MODEL(S)	VOLTS	PHASE	ECOLAB NO.
EC-44(HH)	208	1	N/A
	230	1	N/A
	208	3	96021225
	230	3	96021225
	460	3	96022884
EC-66(HH)	208	1	N/A N/A
	230	1	N/A N/A
	208	3	96021225
	230	3	96021225
	460	3	96022884

6.0 PARTS SECTION

HEATER BOX ASSEMBLY

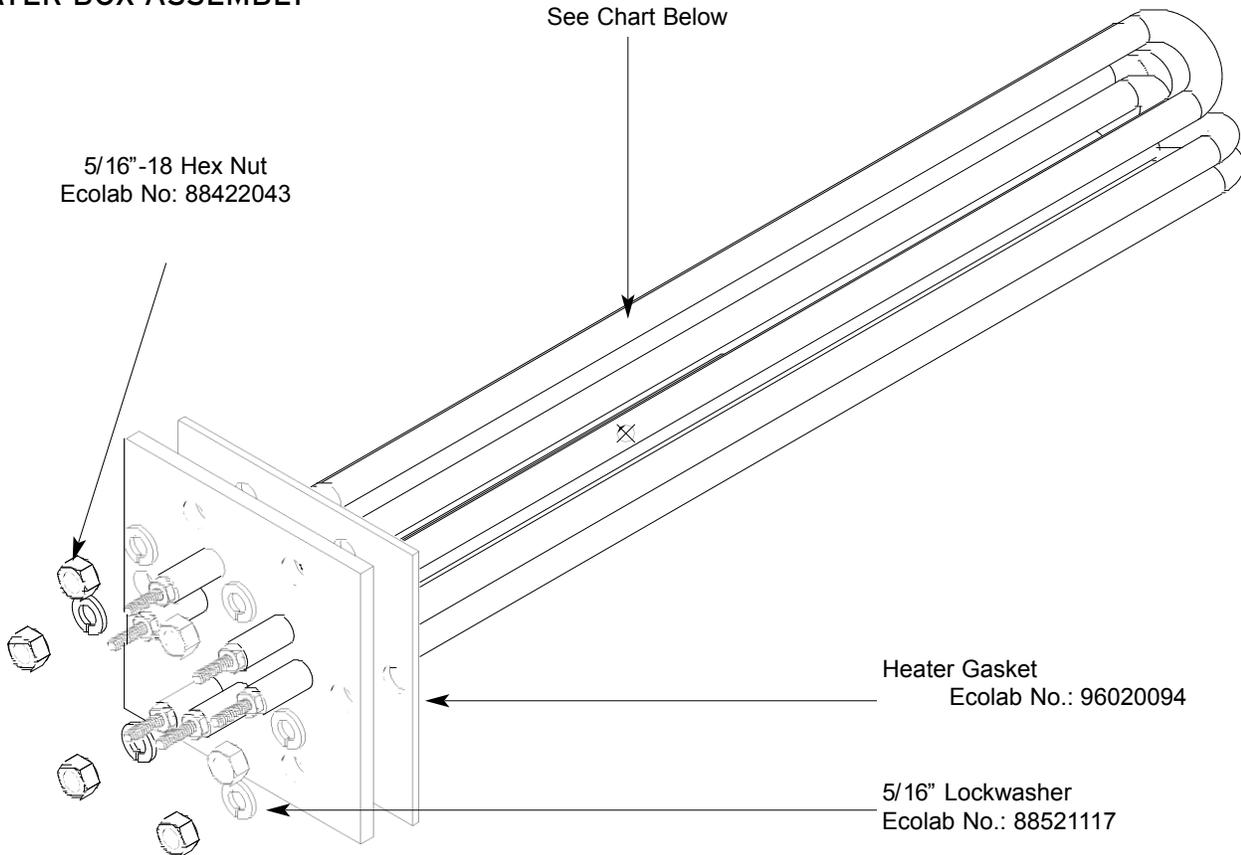


ITEM	QTY	DESCRIPTION
1	1	Heater Box Cover
2	1	Elan Single Temperature Controller
3	1	Regulating Thermistor
4	1	High Limit Thermistor
5	1	Temp Controller Mounting Bracket
6	1	Wash Heater
7	1	Gasket
8	1	Heater Box Weldment
9	1	Terminal Board
10	1	Fitting, 1/4", Imperial Brass

ECOLAB NO.
96522164
53001038
53001036
53001033
53001037
See Next Page
96020094
96522157
96021134
96024344

6.0 PARTS SECTION

HEATER BOX ASSEMBLY



MODEL	VOLTS	PHASE	KW	ECOLAB NO.	heater wiring kits
All	208	1	15	89001016	96522055 1 ph
All	230	1	15	89001017	96522056 3 ph
All	208	3	15	89001016	Note: Does not include the Contactor
All	230	3	15	89001017	
All	460	3	15	89001018	

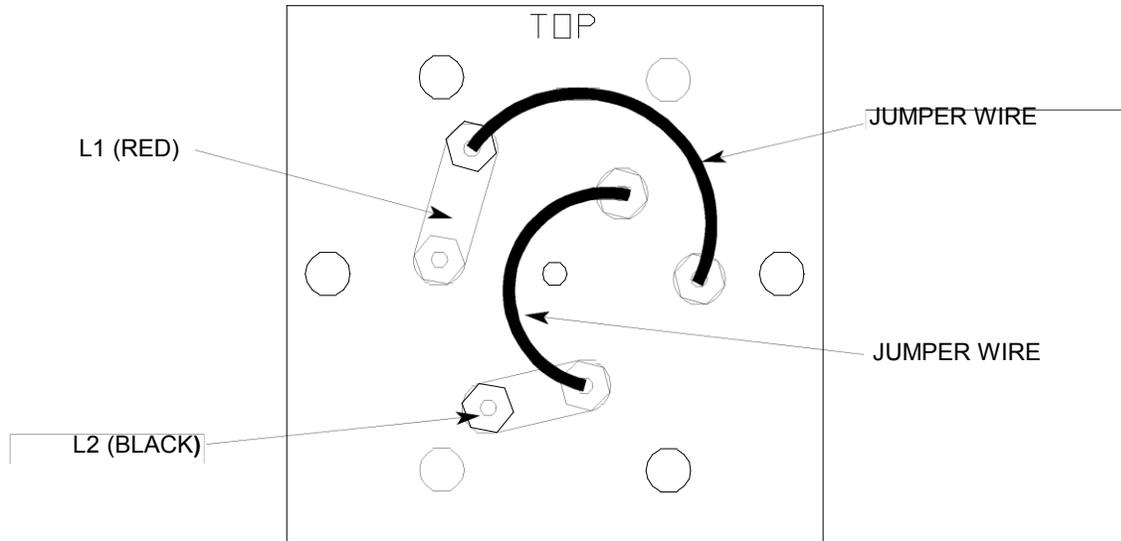
SERVICE NOTE: When replacing the tub heaters, it is HIGHLY recommended that you also change out the gasket as well. Once installed, gaskets become compressed and are subjected to extreme temperature changes. Replacing the gasket with a new one when replacing the heater may prevent future leaks.

SERVICE NOTE: The nuts used to secure the heater to the tub should be torqued to 16 in-lbs. After tightening, the unit should be allowed to heat up and operate normally for approximately 30 minutes. Secure power to the machine and check the nuts once more to ensure that they are torqued to 16 in-lbs.

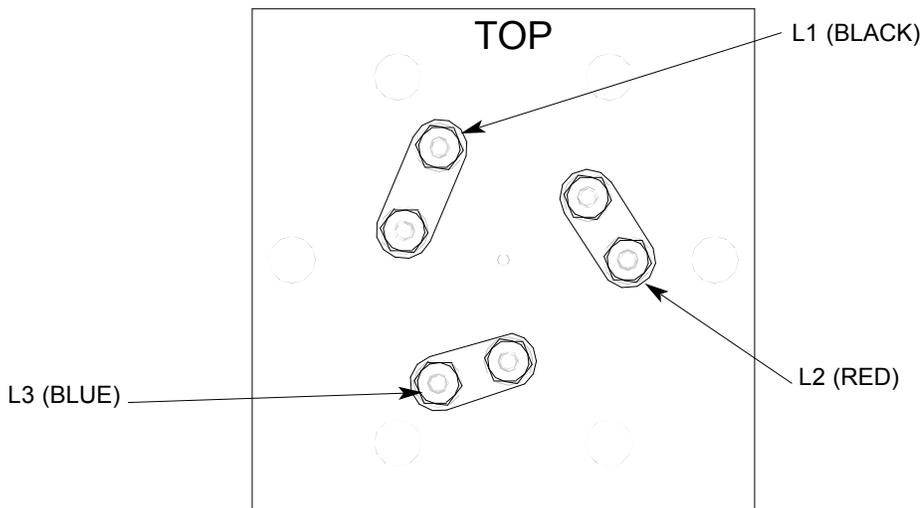
6.0 PARTS SECTION

HEATER BOX ASSEMBLY

BUS BAR, JUMPER WIRES AND LEAD LOCATIONS FOR WASH HEATER TO BE WIRED FOR 1 PHASE AC.



BUS BAR AND LEAD LOCATIONS FOR WASH HEATER TO BE WIRED FOR 3 PHASE AC.



6.0 PARTS SECTION

HEATER SYSTEM EXPLANATION

The wash tank heater system is electrically connected in the circuit so that they are dependent upon the dishmachine being properly filled with and maintaining a safe water level, a temperature controller (mounted in the heater box behind the dress panel), float switch (mounted in the wash tank), and the heater relay (mounted in control box) with the heater being activated by the temperature controller.

Once the dishwasher has been filled to the correct level, the heater should operate automatically. Should the tank heat be too high, too low or no indication of temperatures at all, the following checkout should be made.

Note: *The following checkout should be made by either a qualified service person or electrician.*

A. - Checkout of the heater system

1. - If the temperature is too high, adjust temperature controller using instructions on the page titled "Thermostats".
2. - If temperature is too low, adjust temperature controller as above, then:
 - a. - Turn off power to machine by placing customer's circuit breaker in the "OFF" position.
 - b. - Remove cover from control box on top of dishwasher.
 - c. - Make sure water temperature is below 140°F (preferably about 130°F).
 - d. - Turn on both circuit breakers. Observe heater relay (R1) while the power switch is turned "ON" and "OFF". If relay contacts move in and out, the heater relay is operating correctly; if not proceed to "C".

B. - If heater relay (R1) closes:

1. - Check power supply at incoming terminal board L1, L2 & L3. It should be the same voltage as indicated on the machine data plate.
2. - Check power at connections on heater relay (R1). The voltage should agree with the voltage on the machine data plate. If not, check wires for breaks or bad connections.
3. - Check power at terminals of heater which should agree with the data plate. If not check wires for breaks or bad connections.
4. - Temperatures should rise as explained in "C-1", and amperage may be checked according to those instructions. Replace any defective elements.

C. - If heater relay (R1) does not close.

1. - There is an insulated movable bar on relay across the top. With an insulated probe, depress this bar and observe the thermometer: the temperature should rise noticeably in a minute or two. If it moves slowly, it would indicate that the element is faulty. If it moves constantly higher at a good rate, elements should be good.

Note: *A check with an amp probe at heater relay (R1) terminals should be made to verify the amp draw on each leg. This should be appropriate for the voltage and phase indicated on the data plate.*

HEATER PROTECTION & AUTOMATIC FILL/ THERMOSTATS

HEATER PROTECTION & AUTOMATIC FILL:

This control is activated when the power switch is turned "ON". The primary function is to automatically energize the wash tank heat circuit. It will also cutoff the wash tank heat circuit should the water be accidentally drained from the machine with the power switch still "ON". The power switch should always be turned-off before draining the unit.

This water level control consists of two (2) floats that operate when the power switch is turned on and works in conjunction with the thermostats and heater relays.

When the power switch is turned "ON" water starts to enter the dishmachine. When it reaches the proper level the normally open contacts in the water level float switch close activating the heating circuit for tank heat.

If the water level falls below the correct level while power is still on, the float switch will sense the lack of water and de-activate the heater.

Temperature Controller:

This unit uses an electronic temperature controller with probe type thermistors to monitor and regulate wash tank temperature. Machine temp is set from the factory to 170-175F, and the controller is field adjustable from 110F to 200F.

The temperature controller also includes a built in Hi-Limit thermostat for the wash tank heater.

Calibration:

Wash Thermostat: Set Point: 175°F (Adjustable range)

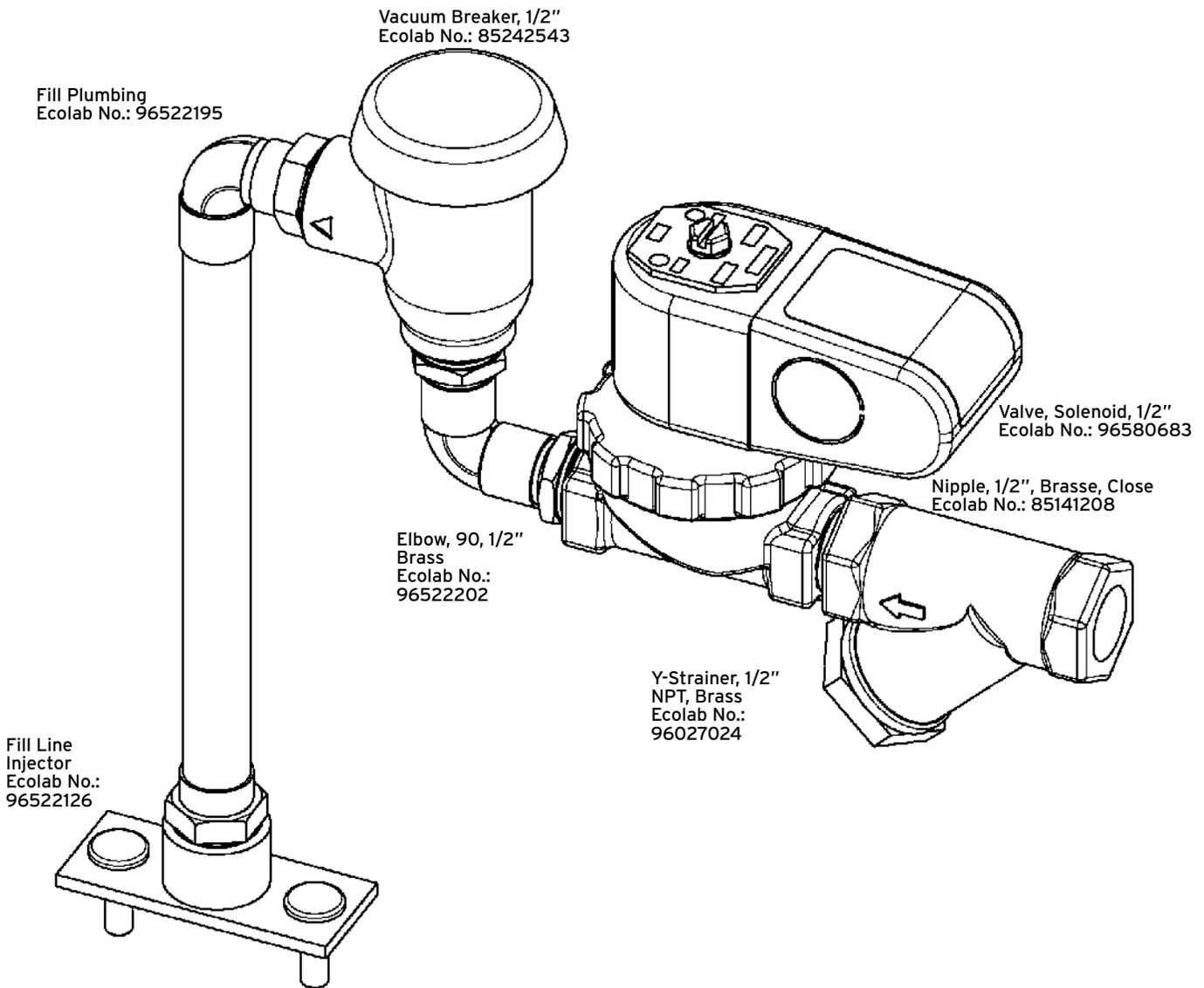
Hi-Limit Thermostat: Fixed set point: 207°F (Non-adjustable)

The hi-limit is used to protect the heater element in the event of a runaway regulating thermostat or a dry fire situation. It is set for 207°F +2°F or -2°F with a fixed set point. This part is not adjustable.

The wash tank regulating thermostat will maintain the correct wash water temperature to meet NSF requirements. These specify that the wash be no lower than 140°F on chemical sanitizing models and no lower than 160°F on hot water sanitizing machines.

