OPEN POCKET SOFT MOUNT NON-TILTING WASHER-EXTRACTORS

INSTALLATION, PROGRAMMING, AND OPERATION TECHNICAL MANUAL

CSL60

CSL110

CSL175

Technical specifications are based on the latest information availavle at the time of printing and are subject to change without notice.

The EDRO Corporation
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East Berlin, CT 06023 U.S.A.

www.edrocorp.com

Revision Date: June, 2014
Part No: MANC-1000

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NEW MACHINE WARRANTY

The EDRO Corporation, from here on known as the Seller, warrants all EDRO DynaWash® washer-extractors shipped by it to be free from defects in material and workmanship for a period of eighteen (18)months or two thousand two hundred (2,200) operating hours, whichever occurs first, from the date of shipment from the Seller's factory, provided: (a) they are used by the original buyer, (b) they are given normal and proper usage, (c) all electrical and mechanical connections are made in accordance with Seller's specifications, and (d) proper installation and start up procedures are employed by qualified personnel.

Consumable and normal wear items, such as control switches, regulators, solenoids, gaskets, glass, and plastic are not covered under this warranty. All labor charges incurred during any warranty period are the sole responsibility of the Buyer.

Notice of any warranty claim must be presented to the Seller immediately upon Buyer's discovery of the defect. The right of inspection must be given to the Seller while the product is in the claimed defective condition, and operation of the product must be suspended until written clearance is issued for continued operation.

Upon receipt of a warranty claim notice, the Seller will proceed without unreasonable delay to remedy any defect found to exist under the terms of warranty. During the warranty period, parts found to be defective after the Seller's inspection, will, at the Seller's option, be repaired or replaced with new or factory rebuilt parts free of charge, except that of freight charges, custom charges, or other associated fees involved with the returning of the defective component to the Seller, and shipment of the replacement component will be the responsibility of the Buyer.

Vendor Supplied Items : Vendor supplied items shall be warranted in accordance with the available warranty, if any, provided to the EDRO Corporation, by the vendor. Claims relating to vendor supplied items will be dealt with on a case-by-case basis.

Five (5) year pro-rated warranty on shell, cylinder and frame. For a period of five years, from the date of shipment, EDRO DynaWash® shells, cylinders and frames are guaranteed not to develop any structural fractures to the material due to workmanship.

There are no warranties which extend beyond the description and the warranties contained herein. The warranties expressed herein are in lieu of any other warranties, expressed or implied. Any implied warranty of merchantability and implied warranty of fitness for a particular purpose are hereby excluded. The Buyer's remedy is limited to, and the Seller's liability shall not exceed either, (1) repair or replacement of the defective part of the product or, at the Seller's option (2) return of the product and refund of the purchase price. Such remedy shall be the Buyer's entire and only remedy.

EDRO

Battleship Quality

FAILURE TO COMPLETE AND RETURN WARRANTY REGISTRATION FORM WILL NULLIFY WARRANTY

COMPANY HISTORY

The EDRO Corporation manufactures a complete range of industrial strength laundry washer-extractors sold under the brand name EDRO DynaWash®. Machines are sold and serviced by a worldwide network of independent equipment distributors. Since 1954, EDRO has developed sales in many laundry markets, but is best known as the world's leading supplier of Navy shipboard and marine laundry washer-extractors.

The EDRO Story. . .

In September, 1946, in New Britain, Connecticut, two Polish immigrants, Edward Pivcinski and Roman Galinski (hence the name Edro), opened a specialty tool and die shop to serve the local manufacturing market. At that time, Edro supplied high precision milling and turned parts to companies such as The Stanley Works, Kaman and Sikorsky Aircraft. The company was noted for its high quality craftsmanship and ability to manufacture custom machined parts.

In 1954, founder and then president Roman Galinski invented a unique design in washer-extractors for the laundry industry. His patented "3-D" triangular designed three pocket wash cylinder, which he called DynaWash®, eliminated the time consuming step of transferring water laden laundry from washer to separate extractor. And for the first time, large volumes of laundry were able to be processed in a combination washer-extractor. These machines improved the productivity of the wash room by increasing the efficiency of the labor usage and utility consumption; all the while, the rugged, durable design of the machine made it last for years.