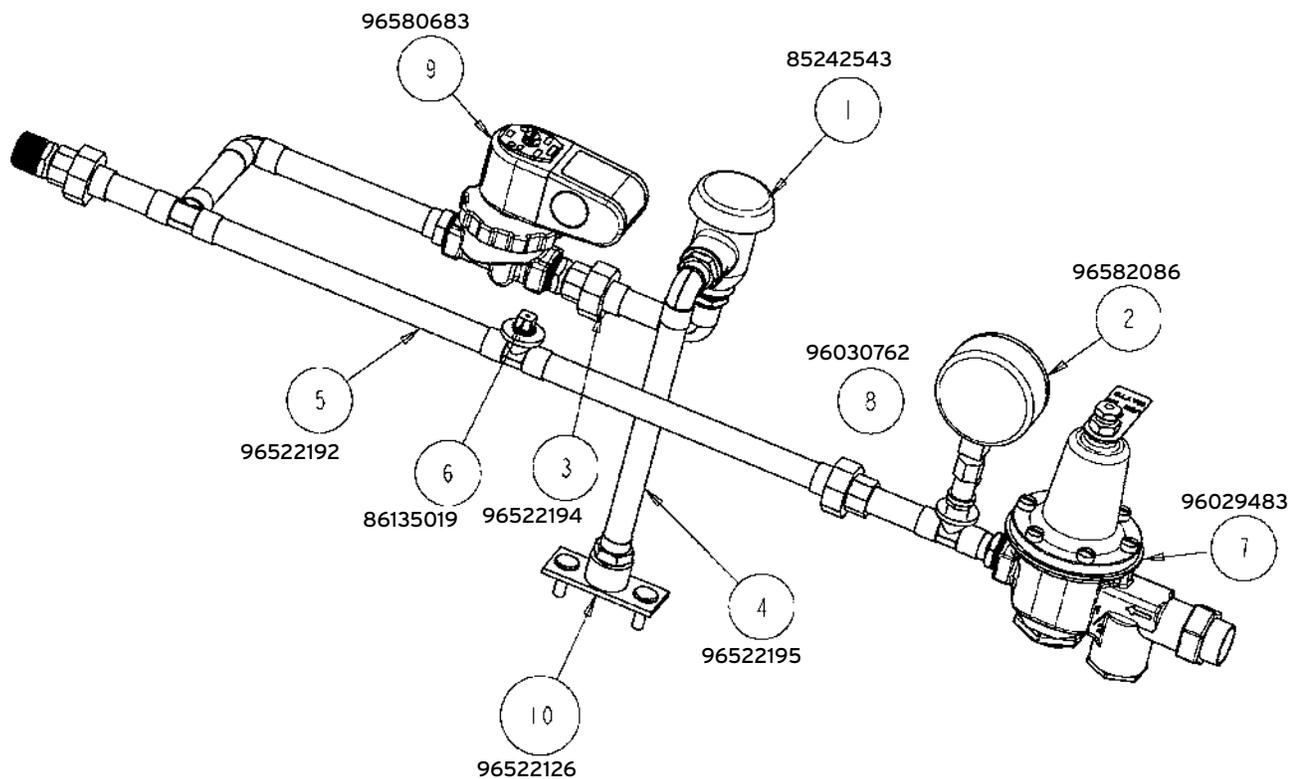
6.0 PARTS SECTION

PREWASH SECTION INCOMING PLUMBING ASSEMBLY (66" Machines Only)



6.0 PARTS SECTION

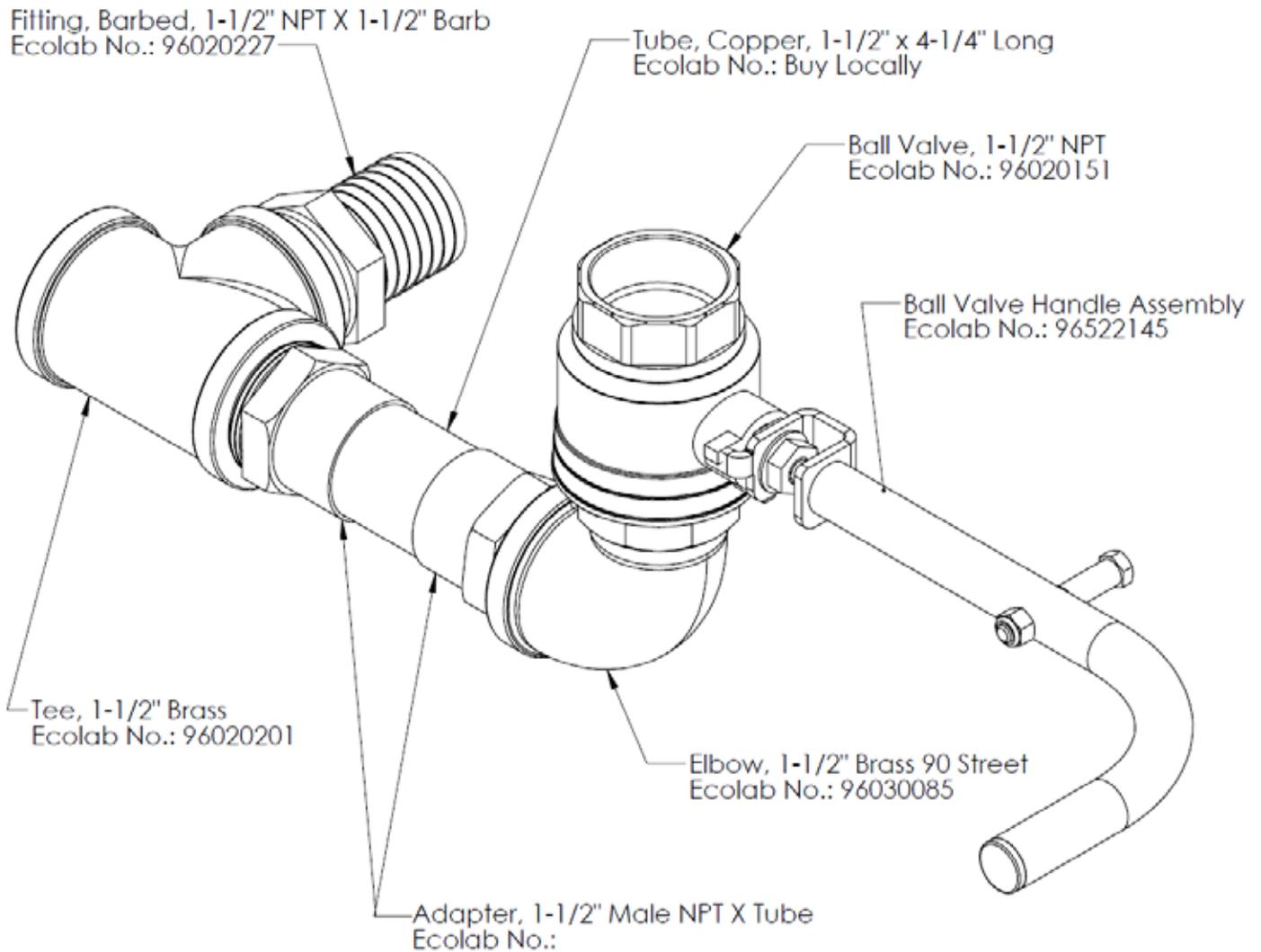
WASH SECTION INCOMING PLUMBING ASSEMBLY



ITEM	QTY	DESCRIPTION	ECOLAB NO.
1	1	Vacuum Breaker, 1/2" NPT	85242543
2	1	Gauge, Pressure, Water	96582086
3	1	Piping Assembly, Breaker to Valve	96522194
4	1	Piping Assembly, Fill to Chamber	96522126
5	1	Main Piping Assembly, Solenoid to PRV	96522192
6	1	Plug, Bras, 1/4" NPT	86135019
7	1	Pressure Regulator	96029483
8	1	Test Cock Ball Valve	96030762
9	1	Solenoid Valve, 1/2"	96580683
10	1	Injector, Fill Line	96522126

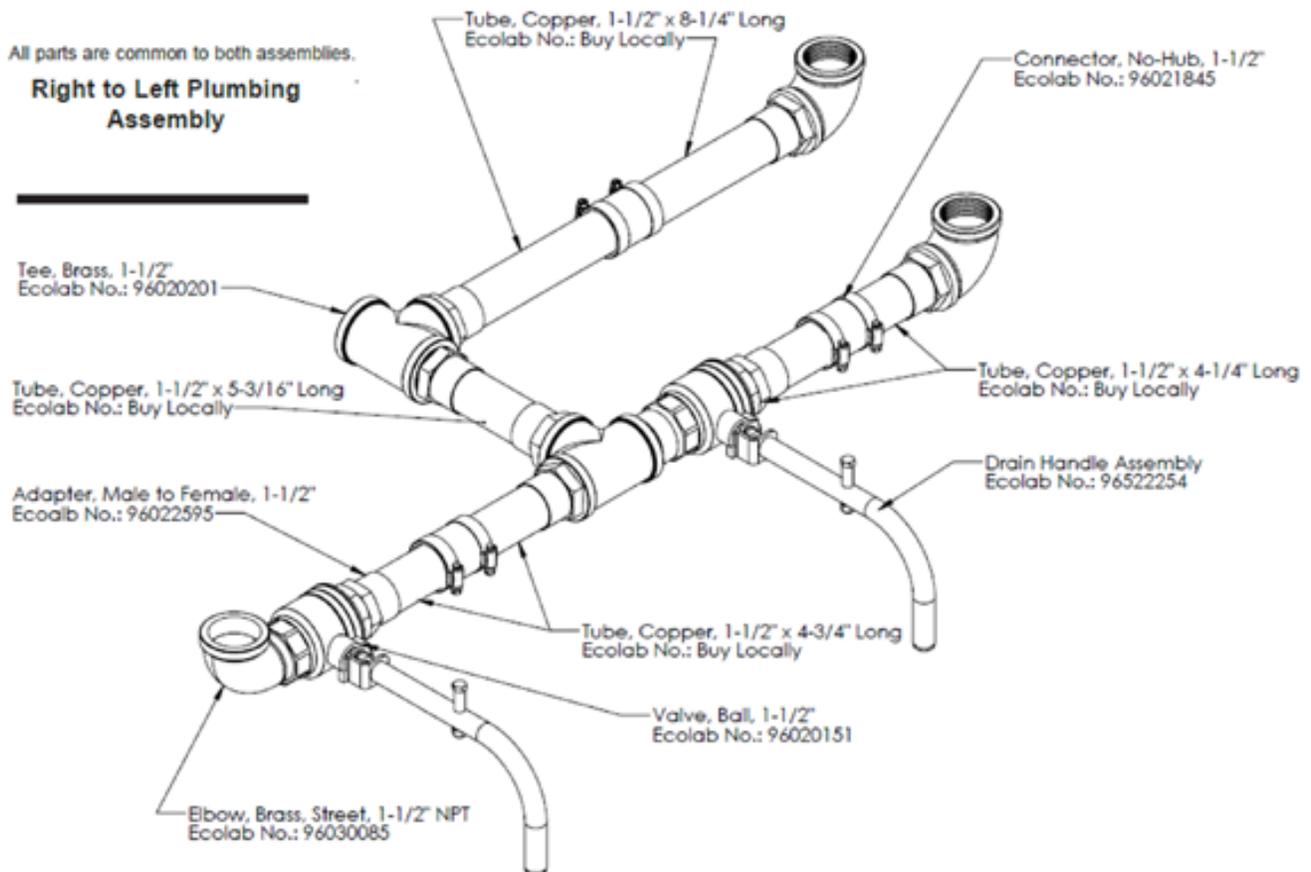
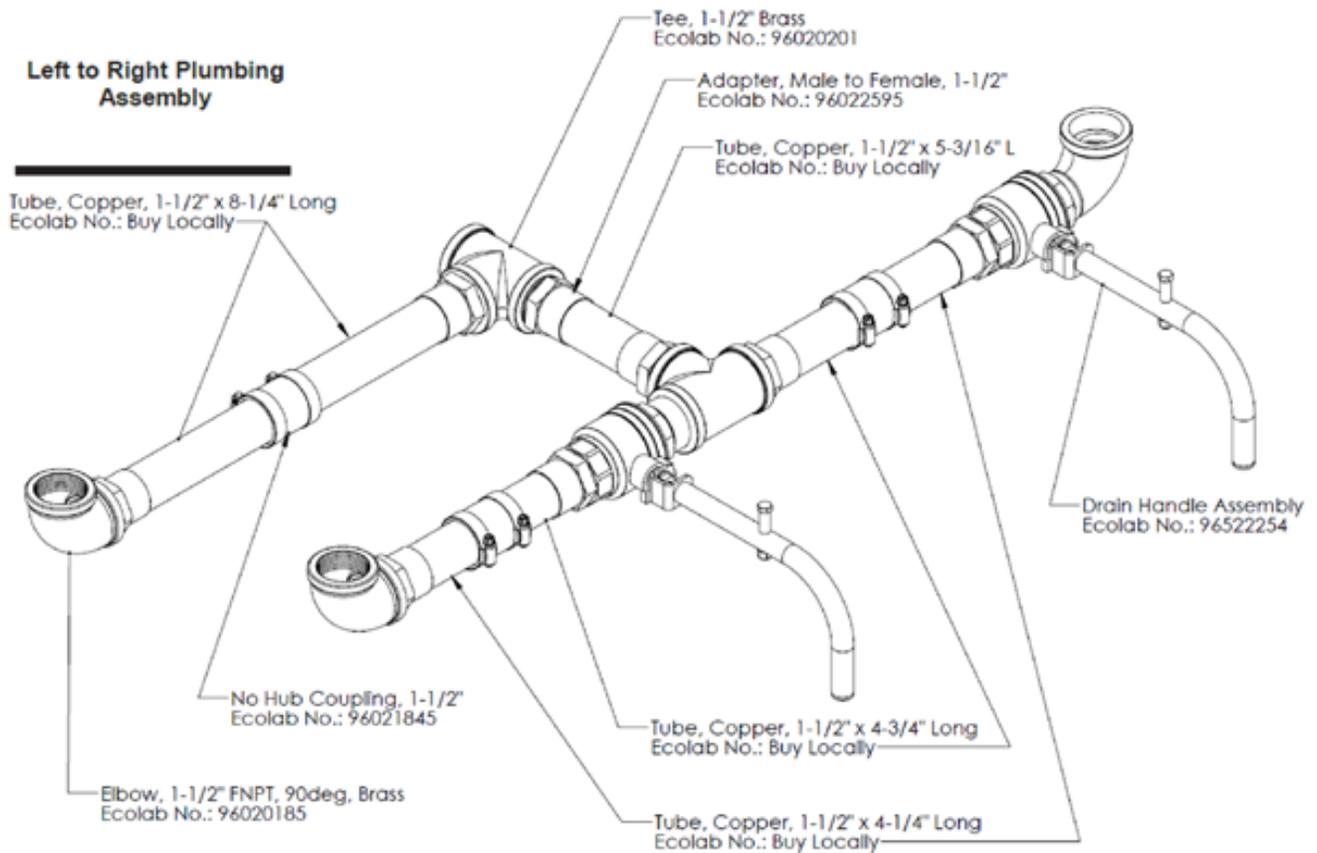
6.0 PARTS SECTION

EC44-LW/EC44HH-LW MODELS DRAIN PLUMBING ASSEMBLY



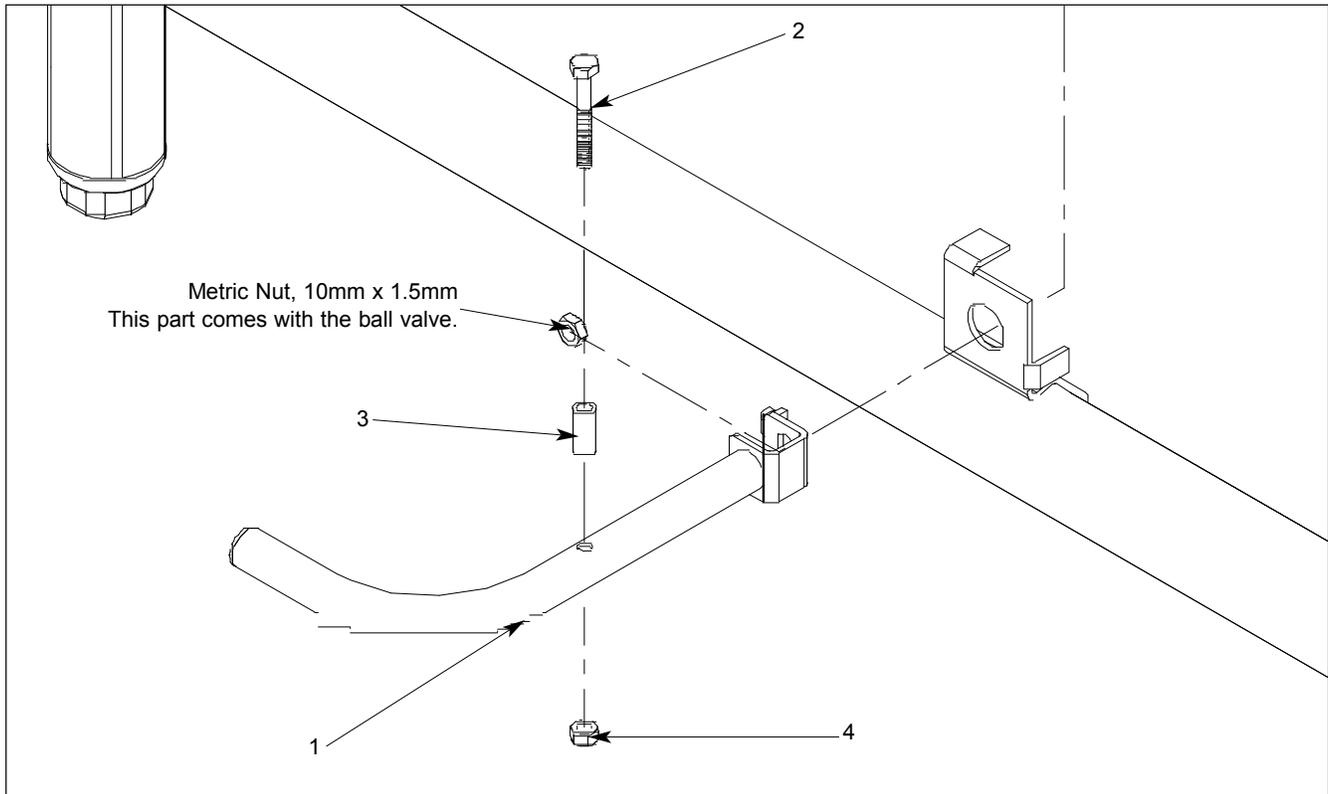
6.0 PARTS SECTION

EC66-LW/EC66HH-LW DRAIN PLUMBING ASSEMBLIES

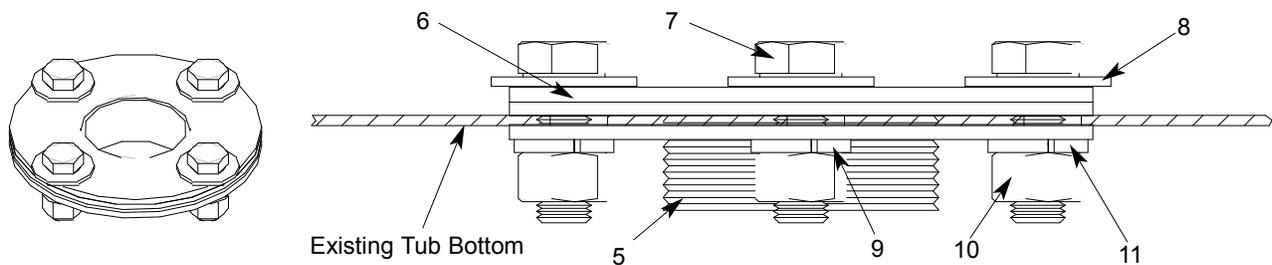


6.0 PARTS SECTION

DRAIN HANDLE ASSEMBLY/TUB DRAIN REPLACEMENT

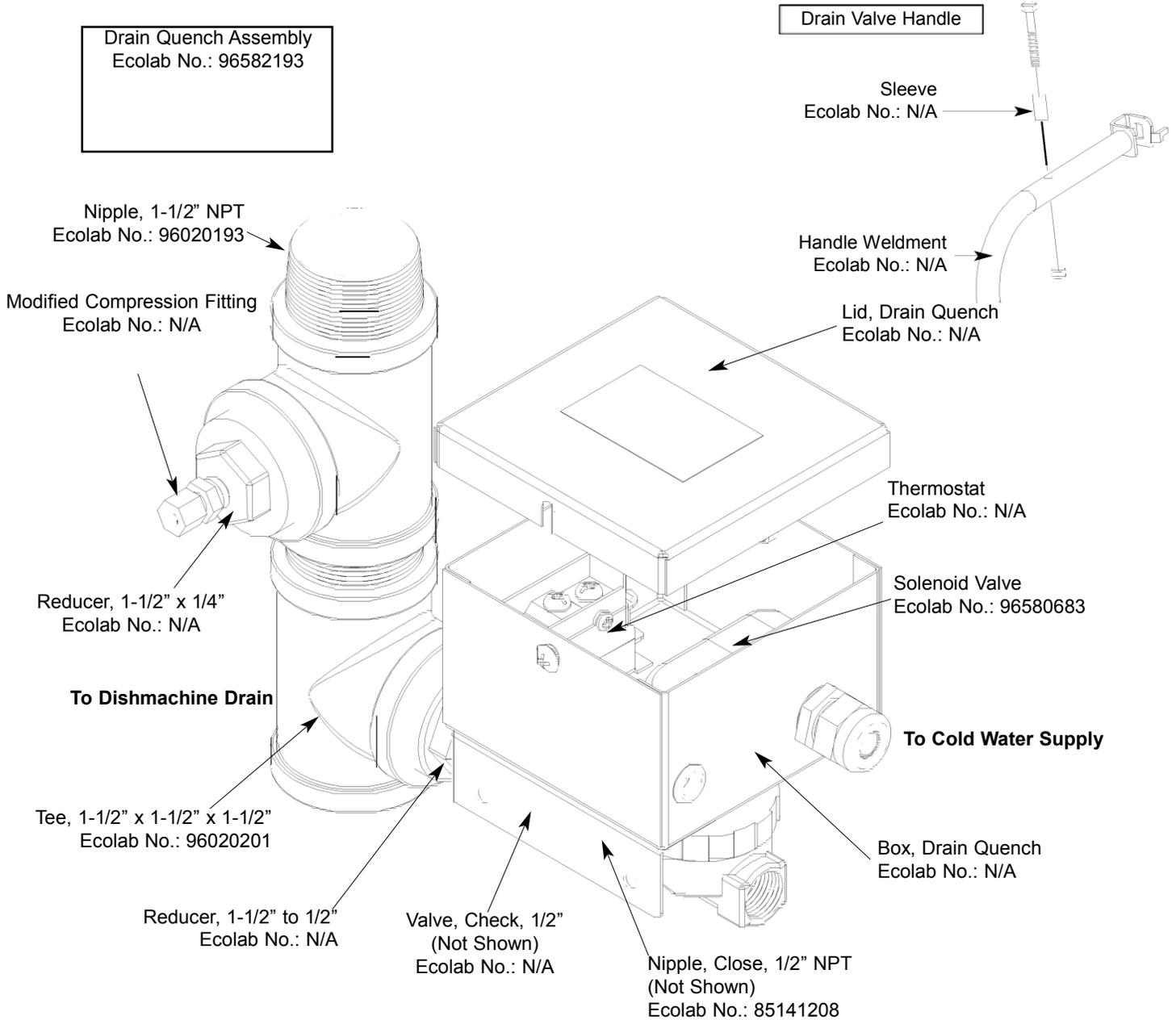


ITEM	QTY	DESCRIPTION	ECOLAB NO.
1	1	Ball Valve Handle Weldment EC44	96020177
		EC66	96022603
2	1	Bolt, 1/4"-20 x 2" Long	96026398
3	1	Sleeve	96026406
4	1	Locknut, 1/4"-20 with Nylon Insert	88429113
*	1	Drain Repair Kit (Shown Below)	96031448
5	1	Weldment, Tub Drain Replacement Plate	N/A
6	1	Gasket, Tub Drain Replacement Plate	96038609
7	1	Bolt, Hex Head, 3/8"-16 x 1" Long	96034053
8	1	Flat Washer, 3/8"	88530605
9	1	Split Lock Washer 3/8"	88521109
10	1	Hex Nut, 3/8"-16	88422068
11	1	Tub Drain Plate A	N/A
12*	1	6 Hole Drain Weldment	96522094
13*	1	6 Hole Drain Gasket	96522095



6.0 PARTS SECTION

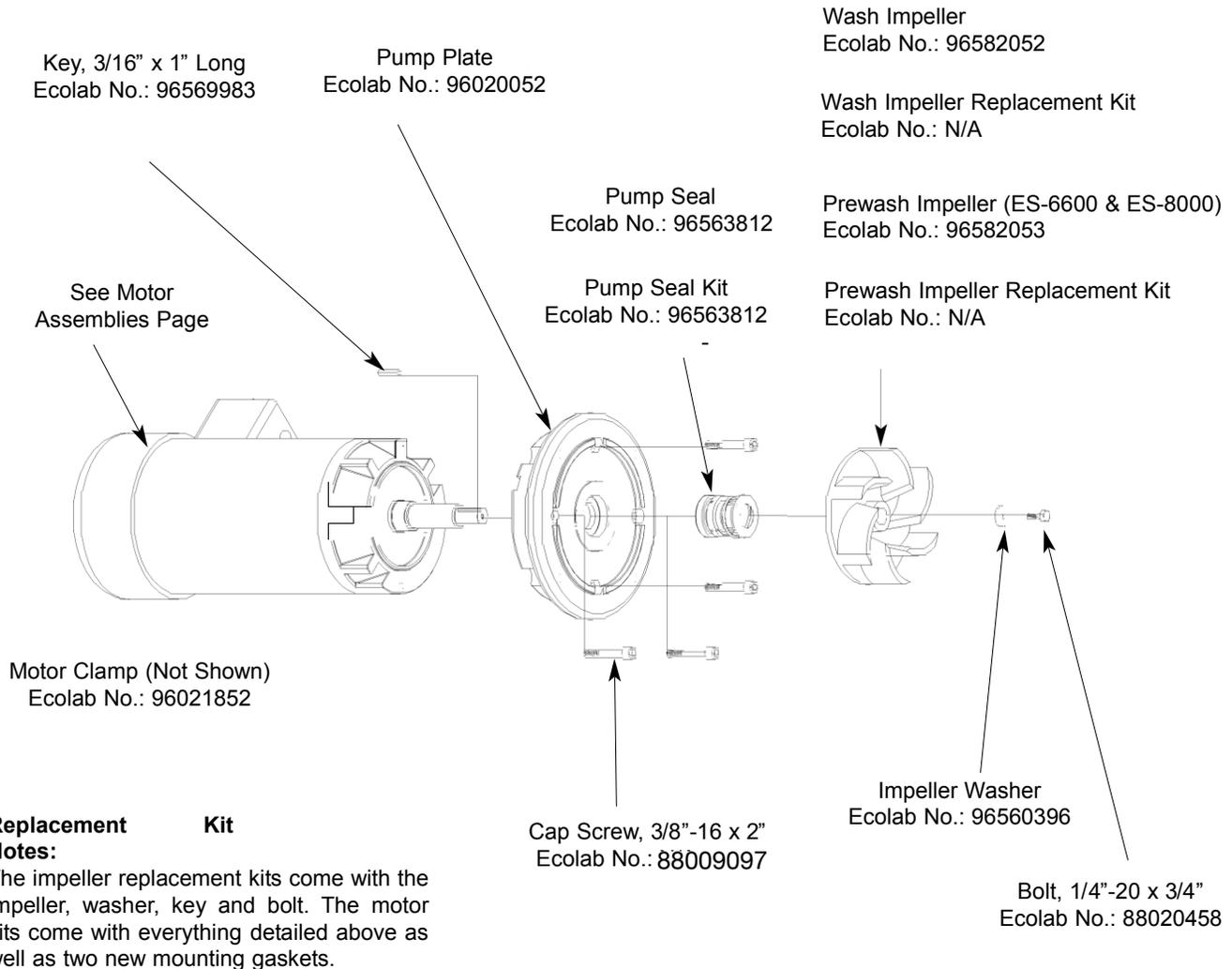
WH-66 DRAIN VALVE HANDLE ASSEMBLY/DRAIN QUENCH SYSTEM



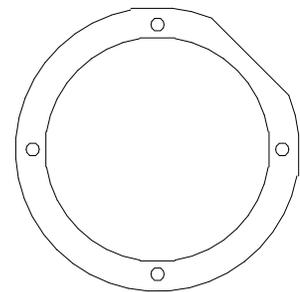
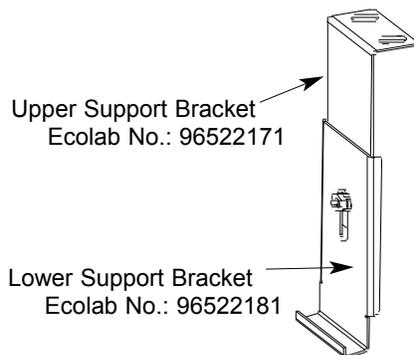
From the existing drain, attach the two additional Tees using the 1-1/2" NPT Close Nipples. Tighten the Reducers into the Tees as shown above. Attach the Modified Compression Fitting into the 1-1/2" to 1/4" Reducer. Position the bulb of the thermostat so that it rests approximately 1/4" from the bottom of the Tee. Tighten the Modified Compression Fitting as required. Attach to the incoming cold water line. Use pipe dope or thread tape as required to prevent any leaks.

6.0 PARTS SECTION

WASH PUMP ASSEMBLY



Kit, Motor Brkt Replace
Ecolab No.: 96022017



Motor Mounting Gasket
Ecolab No.: 96020060

6.0 PARTS SECTION

MOTOR ASSEMBLIES

WASH MOTOR CHART (ALL MODELS)

VOLTS	PHASE	HZ	ECOLAB NO.
208 - 230	1	60	96022454
208 - 230/460	3	60	96020045

PREWASH MOTOR CHART (66" ONLY)

VOLTS	PHASE	HZ	ECOLAB NO.
208 - 230	1	60	96022397
208 - 230/460	3	60	96021951

CONVEYOR DRIVE MOTOR CHART

VOLTS	PHASE	HZ	ECOLAB NO.
208-230	1	60	83710061
208-230/460	3	60	83710060

6.0 PARTS SECTION

PREWASH & WASH PUMP WELDMENTS

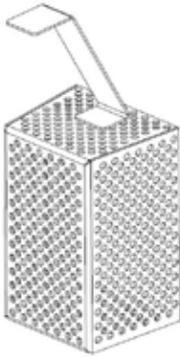
The pump weldment is secured to the pump plate (through the actual tub wall) using the following fasteners:

DESCRIPTION

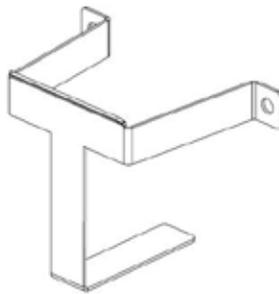
- Nut, Hex, 3/8"-16
- Washer, Flat, 3/8"
- Lockwasher, Split, 3/8"

ECOLAB No.

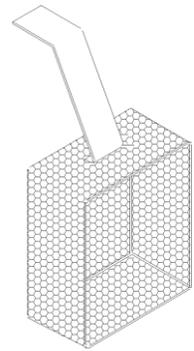
- 88422068
- 88530605
- 88521109



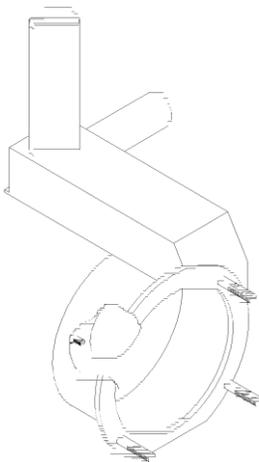
Wash Pump Inlet Strainer
Ecolab No.: 53000787



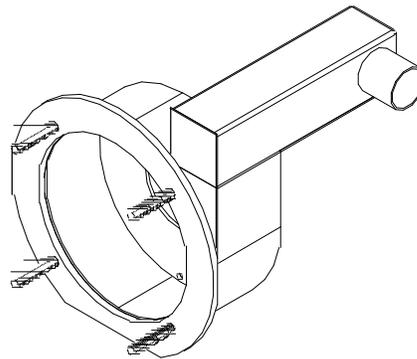
Wash Pump Strainer Bracket
Ecolab No.: 53000784



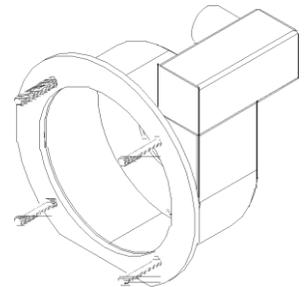
Prewash Intake Strainer
Ecolab No.: 96522227



Wash Pump Weldment
Ecolab Na 96522188



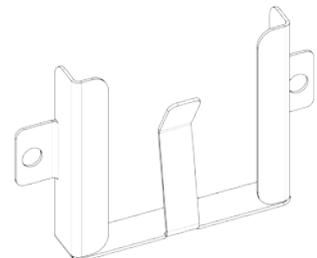
Prewash Pump Weldment
Left to Right models
Ecolab No.: 96522235



Prewash Pump Weldment
Right to Left models
Ecolab No.: 96522247

The wash and prewash pump weldments are a single part. Separate pieces of the weldment are not available for purchase. The weldment is used for the prewash pump in all models covered in this manual.

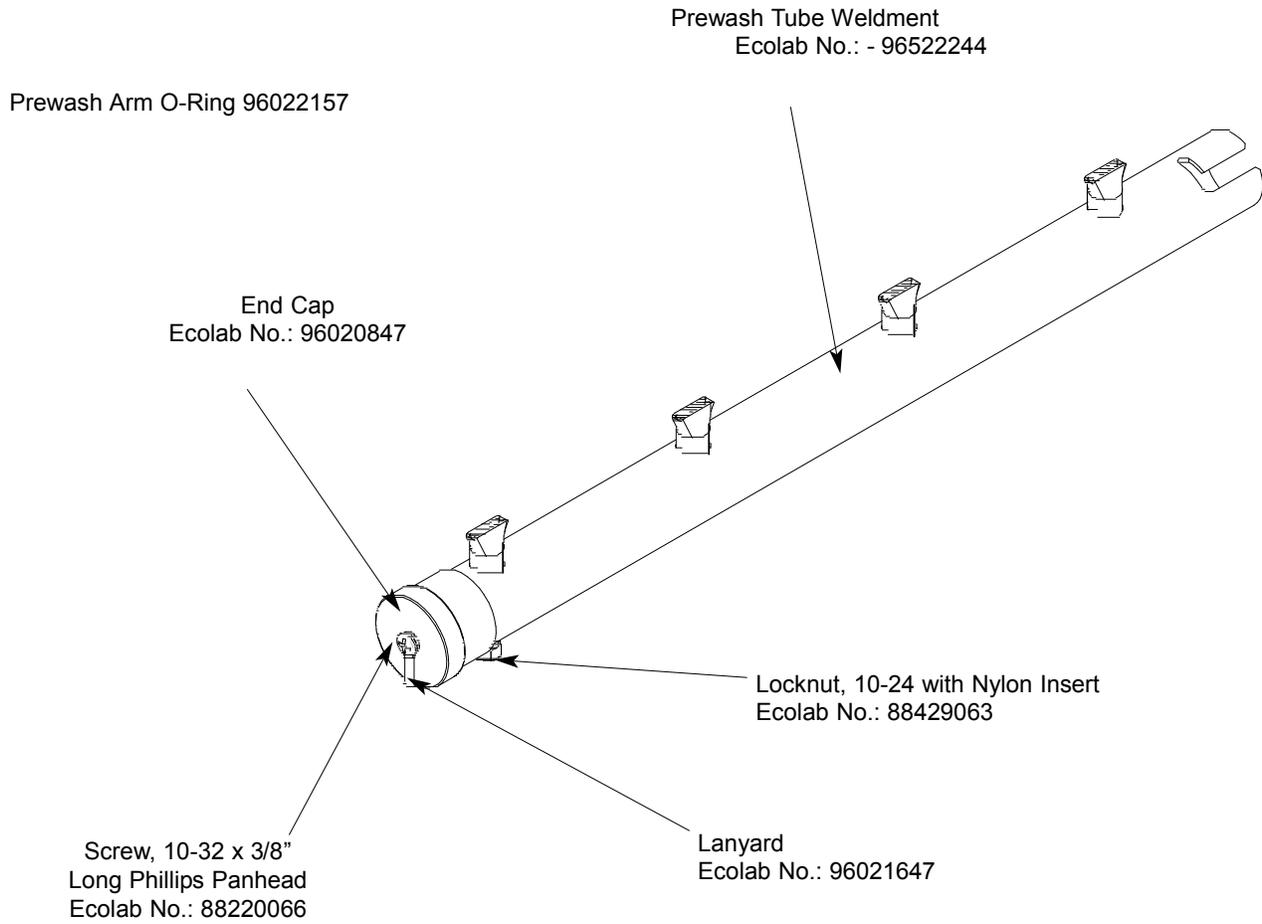
wash arm supply hose. 1.5" x 5.0"
8503-0004



Overflow Strainer Bracket
Ecolab No.: 96522129

6.0 PARTS SECTION

PREWASH SPRAY ARM ASSEMBLY

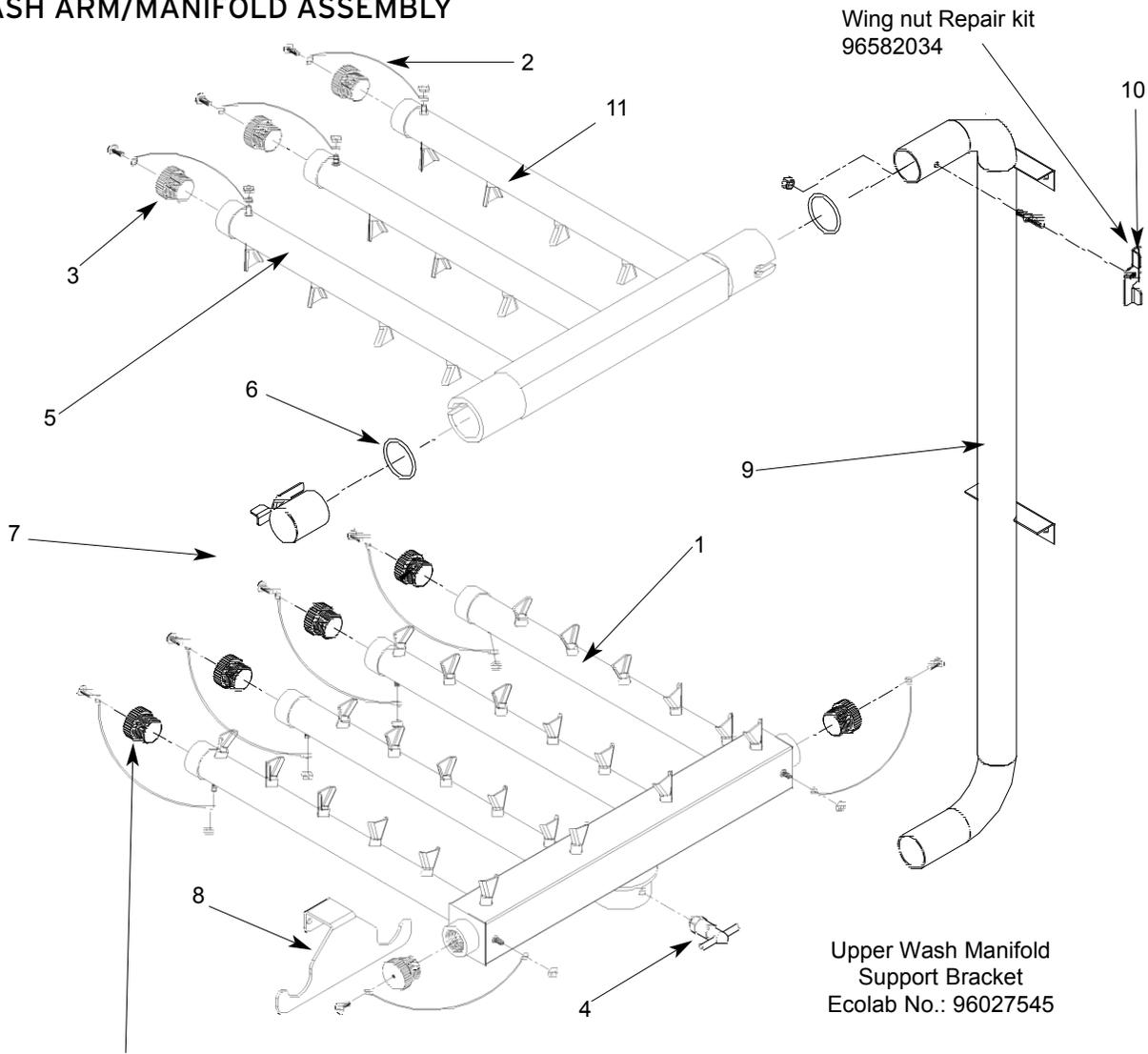


Service Note:

When replacing the 10-32 screws in the End Caps, it is recommended that a thread locking fluid be used to ensure that the screws do not back out during normal operation.