The EDRO Corporation of TODAY marks a company with a broad range of experience in the manufacturing process and expertise in laundry equipment. From the original 300 lb. capacity three pocket DynaWash®, EDRO has developed a complete line of washer-extractors in both the Three Pocket and Open Pocket designs. With a variety of options including Pass-Thru designs for Clean Room applications, state-of-the-art DynaTrol touch screen HMI control, and high efficiency electric motor drives, the EDRO DynaWash® machines of today meet the demanding needs for higher productivity and energy conservation.

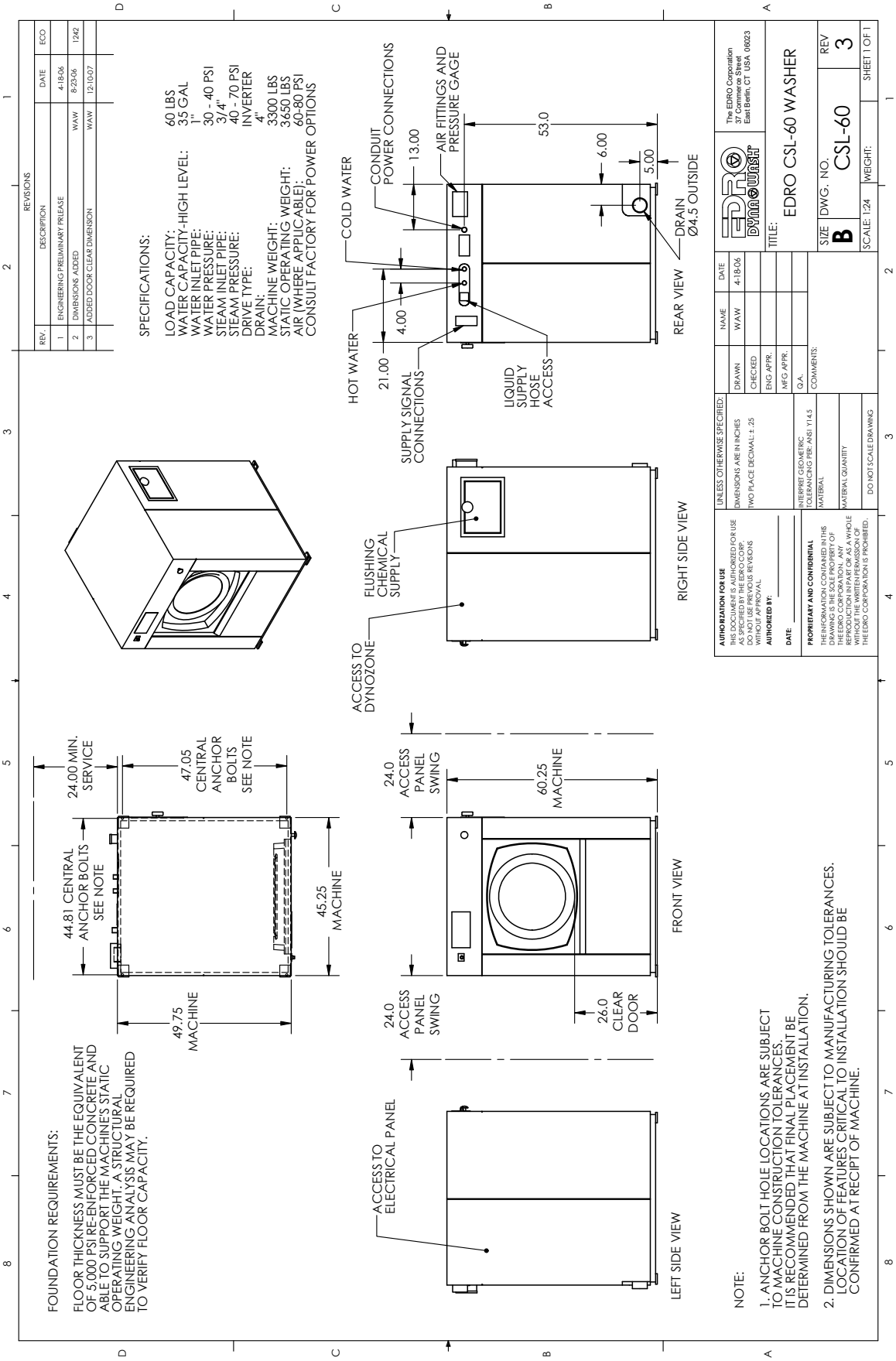
You will find EDRO DynaWash® laundry washer-extractors wherever there's a tough laundry job to get done. There are EDRO installations throughout the world in hospitals, hotels, nursing homes, commercial laundries, institutions and many others. EDRO is perhaps best recognized as the leading supplier of shipboard washer-extractors to the U.S. Navy. Over 400 ships fleet wide have rugged, reliable EDRO DynaWash® machines on board: from the 16 lb. capacity for submarines to the 200 lb. capacity for the high volume laundry operations aboard aircraft carriers. EDRO has been selected by Carnival Cruise Lines as the choice supplier for their fleet of ships, recently outfitting the laundry on the world's largest cruise ship.

All of us here at EDRO appreciate your confidence in selecting us for supplying you with our line of equipment. We are committed to serving you to make for a satisfying experience with EDRO.

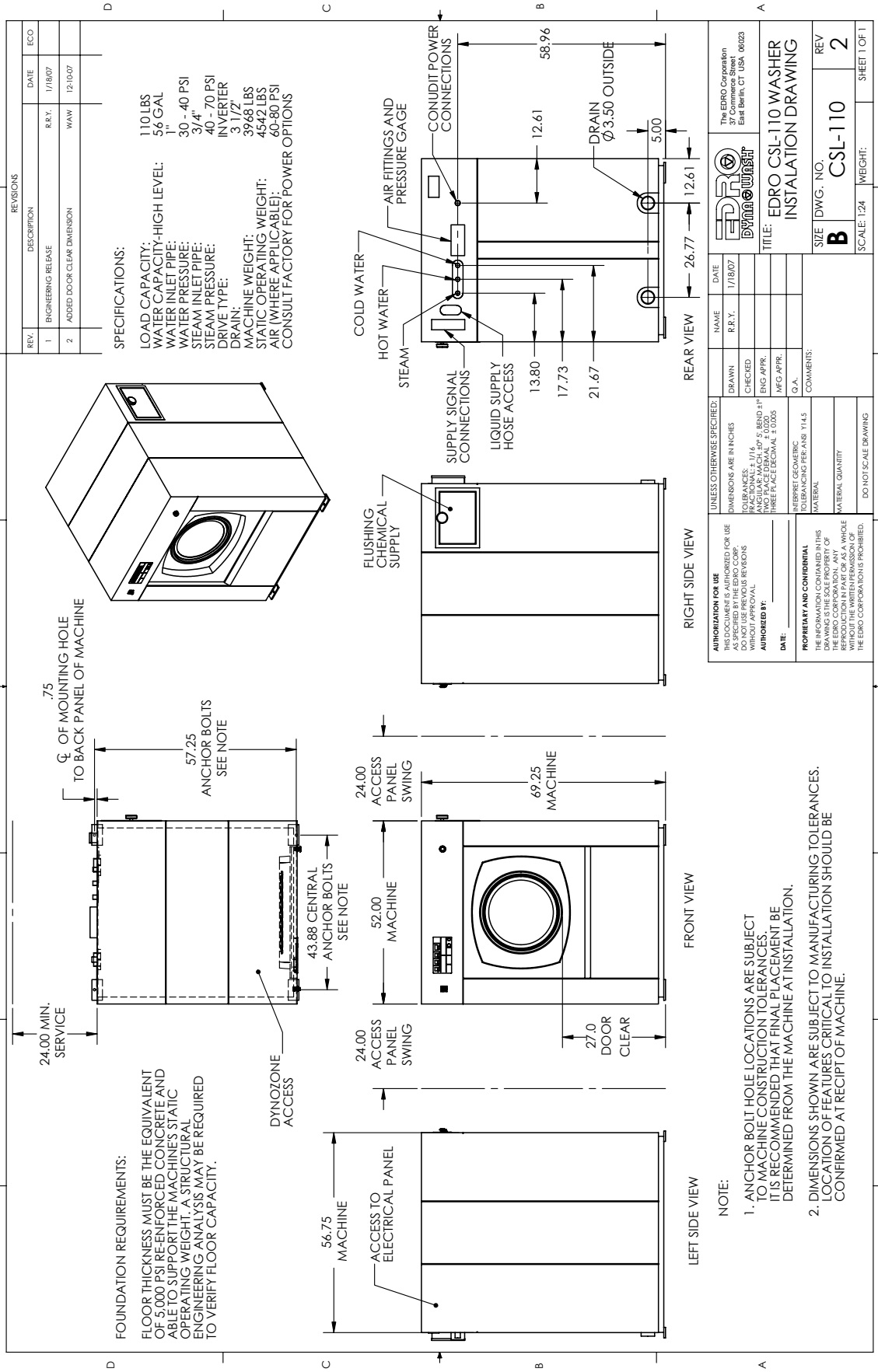
The EDRO Corporation