6.0 PARTS SECTION

WASH ARM/MANIFOLD ASSEMBLY



End Cap Replacement Kit
Ecolab No.: N/A

Replacement Kit Note:
The replacement kit for the end cap includes the endcap, lanyard, mounting screw and the locknut.

ITEM	QTY	DESCRIPTION	ECOLAB NO.
1	1	Lower Wash Arm Weldment	N/A
2	9	Lanyard	96522110
3	9	End Cap, Manifold	96529050
4	1	Key, Manifold Quick Release	96570528
5	1	Upper Wash Arm Weldment	
6	2	O-ring, 1-1/2" ID x 1-3/4" OD	96022116
7	1	Cap Weldment	96527600
8	1	Wash Arm Support Bracket	
9	1	Wash Manifold	
10	1	Wingnut Weldment	96522124
11	1	Complete Upper Wash Arm Assembly	96522563
12	1	Complete Lower Wash Arm Assembly	96522562
13	1	Deflector Plate	96529053

SERVICE NOTE: When replacing the 10-32 screws in the End Caps, it is recommended that a thread locking fluid be used to ensure that the screws do not back out during normal operation.

6.0 PARTS SECTION

RINSE ARM/MANIFOLD ASSEMBLY

Low Flow Final Rinse Assembly
(Manifold, Rinse Arms, Nozzles
& End Caps Only)
Ecolab No.: -
Upper Rinse Assembly: 96521026
Lower Rinse Assembly: 96521025

Final Rinse Manifold Weldment
Ecolab No.: -
Standard Height: 96522185
High Hood: 96522212

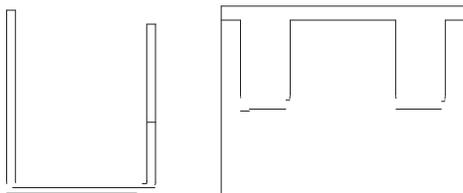
Rinse Arm Tube (2 Per)
Ecolab No.: - 96522184

Gasket, Rinse Manifold
Ecolab No.: 96020482

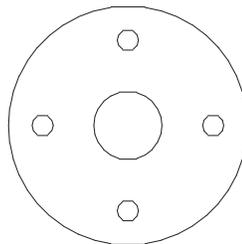
Rinse Arm End Caps
Ecolab No.: 86028008

Low Flow Energy Star Upper Nozzle
Ecolab No.: 96522224

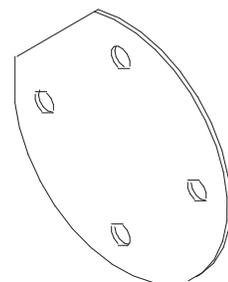
Low Flow Energy Star Lower Nozzle
Ecolab No.: 96522223



Rinse Arm Support Bracket
Ecolab No.: 96020318



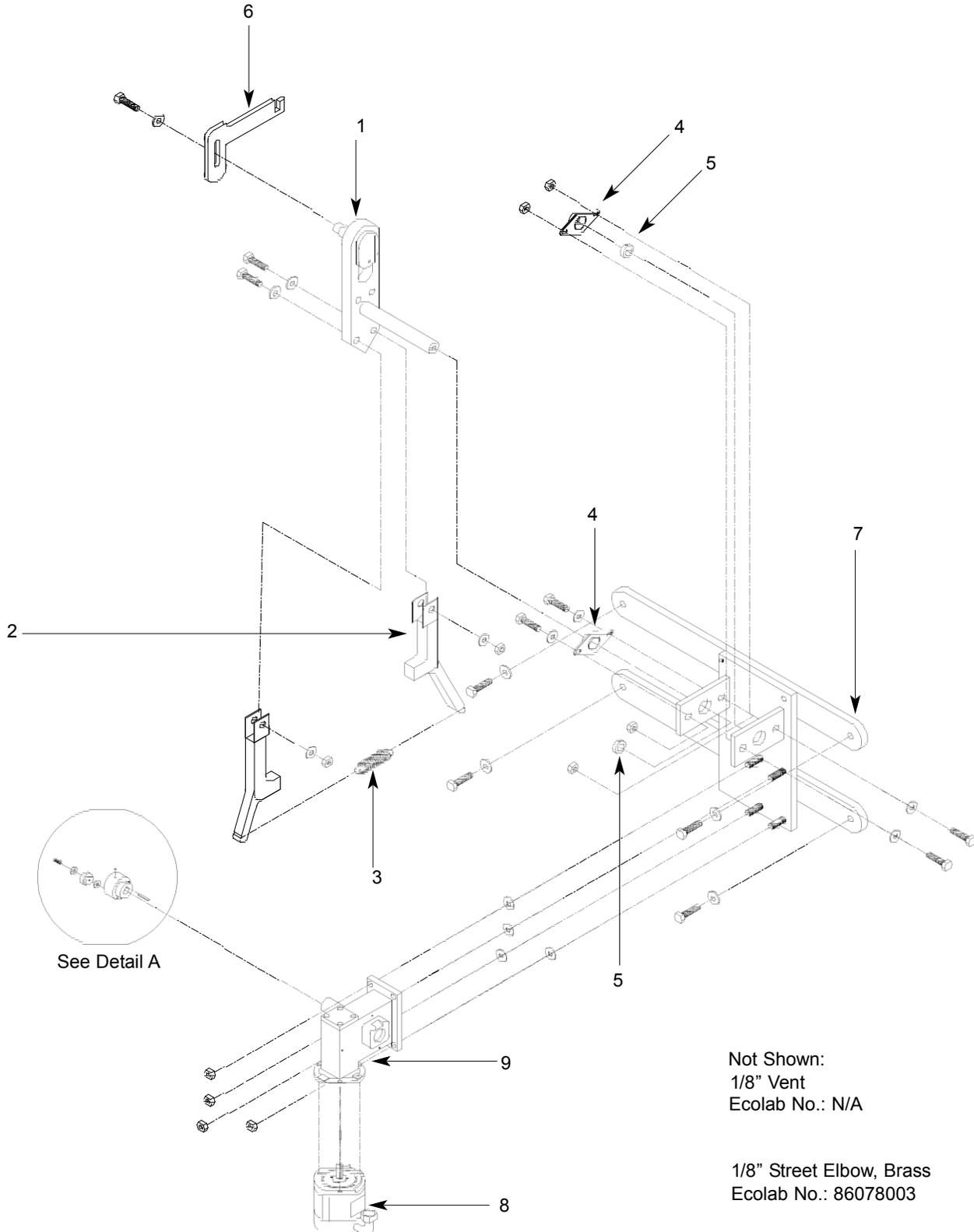
Rinse Drain Plate Gasket
Ecolab No.: 96522206



Plate, Rinse Drain
Ecolab No.: 96522143

6.0 PARTS SECTION

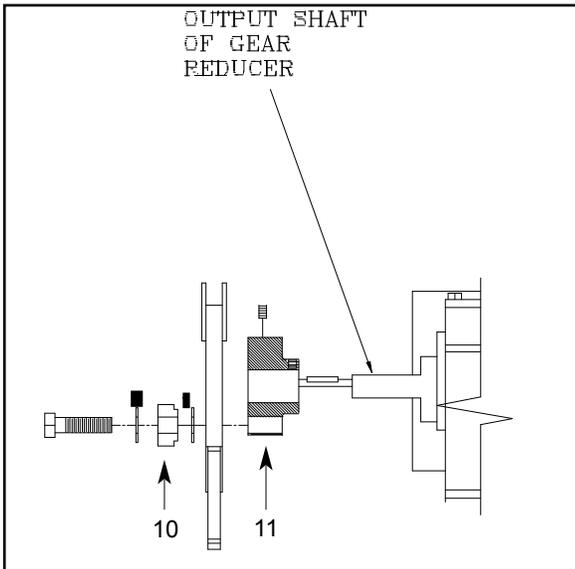
DRIVE ASSEMBLY



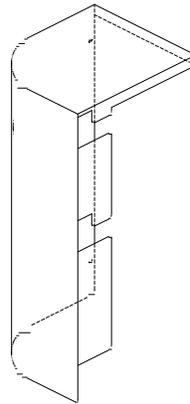
6.0 PARTS SECTION

DRIVE ASSEMBLY

ITEM	QTY	DESCRIPTION	ECOLAB NO.
1	1	Drive Plate and Rod Weldment	96522160
2	2	Coupling & Expansion Leg Weldment	96522166
3	1	Drive Spring	96021035
4	2	Pillow Block	96020920
5	2	Shaft Collar	96040506
6	1	Pawl Bar Drive Linkage Casting	96522162
7	1	Drive Motor Mounting Bracket	96522165
8	1	Drive Motor (208-230 Volt, 60 Hz, Single Phase)	83720048
		Drive Motor (208-230 Volt, 60 Hz, Three Phase)	83720047
		Drive Motor (460 Volt, 60 Hz, Three Phase)	83720047
9	1	Gear Drive	96021936
10	1	Roller Bearing	96566112
11	1	Drive Hub	96020862
12	1	Drive Key Spacer	96522161

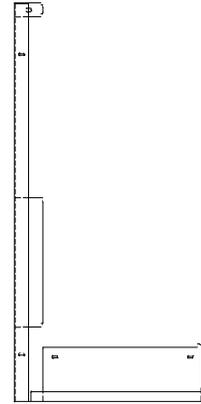


Detail A



Drive Motor Cover Front
Weldment

Ecolab No.: 96522159



Rear Drive Motor Cover
Assembly

Ecolab No.: 96522163

Replacement Kits Notes:

The replacement kits for the drive motor covers come with the weldments and the mounting hardware.

6.0 PARTS SECTION

LUBRICATION CHART FOR GEAR DRIVE

Note: The maintenance procedures detailed here are manufacturer's instructions for the WINSMITH brand of gear reducer that is installed on the rack conveyors covered in this manual.

Ambient Temperature	-30 - 15°F	16 - 50°F	51 - 95°F	51 - 95°F	96 - 131°F	96 - 131°F
Final Stage Worm Speed ¹	up to 2000 FPM	up to 2000 FPM	up to 450 FPM	above 450 FPM	up to 450 FPM	above 450 FPM
ISO Viscosity Grade	220	460	680	460	680	460 ¹
AGMA Lubricant No.	5S	#7 Compounded	#8 Compounded	#7 Compounded	8S	7S
Mobil	SHC 630	600W Super Cylinder	Extra Hecla Super	600W Super Cylinder	SHC 636	SHC 634
American Lubricants	SHC-90W	AGMA #7 Gear Oil	AGMA #8 Gear Oil	AGMA #7 Gear Oil	N/A	N/A
Castrol	Tribol 800/220	Tribol 1105-7C	Tribol 1105-8C	Tribol 1105-7C	Tribol 800/680	Tribol 800/460
Chevron	Tegra 220	Cylinder Oil W460	Cylinder Oil W680	Cylinder Oil W460	Tegra 680	Tegra 460
Conoco	Syncon R & O 220	Inca Oil 460	Inca Oil 680	Inca Oil 460	N/A	Syncon R & O 460
Exxon (Esso)	Teresstic SHP220	Spartan EP 460	Spartan EP 680	Spartan EP 460	Teresstic SHP 680	Teresstic SHP 460
Fiske Brothers	SPO-MG	SPO-277	SPO-288	SPO-277	N/A	N/A
Shell	Omala RL 220	Valvata J 460	Valvata J 680	Valvata J 460	Omala RL 680	Omala RL 460
Texaco	Pinnacle 220	Vanguard 460	Vanguard 680	Vanguard 460	Pinnacle 680	Pinnacle 460

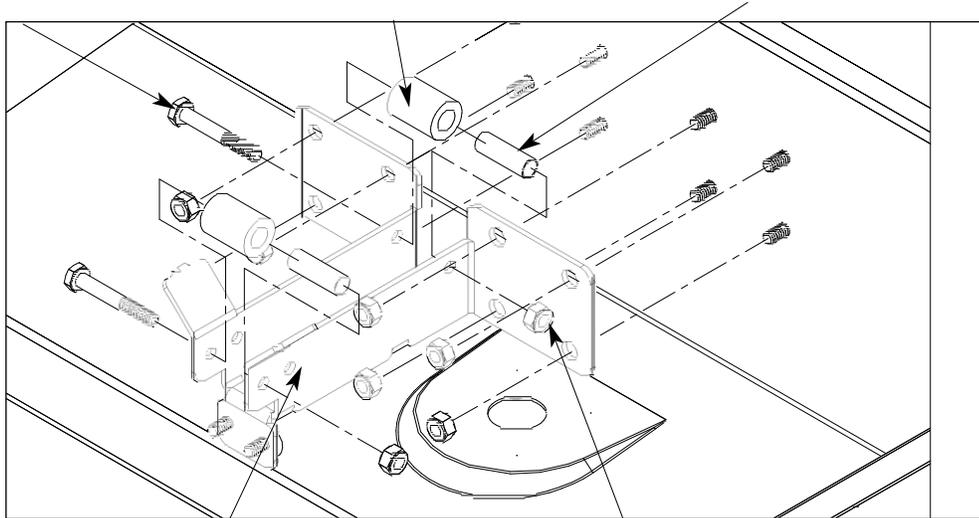
6.0 PARTS SECTION

PAWL BAR ROLLER BRACKET

Bolt, 1/4"-20 x 1-3/4" Long
Ecolab No.: 96035472

Roller, UHMW Ecolab
No.: 96022272

Roller Shaft
Ecolab No.: 96522200

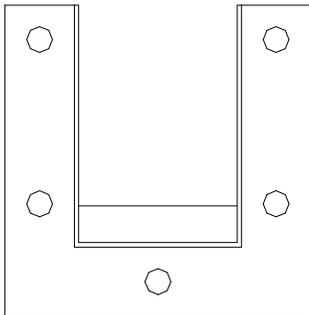


Pawl Bar Roller Bracket with Tabs
Ecolab No.: 96522158

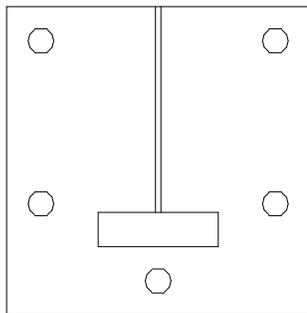
Locknut, 1/4"-20 with Nylon Insert
Ecolab No.: 88429113

Replacement Kit Notes:

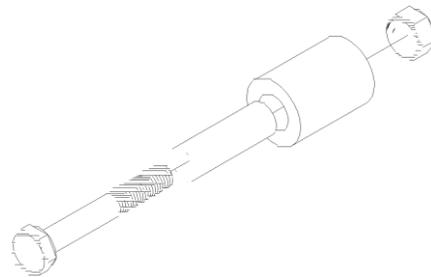
The replacement kit for the pawl bar roller comes with the roller, roller shaft, hardware and locknut as shown.



Pawl Bar Gutter Weldment
Ecolab No.: 96522150



Pawl Bar Gutter Gasket
Ecolab No.: 96522147



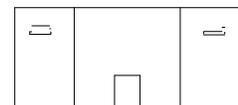
Service Note:

It is highly recommended that when changing out one guide block, that the other be changed out as well, along with the gasket.

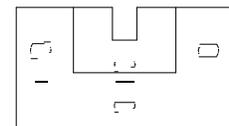
Replacement Kits Notes:

The pawl bar gutter weldment replacement kit contains the weldment, a gasket and the mounting hardware. The guide block kit contains both blocks and a gasket.

Top Guide Block
Ecolab No.: 96522155

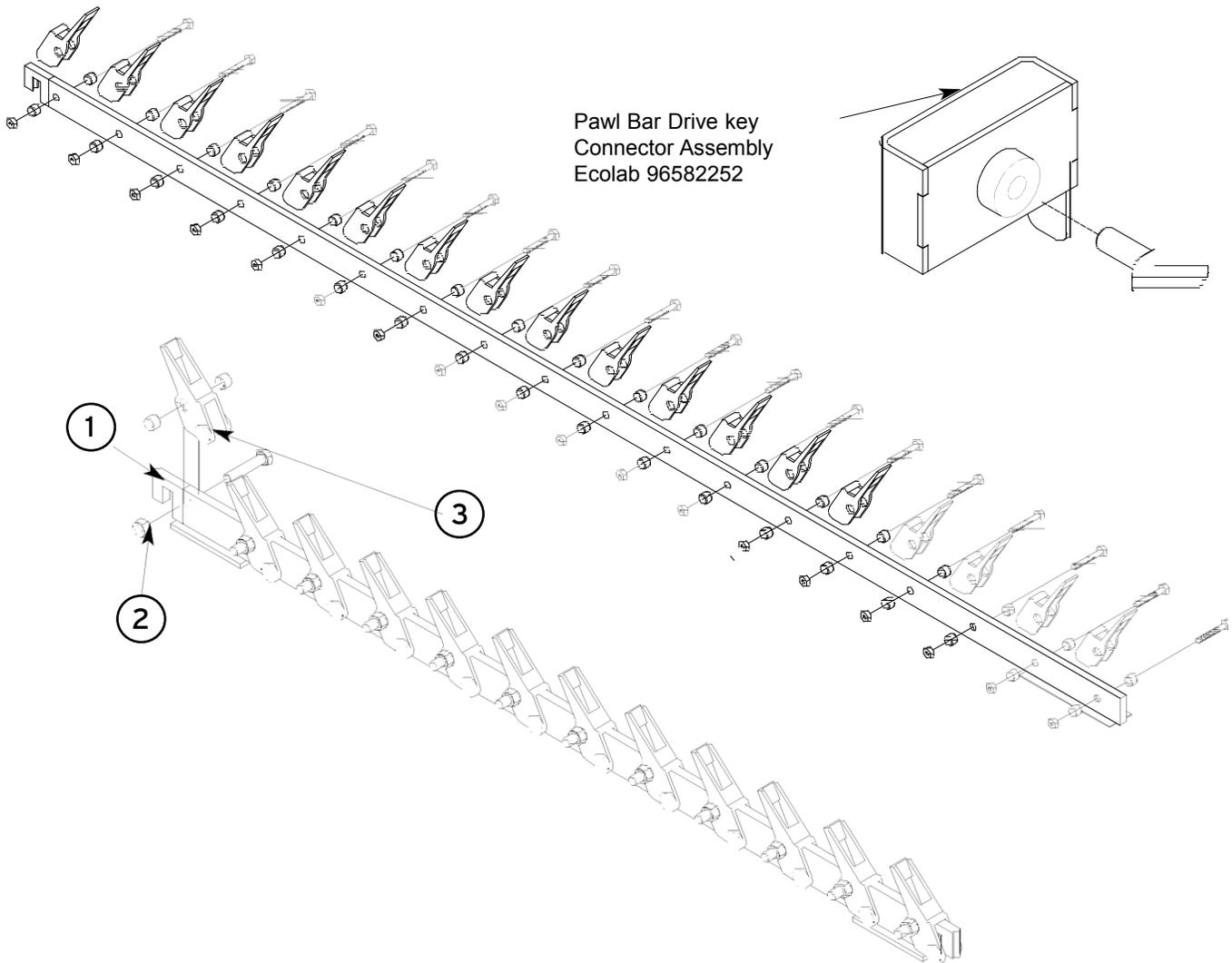


Bottom Guide Block
Ecolab No.: 96522153



6.0 PARTS SECTION

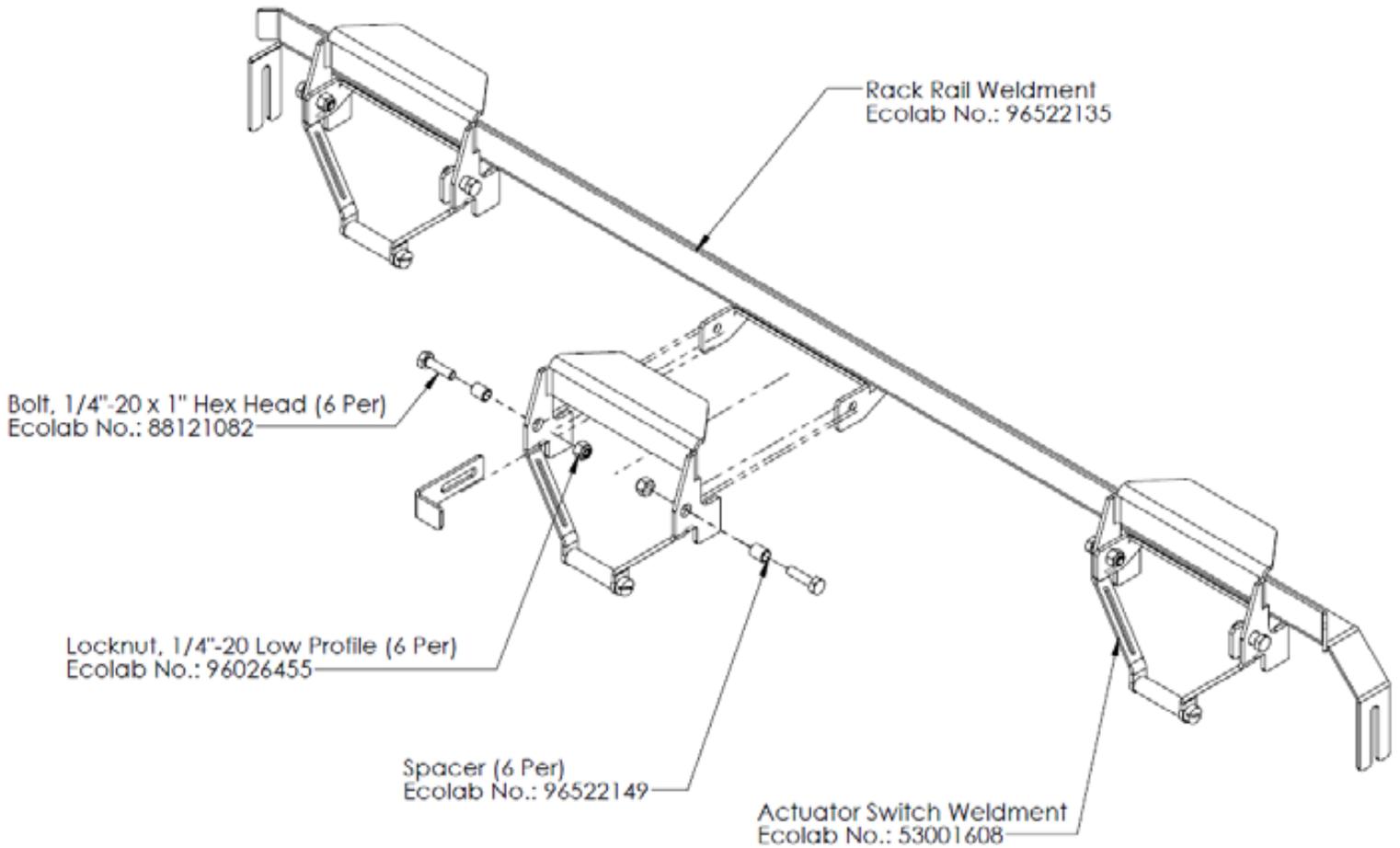
PAWL BAR ASSEMBLIES



ITEM	QTY	DESCRIPTION	ECOLAB NO.
1	1	Pawl Bar Weldment	96522152
	1	Pawl Bar Weldment	96522241
2	24	Pawl Bar Dog Spacer	96522151
	36	Pawl Bar Dog Spacer	96522121
3	12	Pawl Bar Dog Casting	96522154
	18	Pawl Bar Dog Casting Extended Dog	96522154 96027610

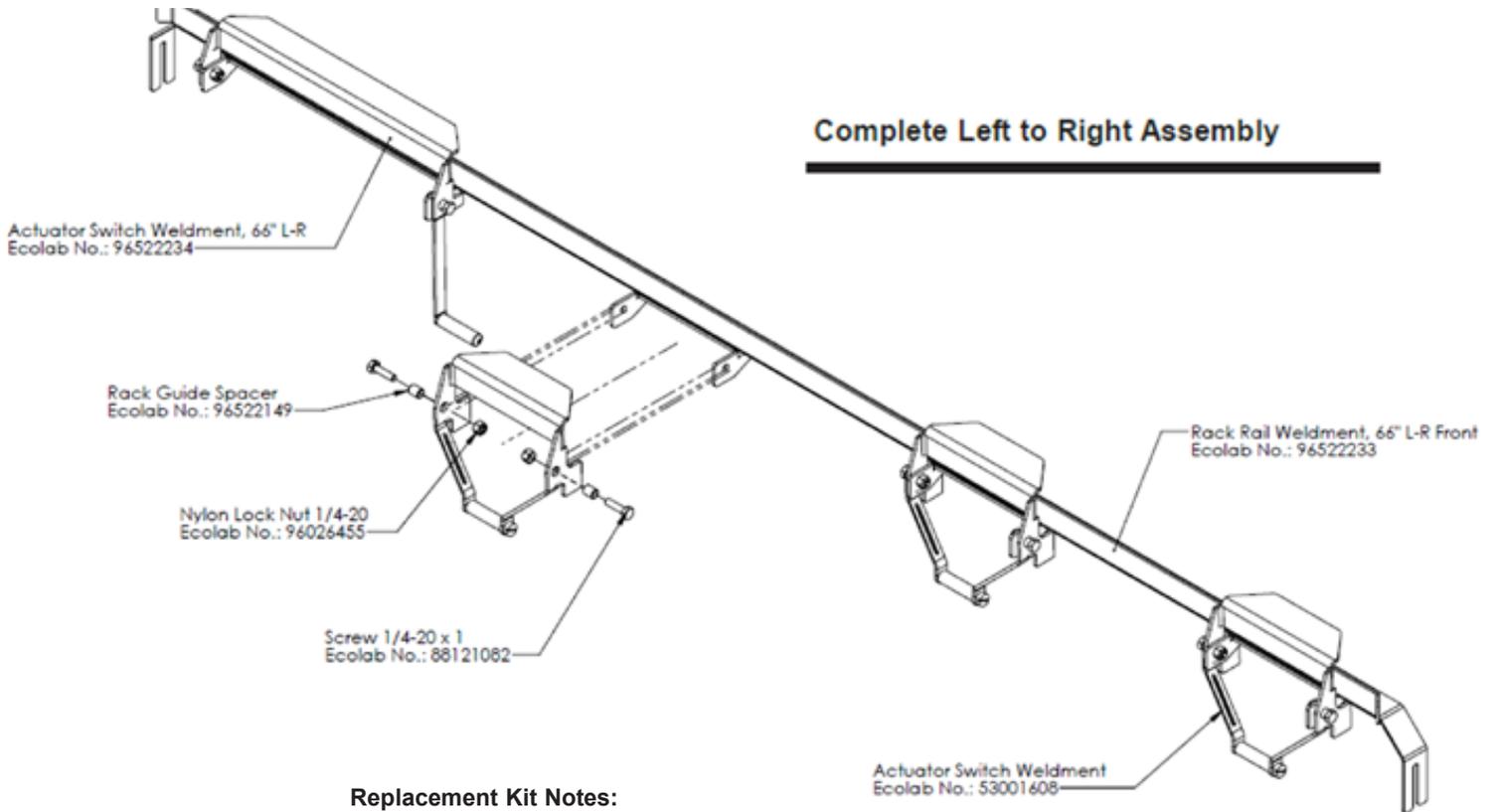
6.0 PARTS SECTION

EC44-LW/EC44HH-LW RACK RAIL ASSEMBLY



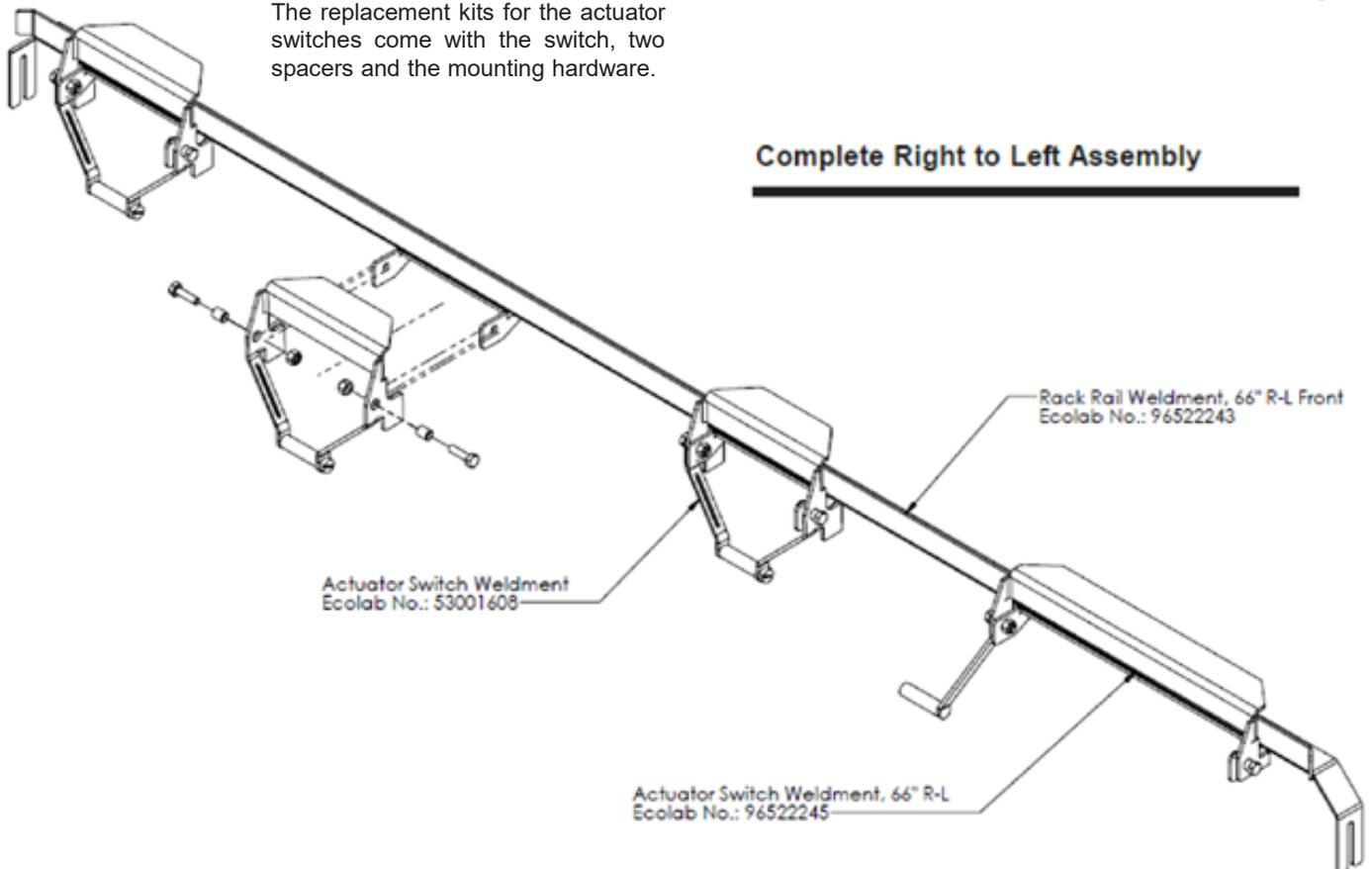
6.0 PARTS SECTION

EC66-LW/EC66HH-LW RACK RAIL ASSEMBLIES



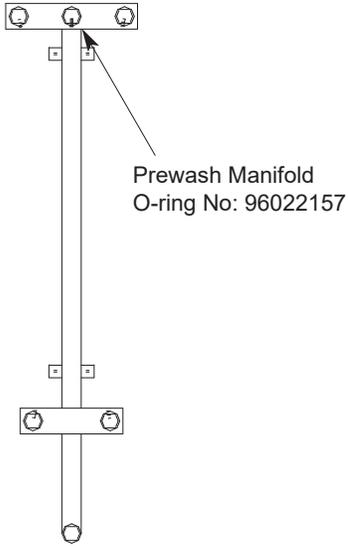
Replacement Kit Notes:

The replacement kits for the actuator switches come with the switch, two spacers and the mounting hardware.



6.0 PARTS SECTION

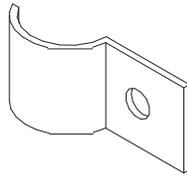
MANIFOLDS, MISCELLANEOUS PARTS & WELDMENTS



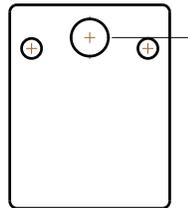
Prewash Manifold Weldment
Ecolab No.:
Standard Height: 96522237
High Hood: 96522272

**Replacement Kit
Note:**

The kit for the hole direction plate comes with the plate, a new gasket and the mounting hardware.

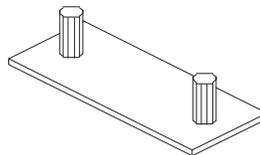


Pipe Clamp
Ecolab No.: 96572466



Fill Plate
Ecolab No.: 96522282

Wash Fill Plate Gasket
No.: 96522281

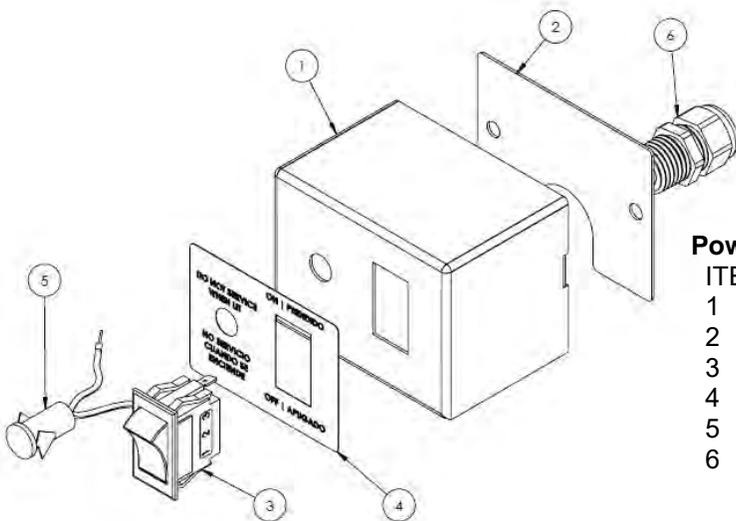


Hole Direction Cover Weldment
Ecolab No.: 96522193



Wash Manifold Weldment
Ecolab No.: -
Standard Height: 96522125
High Hood: 96522210

Hole Direction Plate Replacement
it

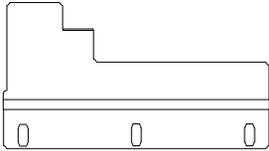


Power Switch Enclosure Assembly

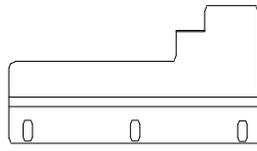
ITEM	T	DESCRIPTION	ECOLAB NO.
1	1	Switch Enclosure	53001610
2	1	Enclosure Back Cover	53001609
3	1	Toggle Switch	96584024
4	1	Switch Enclosure Label	53001605
5	1	Ready to Operate Light	96583703
6	1	Heyco Fitting	83311225
	1	Cable Harness	53001603
	1	Cable Harness (66" R-L)	53001604

6.0 PARTS SECTION

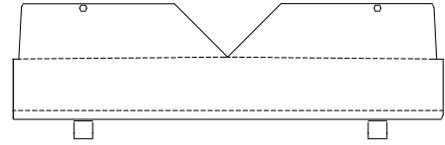
STRAINERS, DRESS PANELS, MISCELLANEOUS PARTS AND WELDMENTS



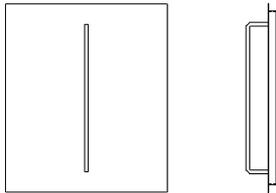
Plate, Left Water Directional
Ecolab No.: 96522232



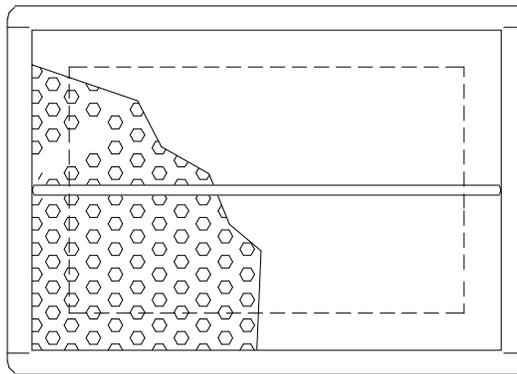
Plate, Right Water Directional
Ecolab No.: 96522230



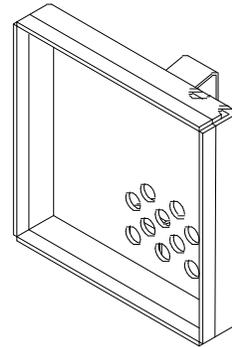
Splash Shield Weldment
Ecolab No.: 96522178



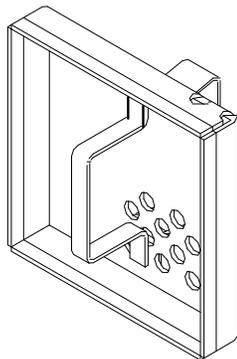
Run Off Sheet Weldment
Ecolab No.: 96522229



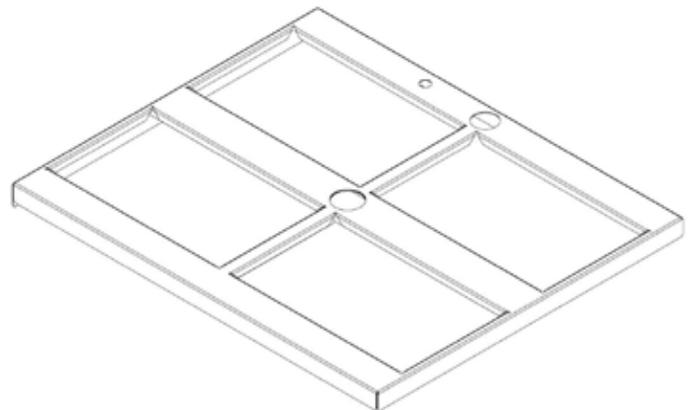
Tub Strainer Weldment
Ecolab No.: 96522133



Screen Strainer with Handle
Weldment
Ecolab No.: 96522120



Drain Guard Strainer Weldment
Ecolab No- 96522130

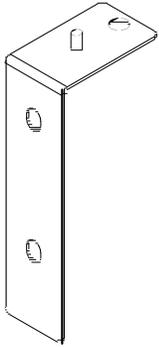


Strainer Tray Support Weldment
Ecolab No- 96522137

Dress Panel
Ecolab No: EC-44: 96522142
EC-66 L-R: 96522240
EC-66 R-L: 96522246

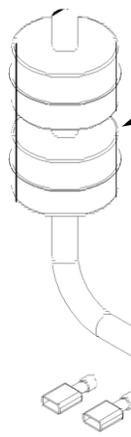
6.0 PARTS SECTION

FLOAT SWITCH COMPONENTS/SCRAP BASKETS



Float Support Bracket
Ecolab No.: - 96522172

Float Switch Support Bracket
Replacement Kit
-

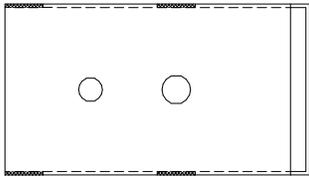


Prewash Float Switch, 45" Lead
Ecolab No.: 96021407

Wash Float Switch, Dual
Ecolab No.: 53001290

1/2" Flat Washer
Ecolab No.: 88520069

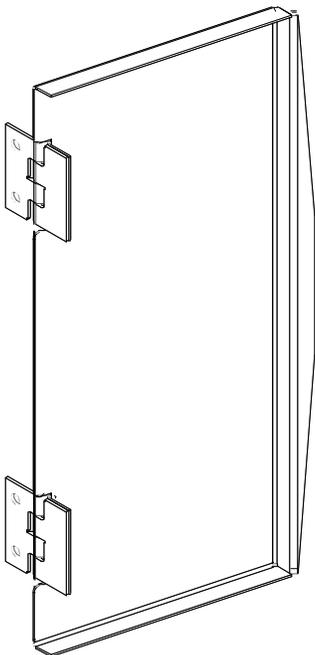
Hex Nut (1/2"-13 Thread)
Ecolab No.: 88430517



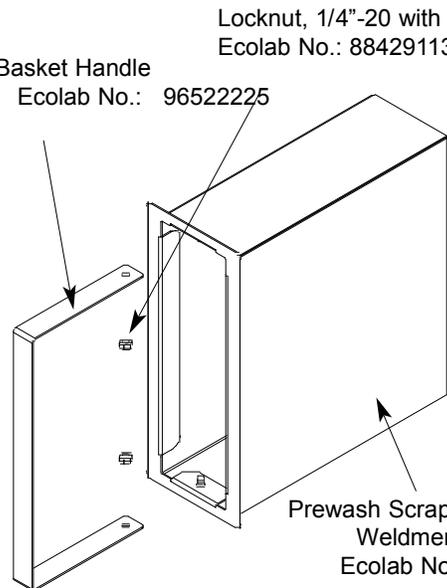
Float Switch Cover
Ecolab No.: 96522138

Service Agent Note:

Remember that when reinstalling the float switch that the flat washer goes inside against the tub wall while the nut is on the outside of the tub.