Manufacturer of DynaWash® washer-extractors equipped with DynOzone – DynaWash® Ozone System
Three Pocket 100 to 400 lb. capacity
Open Pocket 35 to 450 lb. capacity

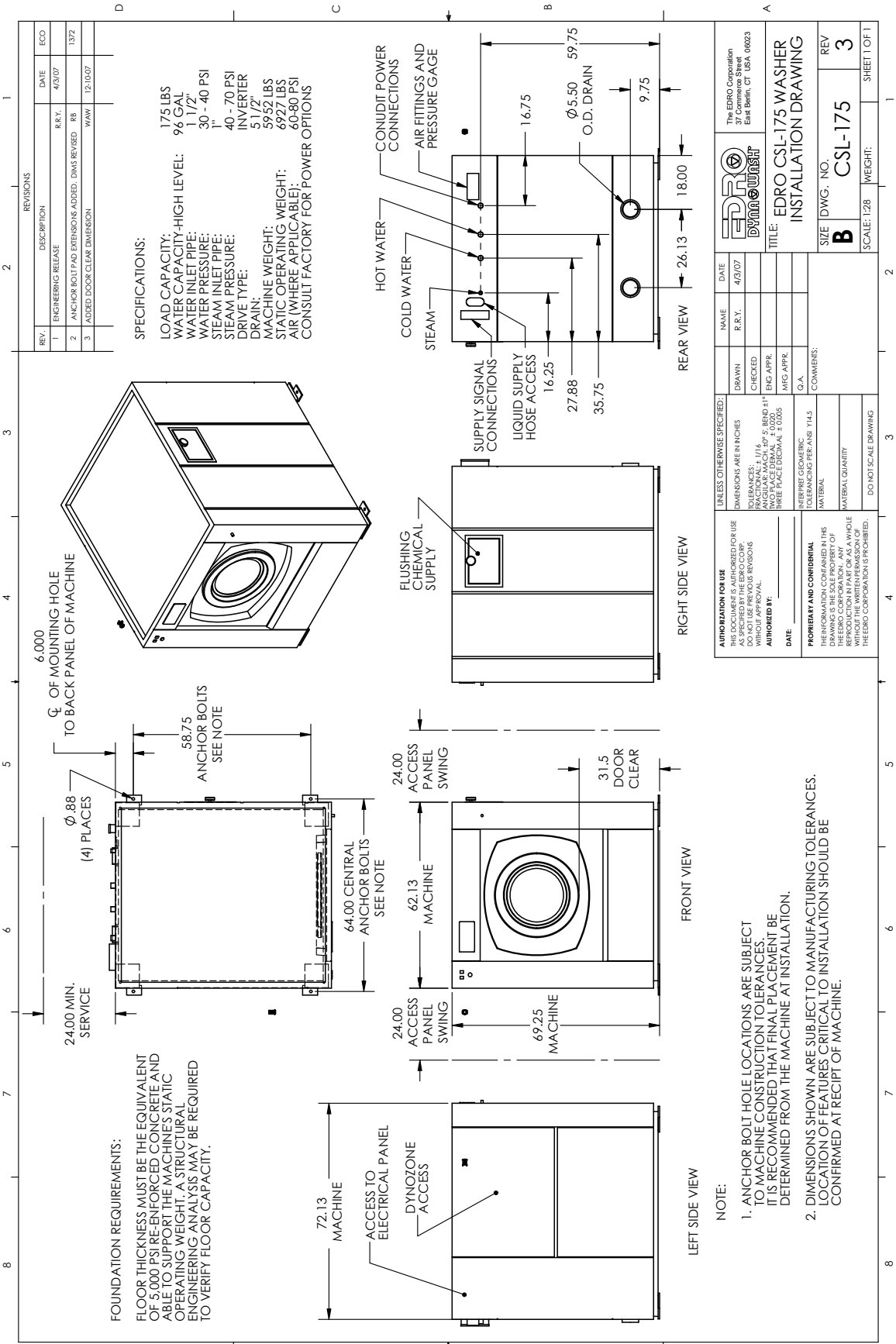
CSL60 Installation Data Drawing:



CSL110 Installation Data Drawing:



CSL175 Installation Data Drawing:



INTRODUCTION

This manual has been developed to assist in the proper start-up and maintenance of your EDRO DynaWash® CSL washer-extractor. Please read and understand the information in this manual to assure for safe use of the product. There are safety warnings which should be adhered to, drawings with part numbers which describe certain parts of the machine to aid in ordering replacement parts, and instructions to assist in the safe and proper installation and use of the equipment.

The number one concern when operating machinery as such is safety. The following warning appears in other areas of the text, and is repeated here for emphasis.

WARNING

Do not attempt entry into machine until the basket has come to a full and complete stop and the control signals end of program as personal injury may occur.

There are specific sections of this manual which require special attention to the end user of the product. We have highlighted these areas with the following icon:

This notation appears in both the text and drawings of the manual.

RECEIVING EQUIPMENT

Once your EDRO DynaWash® CSL washer-extractor has been delivered by the trucking company, inspect the machine for any visible damage, and record all transit damage on the freight company's bill of lading. If damage exists, contact the freight company, explain the problem, and ask for an on-site inspection. File all claims with the freight company before the damage has been repaired. All damaged parts must be replaced before installation to ensure safe and correct operation. CSL machines contain shipping brackets and braces for support and safe keeping of equipment during transit. Remove all brackets and bracing prior to operation. In most instances, these components are painted yellow.

IMPORTANT CONTACT INFORMATION

You can reach EDRO service technicians by any of the following methods:

Telephone: (860) 828-0311
Fax: (860) 828-5984
E-Mail: service@edrocorp.com

Technical support and spare parts service is available Monday through Friday from 8:00 am to 4:30 pm Eastern Standard Time. Keep on the lookout for our on-line technical service and support forum located on the Internet's World Wide Web. Our URL address is **http://www.edrocorp.com**.

Please note the machine's **Model Number** and **Serial Number** when contacting the factory for technical support and/or placing a spare parts order.

SAFETY SUMMARY

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of installation, operation and maintenance. While the information contained in this manual represents our best judgment, EDRO assumes no liability for its use.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position, due to charges retained in capacitors. To avoid casualties, always disconnect power, discharge and ground any circuit before touching it.

DO NOT SERVICE OR ADJUST ALONE

Under no circumstances should any person reach into or enter the enclosure for purpose of servicing or adjusting the equipment except in the presence of someone who is capable of rendering aid.

RESUSCITATION

Operation and maintenance of EDRO DynaWash® CSL washer-extractors involves some potential hazards. All operators and personnel should be alerted to possible hazards and precautions should be taken to prevent possible injury. Personnel working with or near high voltages should be familiar with modern methods of resuscitation.

GAS & FUMES

Chemicals in the use of washing may combine to produce dangerous and hazardous gases and fumes. Machine must be installed in an area with adequate ventilation.