Scrap Basket Lid
Ecolab No.: 96522226



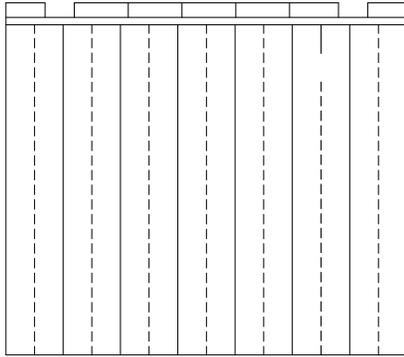
Locknut, 1/4"-20 with Nylon Insert
Ecolab No.: 88429113

Scrap Basket Handle
Ecolab No.: 96522225

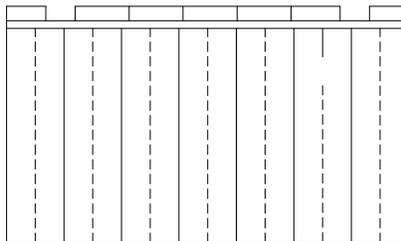
Prewash Scrap Basket
Weldment
Ecolab No.: 96522249

6.0 PARTS SECTION

CURTAINS/TUB MAGNETS



Curtain, 25" Long x 20-1/2" Wide
Ecolab No.: 53001271



Curtain, 12" Long x 20-1/2" Wide
Ecolab No.: 53001265

Additional Curtain Lengths

- 19" Curtain 53001267
- 21" Curtain 53001269

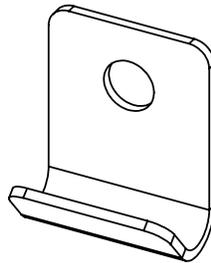


Short Curtain Decal
Ecolab No.: 92632061



Long Curtain Decal
Ecolab No.: 92632062

NOTE: Curtain hooks have been consolidated to one standard design which is known to improve wash sump temperatures.

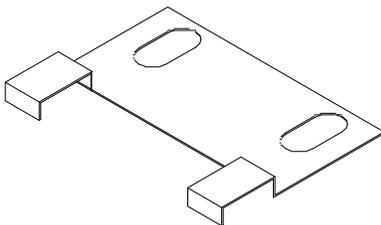


Common Curtain Hook
Ecolab No.: 96522098



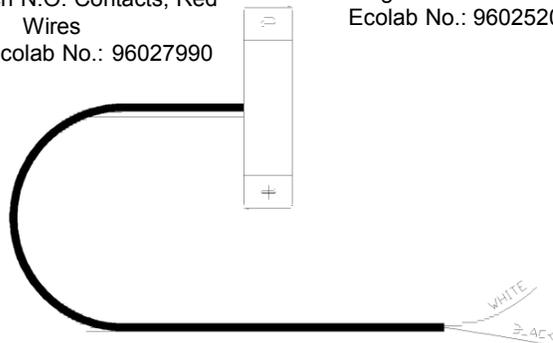
Curtain Rod
Ecolab No.: 96522176

Cycle/Paddle Magnetic Reed Switch N.C. Contacts, Black Cord
Ecolab No.: 96021464



Limit Switch Bracket
Ecolab No.: 96529029
Limit Switch Bracket (Horizontally Adjustable)
Ecolab No.: 53002166

Wash Door/Prewash Door Magnetic Reed Switch N.O. Contacts, Red Wires
Ecolab No.: 96027990

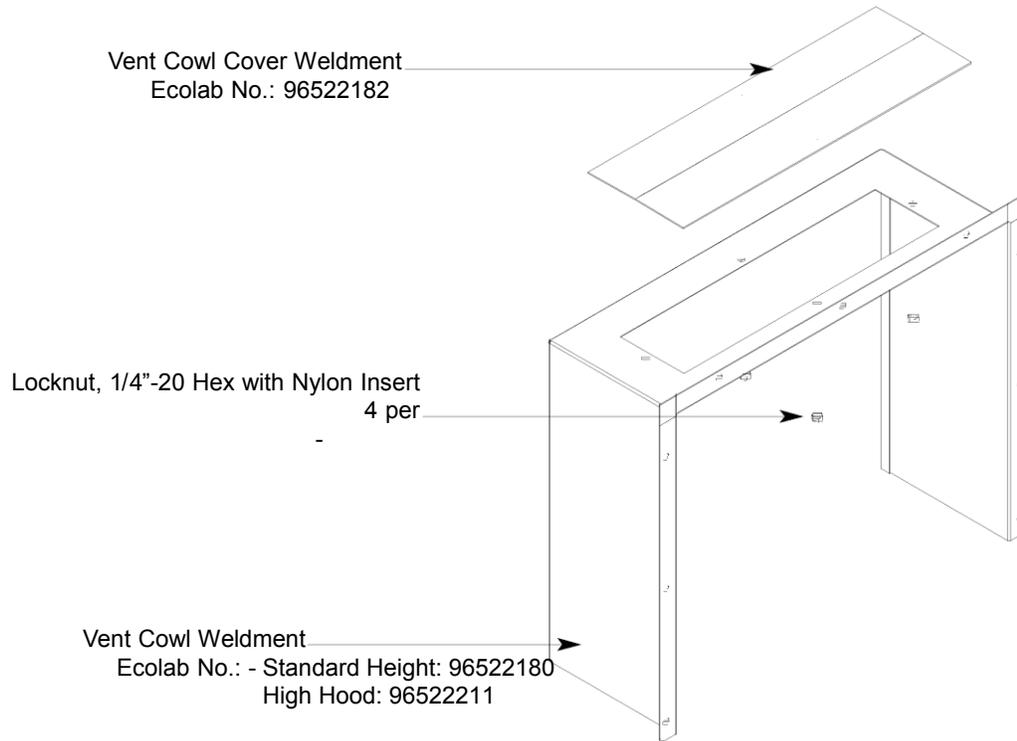


Magnet for Door Reed Switch
Ecolab No.: 96025200

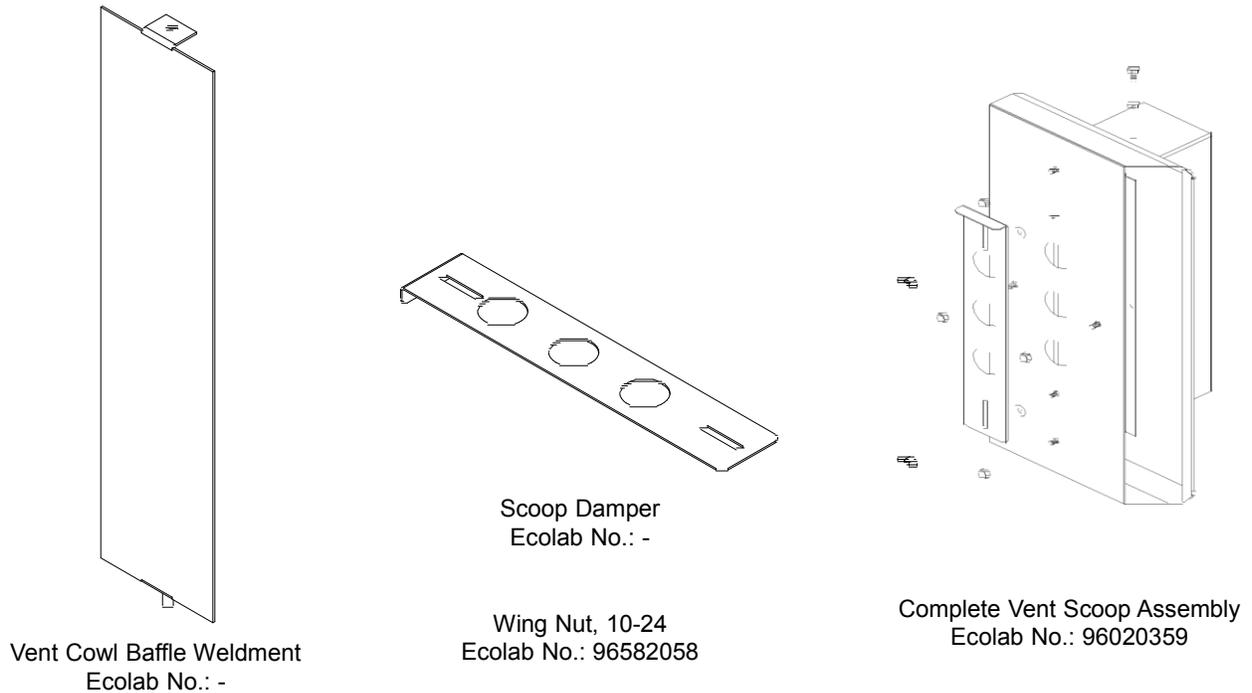
Service Note:
The cord for the conveyor switch needs to be cut to length in the field and have the pink terminal applied there.

6.0 PARTS SECTION

VENT COWL ASSEMBLY/VENT SCOOP OPTION

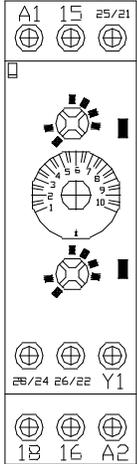


VENT SCOOP OPTION

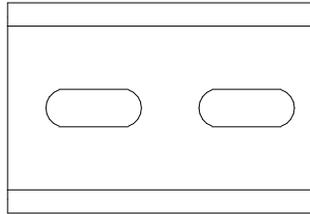


6.0 PARTS SECTION

EXHAUST FAN CONTROL/TABLE LIMIT SWITCH OPTIONS



Delay Timer
Ecolab No.: 96031513

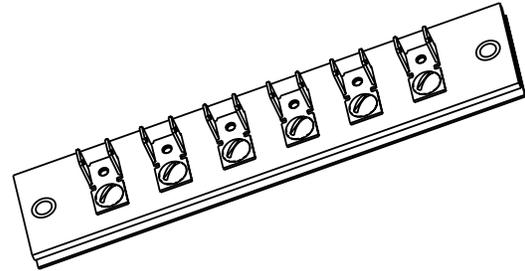


6" Din Rail
Ecolab No.: 96021183

8.5" Din Rail
Ecolab No.: 53001815

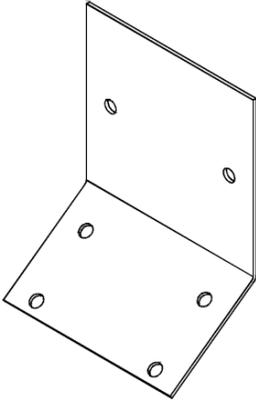
**FAN LOAD ON TIMER OUTPUT
5A, 1/4HP, 240 V AC MAX**

Decal, Fan Load
Ecolab No.: N/A



Terminal Board
Ecolab No.: 83105008

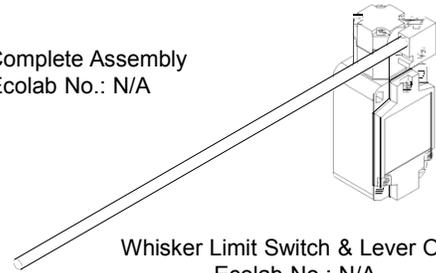
Exhaust Fan Kit: Contains all necessary components and in depth instructions to install on Apex HT or Ecolab Conveyor
Ecolab No.: 96521021



Whisker Limit Switch Mounting
Bracket
Ecolab No.: N/A

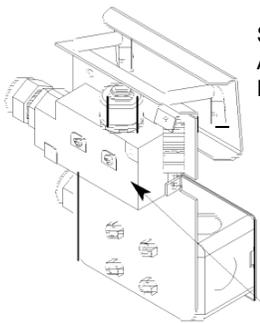
12' Complete Assembly
Ecolab No.: 96023726

15' Complete Assembly
Ecolab No.: N/A



Whisker Limit Switch & Lever Only
Ecolab No.: N/A

Rack Saver Photoelectric Limit Switch Assembly
Ecolab No.: 92900070

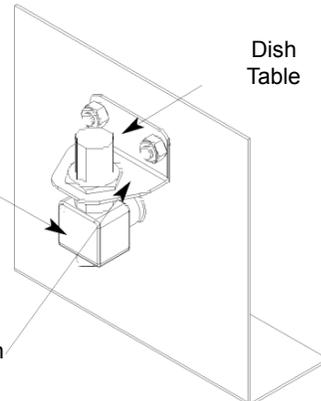


Striker Plate Limit Switch
Assembly
Ecolab No.: 96202866

Limit Switch
Ecolab No.: N/A

Proximity Limit Switch
Sensor
Ecolab No.: N/A
06685-002-94-15

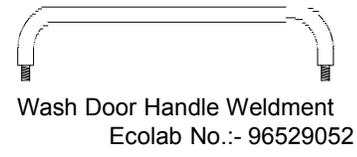
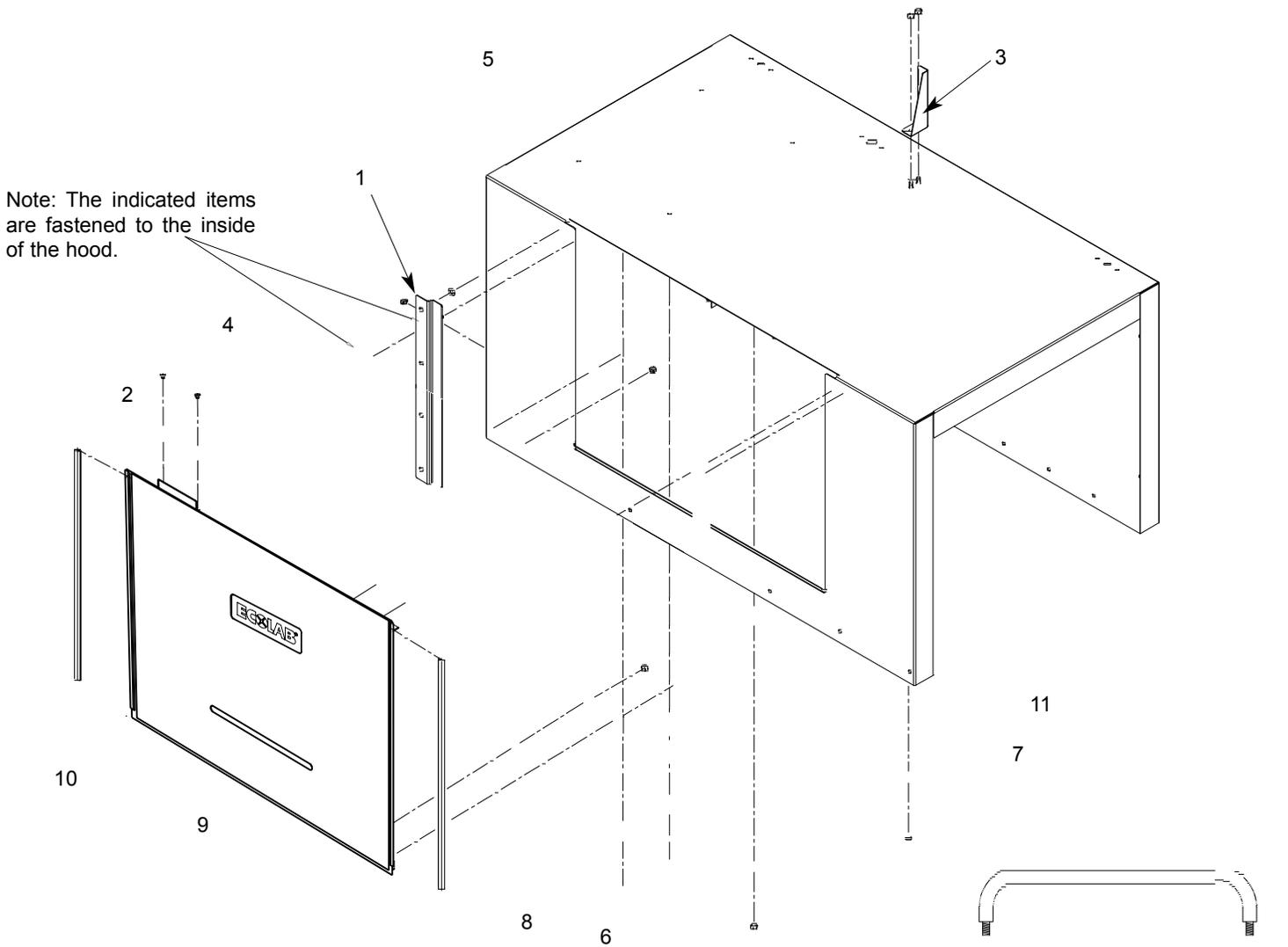
Bracket, Proximity Switch
Ecolab No.: N/A



Dish
Table

6.0 PARTS SECTION

DOOR ASSEMBLY

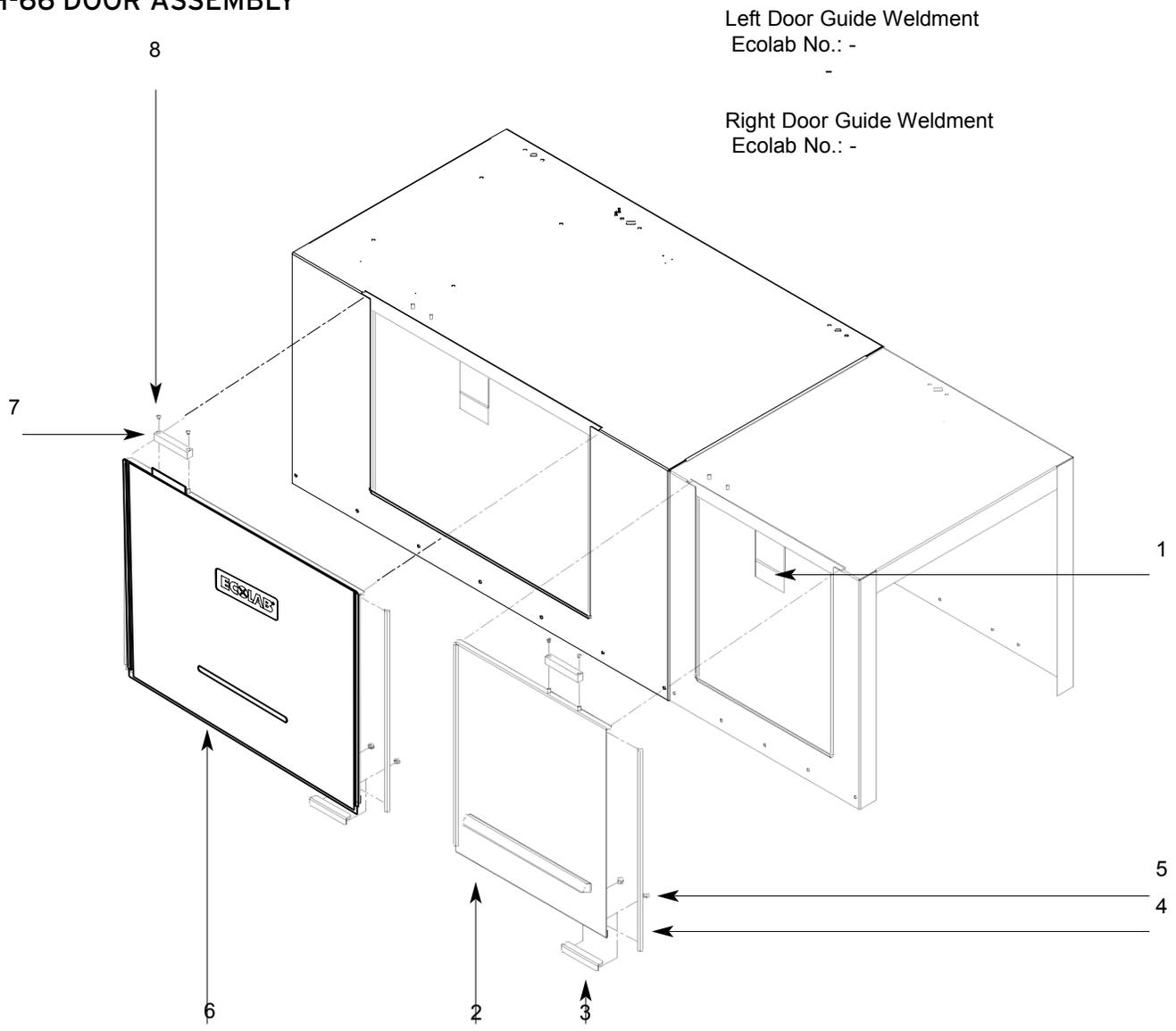


ITEM	QTY	DESCRIPTION	ECOLAB NO.
1	1	Door Guide, Left	96522141
2	1	Magnet, Reed Switch	96025200
3	1	Plumbing Support Bracket	96522131
4	1	Support, Door	96522119
5	1	Door Catch	96522140
6	1	Upper Wash Arm Bracket	
7	1	Splash Shield Weldment	
8	2	Door Stop Weldment	96041611
9	1	STANDARD HEIGHT WASH DOOR ASSEMBLY	96522274
		HIGH HOOD WASH DOOR ASSEMBLY	96522275
10	2	Door Glide	96522111
11	1	Door Guide, Right	96522139

Screw for handle
Ecolab No: 88121090

6.0 PARTS SECTION

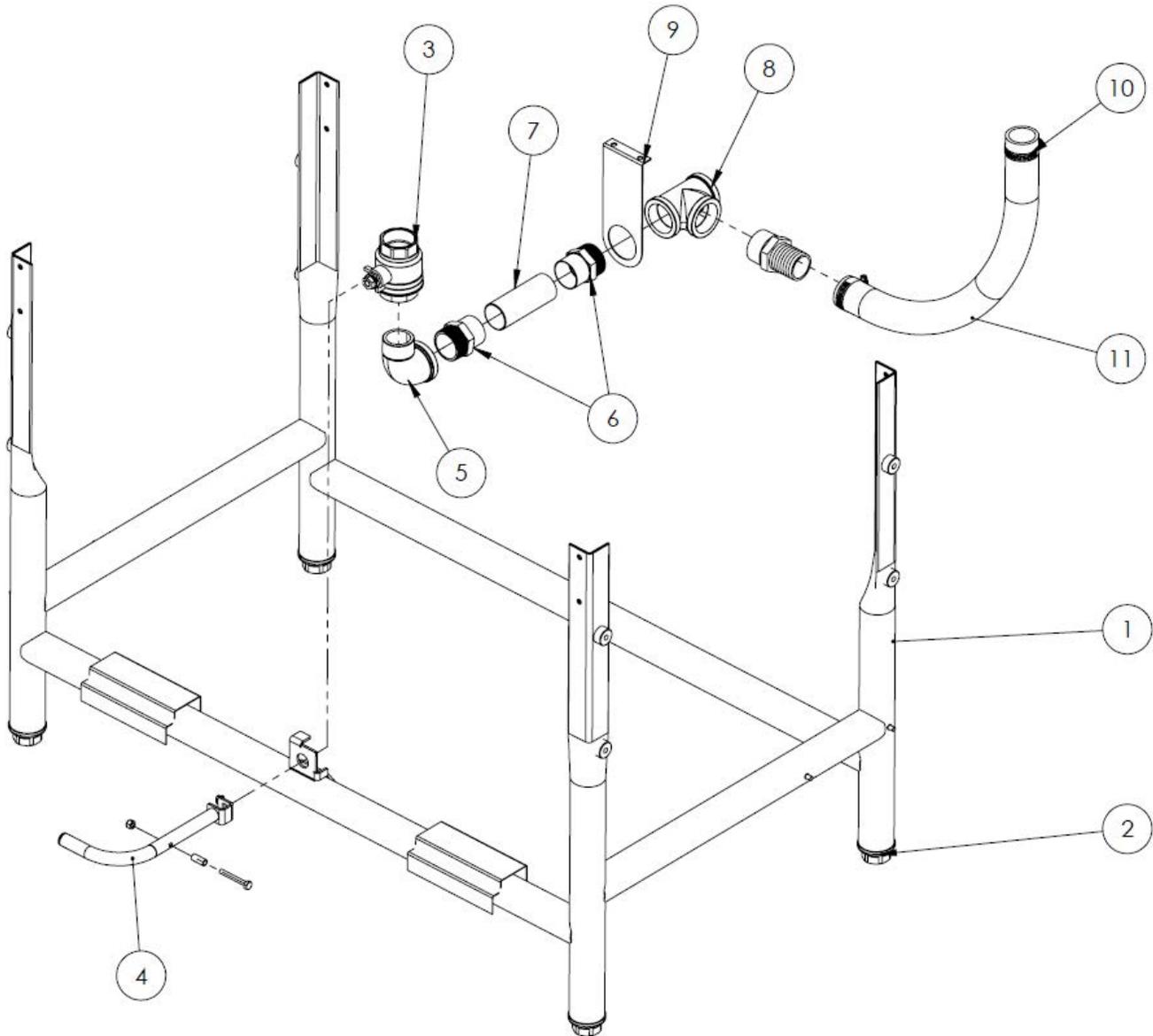
WH-66 DOOR ASSEMBLY



ITEM	QTY	DESCRIPTION	ECOLAB NO.
1	2	Door Catch Weldment	96522140
2	1	Prewash Door Weldment Standard Height High Hood	96522261 96522270
3	4	Door Guide	96522111
4	4	Locknut, 1/4"-20 with Nylon Insert	88429113
5	1	Wash Door Weldment Standard Height High Hood	96522274 96522275
6	2	Door Switch Magnet	96025200
7	4	Screw, 8-32 x 1/4" Long	
8	1	Wash Door Hood Support	
9	1	Prewash Door Hood Support	
10	1	Door Handle	96529052

6.0 PARTS SECTION

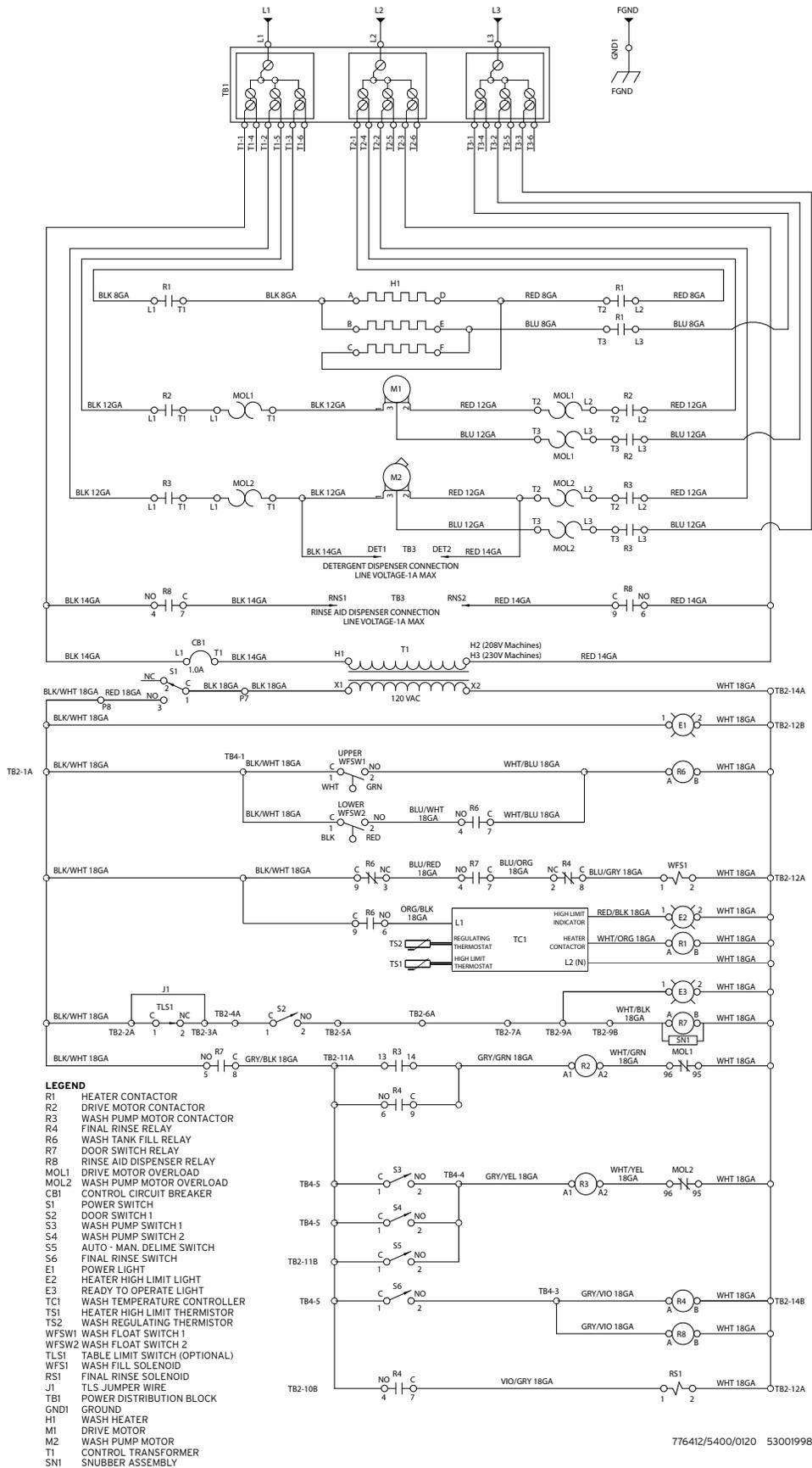
DRAIN PLUMBING ASSEMBLY/FRAME WELDMENTS



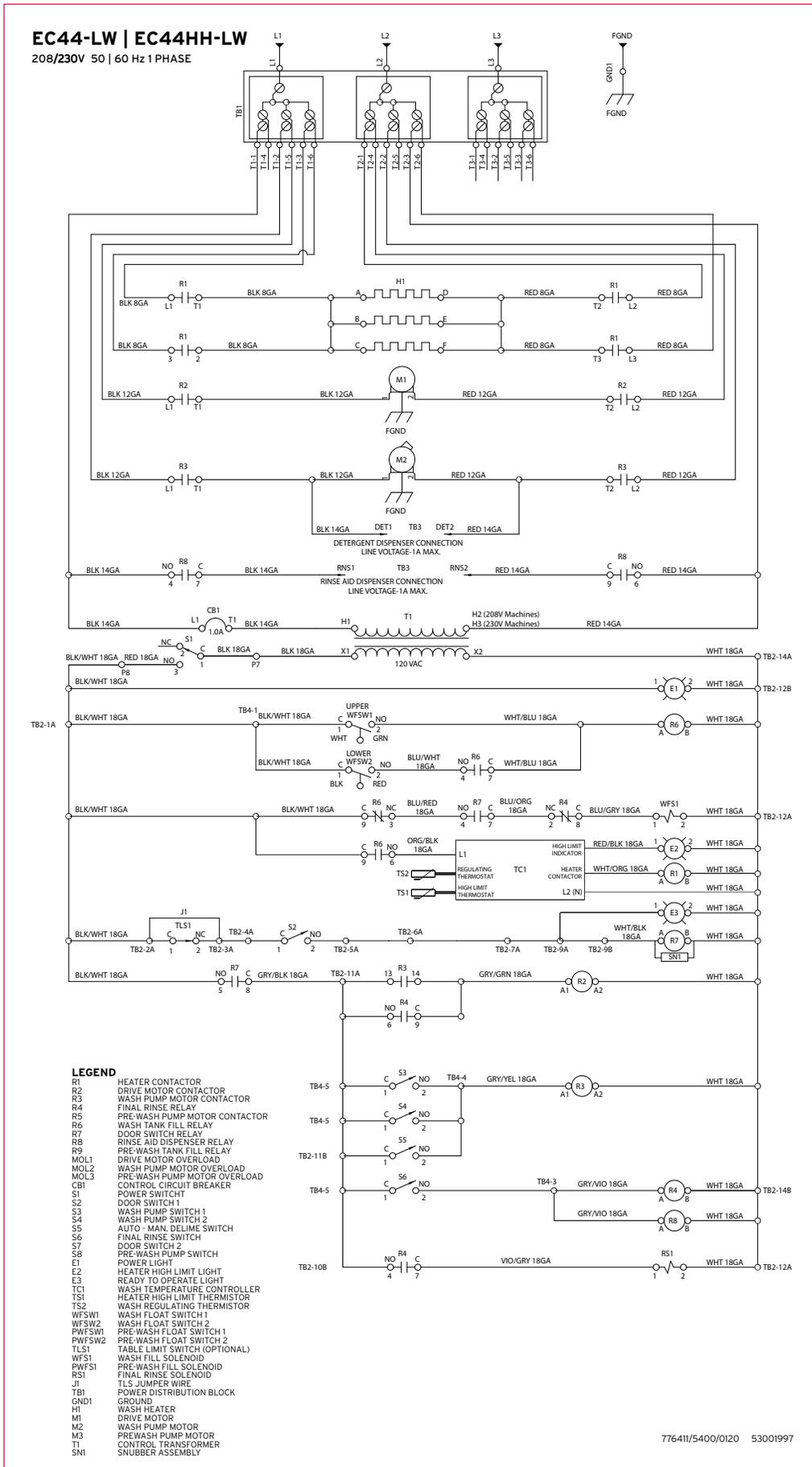
ITEM	QTY	DESCRIPTION	ECOLAB NO.
1	1	Frame Weldment, EC-44	96522156
	1	Frame Weldment, EC-66 (Left to Right)	96522260
	1	Frame Weldment, EC-66 (Right to Left)	96522266
2	4	Bullet Foot	96023692
3	1	Ball Valve, 1-1/2" NPT	96020151
4	1	Ball Valve Handle Assembly	96522145
5	1	Elbow, Brass, Street, 1-1/2" NPT	96030085
6	2	Adapter, 1-1/2" Male NPT x Tube	96022595
7	1	Tube, Copper, 1-1/2" x 4-1/4" Long	Buy Locally
8	1	Tee, Brass, 1-1/2" x 1-1/2" x 1-1/2" FNPT	96020201
9	1	Drain Plumbing Support Bracket	96522174
10	2	2" Hose Clamp	
11	1.833 FT	Tubing, 1-1/2" ID Polybrade	

7.0 ELECTRICAL SCHEMATICS

EC44-LW | EC44HH-LW
208/230V 50 | 60 Hz 3 PHASE

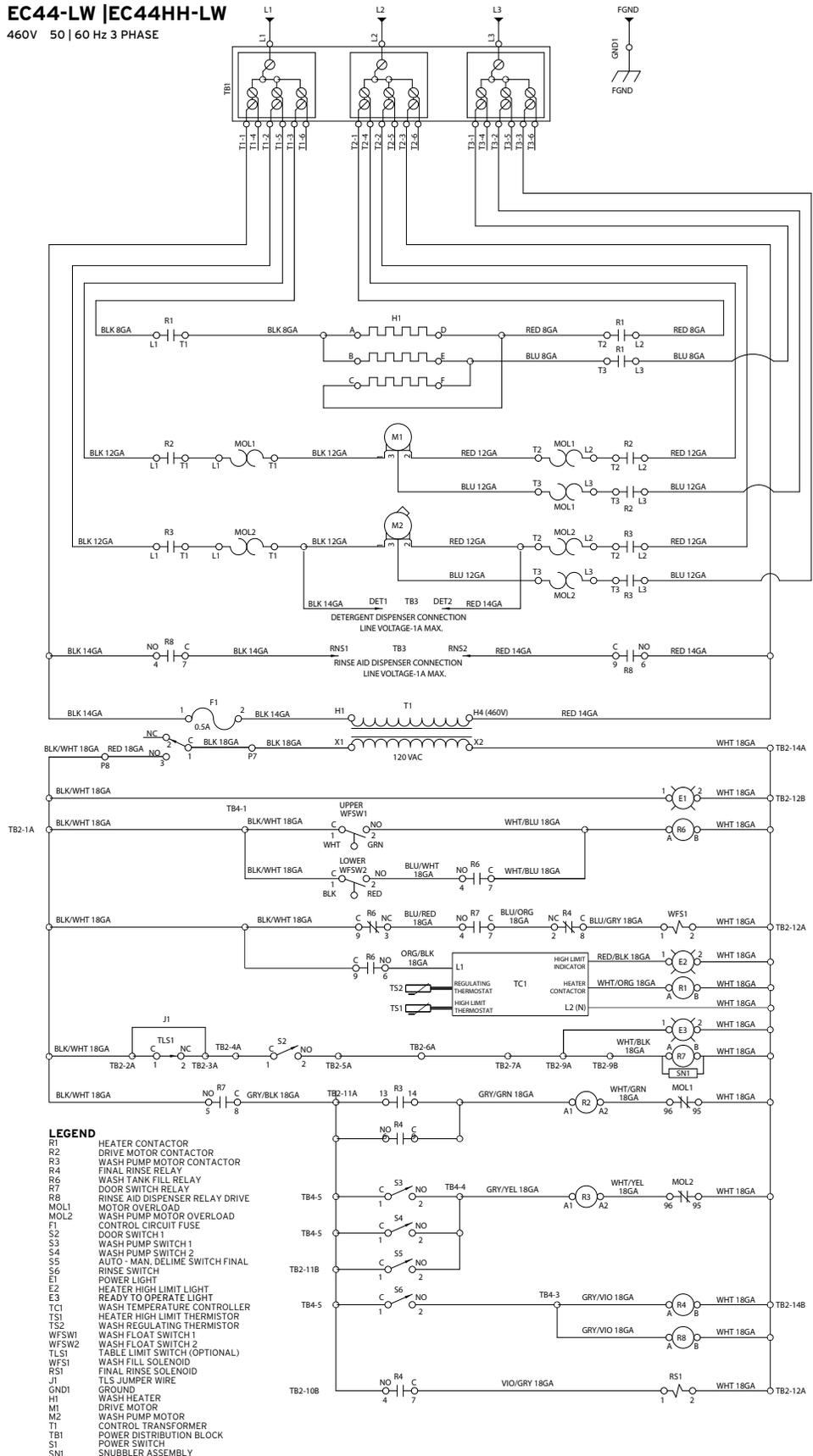


7.0 ELECTRICAL SCHEMATICS



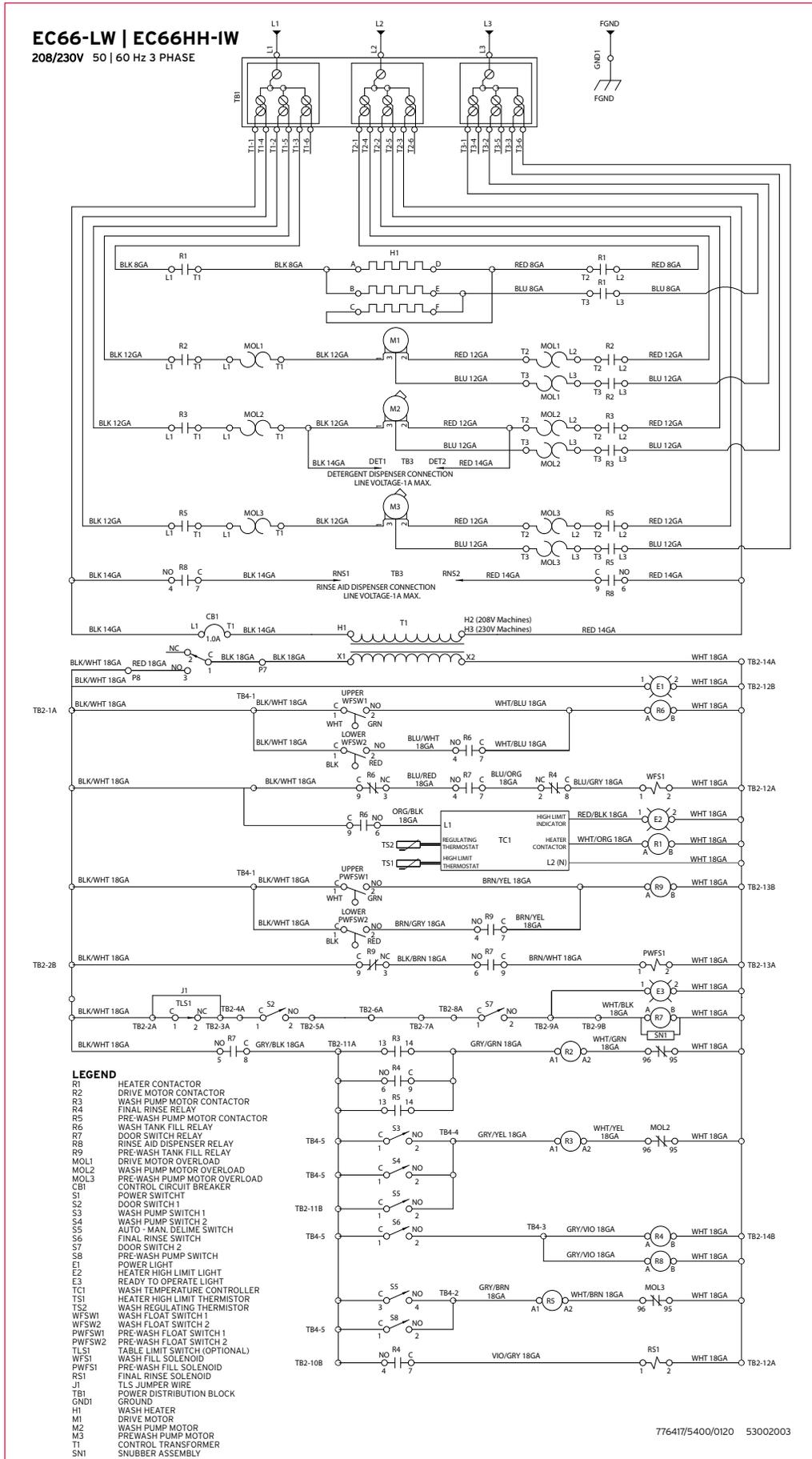
7.0 ELECTRICAL SCHEMATICS

EC44-LW | EC44HH-LW
460V 50 | 60 Hz 3 PHASE



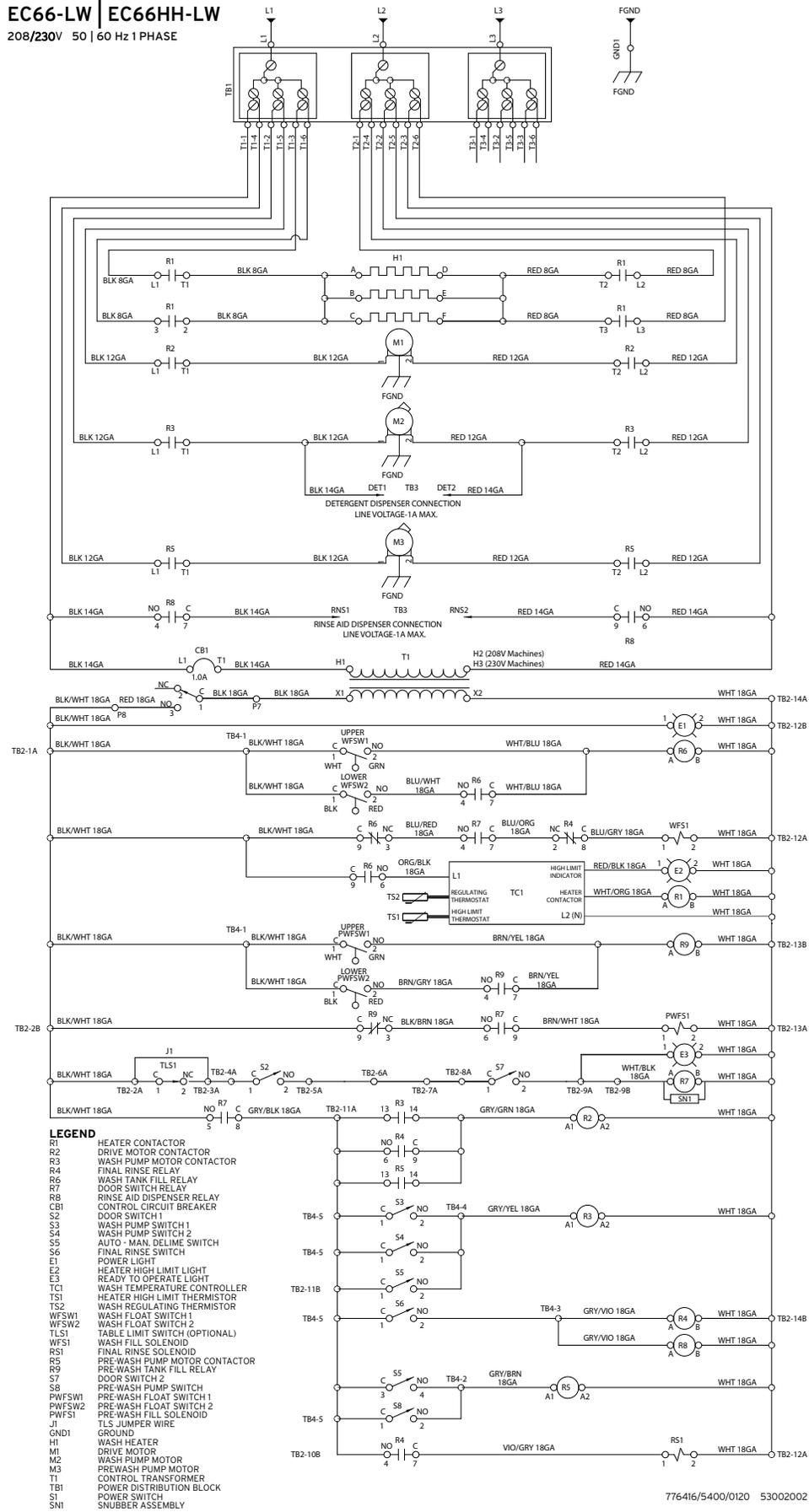
776415/5400/0120 53002001

7.0 ELECTRICAL SCHEMATICS



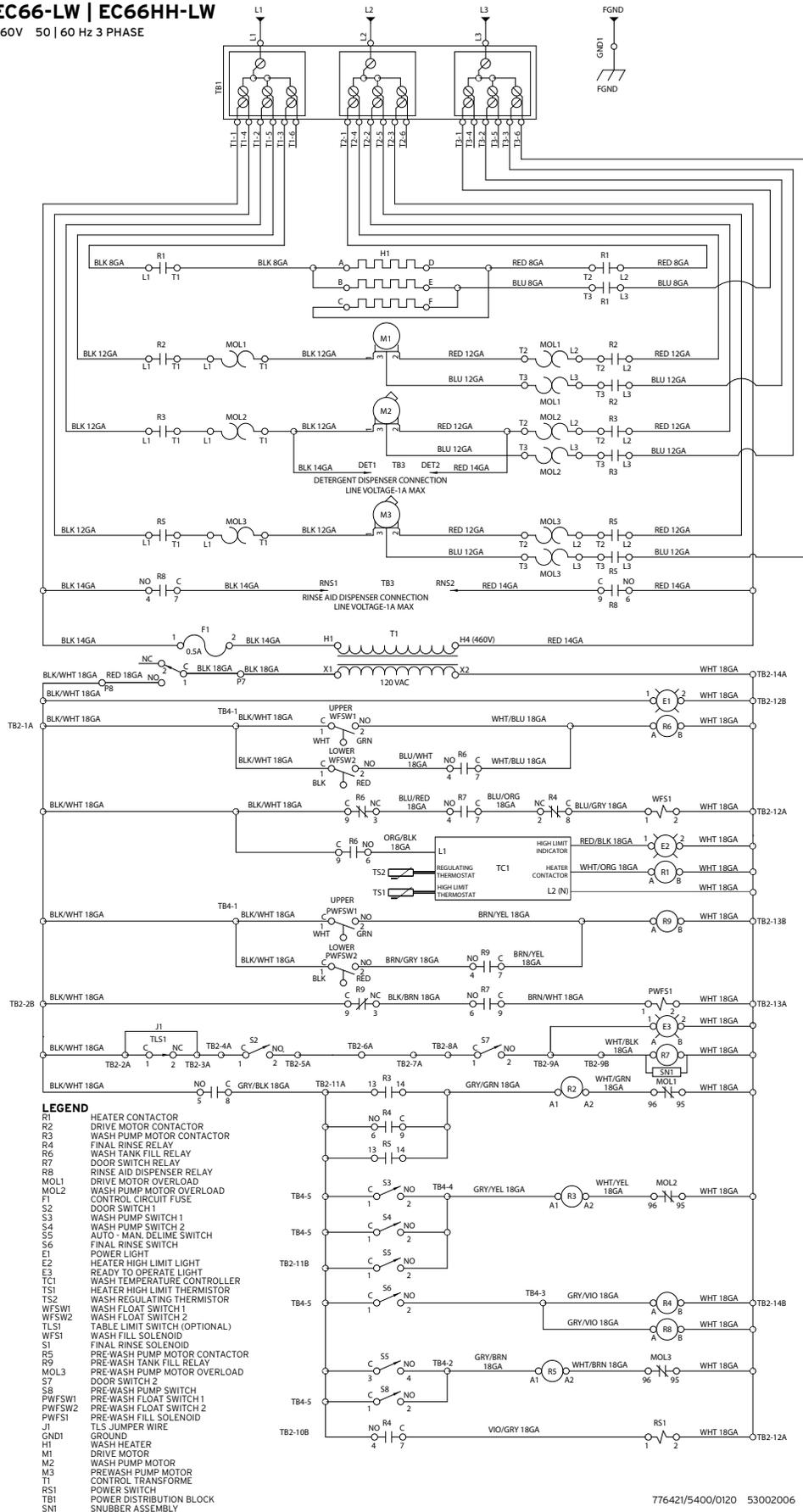
7.0 ELECTRICAL SCHEMATICS

EC66-LW | EC66HH-LW
208/230V 50 | 60 Hz 1 PHASE



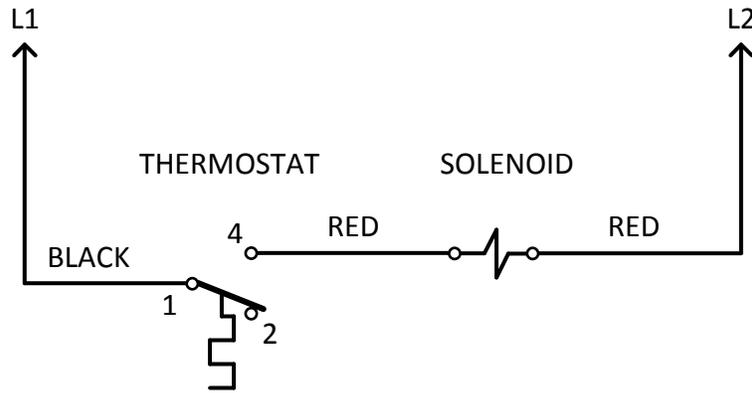
7.0 ELECTRICAL SCHEMATICS

EC66-LW | EC66HH-LW
460V 50 | 60 Hz 3 PHASE



7.0 ELECTRICAL SCHEMATICS

DRAIN QUENCH SYSTEM

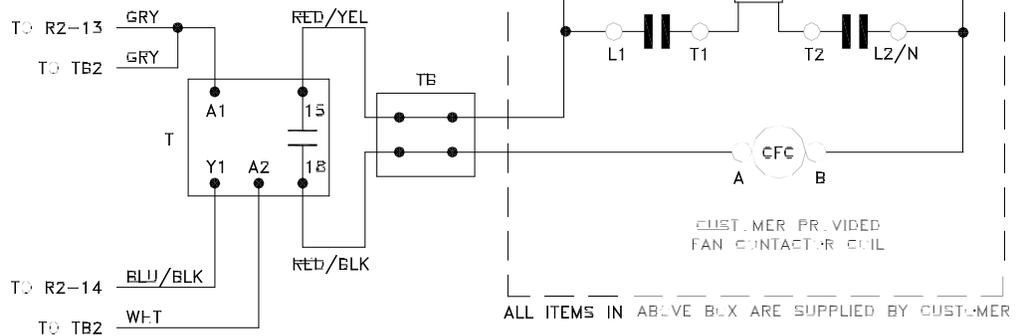


CONNECT BLACK WIRE TO MOTOR CONTACTOR – L1 WITH PIGGYBACK TERMINAL PROVIDED
 CONNECT WHITE WIRE TO MOTOR CONTACTOR – L2 WITH PIGGYBACK TERMINAL PROVIDED

CONVEYOR EXHAUST FAN HOOKUP

LEGEND

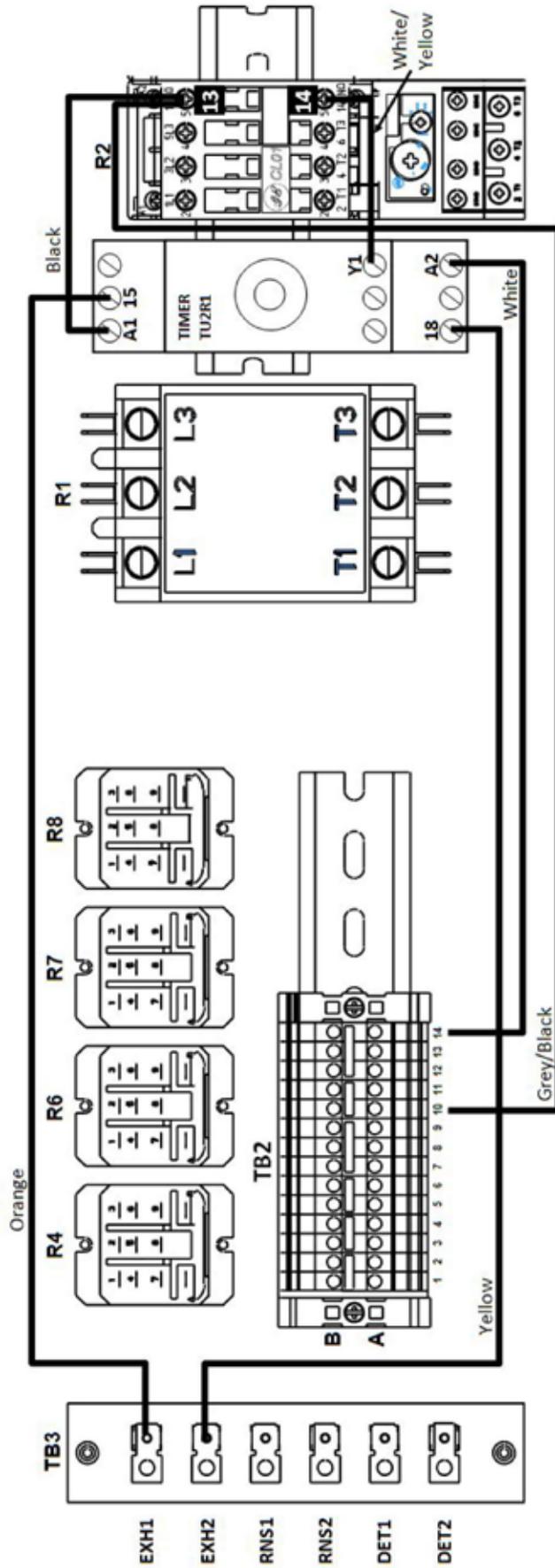
T TIMER
 TB TERMINAL BOARD



05-002-55-26C

7.0 ELECTRICAL SCHEMATICS

Exhaust Fan Timer Connection Diagram



1 Ecolab Place, St. Paul, MN 55102
www.ecolab.com

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55138/5400/0120
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