ELECTRIC SHOCK

ELECTRIC SHOCK CAN KILL!

Install and maintain equipment according to National Electrical Code standards. Turn off all power prior to servicing machine.

CAUTION

WARNING: ELECTRICAL HAZARDS

ALWAYS DISCONNECT POWER SUPPLY
BEFORE REMOVING COVER OR SERVICING UNIT.

READ AND UNDERSTAND THIS ENTIRE MANUAL PRIOR TO INSTALLING, OPERATING OR SERVICING MACHINE.

TECHNICAL DATA & SERVICE CONNECTIONS

Model	CSL 60	CSL110	CSL175
Dry Weight Capacity	60 lb.	110 lb.	175 lb.
Cylinder Type	Open Pocket	Open Pocket	Open Pocket
Diameter	32 in.	39 in.	45 in.
Depth	20 in.	26 in.	32 in.
Cylinder Volume	9.3 ft.³	17.9 ft.³	29.4 ft.³
Door Opening	17 in. diameter	20-1/4 in. diameter	23 ½ in. diameter
Water Inlets (Hot & Cold)	1 in. NPT	1 in. NPT	1 ½ in. NPT
Steam Inlet (Direct)	3/4 in. NPT	3/4 in. NPT	1 in. NPT
Drain Pipe	4 in. pipe	4 in. pipe	5 ½ in. pipe
Circuit Breaker @ 220/3/60	30 amp	30 amp	50 amp
Frequency Drive	7.5 hp	10 hp	15 hp
Motor Type	single motor with inverter	single motor with inverter	single motor with inverter
Speeds	variable	variable	variable
G-Force @ high extract	up to 297	up to 310	up to 315
Net Weight	3,300 lb.	3,968 lb.	5,952 lb.
Width	45-1/4 in.	52 in.	62-1/8 in.
Depth	49-3/4 in.	56-3/4 in.	72-1/8 in.
Height	60-1/4 in.	67 in.	73-1/2 in.

All models are equipped with Variable Frequency Speed Drive (VFD), in which speeds are generated from a single motor. These are preset at the factory; however, all speeds can be re-programmed in the field through the DynaTrol touch screen control.

 Note:

- Main water shut off valves are not supplied with the unit.
- DynOzone Ozone System is installed on machine's internal framework and fully integrated with the control.
- Automatic Supply Injection is connected to the hot water inlet.

INSTALLATION

The installation procedure of your EDRO DynaWash® washer-extractor is simple and should not take more than one day to complete. Except for reconnecting certain parts disconnected for safety in shipping, no internal assembly or wiring is necessary. By reading these instructions carefully and following suggested procedures, you will not only save time, but will avoid many unnecessary complications and future corrections.

FOUNDATION

It is necessary to provide a proper foundation for EDRO DynaWash® Open Pocket Soft Mount Washer-Extractors. Anchor the base of the machine to the floor in accordance with factory recommendations (refer to the Installation Data Drawing in the forward of this manual). For installations on upper floors, check with a structural engineer to verify the capability of the floor to support the machine's static weight once in operation.

 Note:

- MACHINE MUST BE INSTALLED ON A **LEVEL FLOOR** (OF THE MINIMUM SPECIFICATIONS OUTLINED).

INSTALLATION

When installing, make certain the foundation area is clear of any obstructions. Using the shipping holes as guides, bolt the base plates to the floor. Then, grout the base plates to form a continuous bond between the base and floor.

 Note:

- When grouting, level the machine's base front to back and left to right. Grout base using commercial grade quick dry grout. Tighten bolts after grout has fully cured.

SUSPENSION SYSTEM

It is very important to understand that proper leveling of the machine will result in optimum performance.

 Note:

- Remove the shipping brackets located at the bottom of the springs.
  DO NOT OPERATE MACHINE WITH SHIPPING BRACKETS IN PLACE.
- MACHINE MUST BE ADJUSTED LEVEL BOTH FRONT TO BACK AND LEFT TO RIGHT.

SERVICE CONNECTIONS

Plumbing

1. The hot water inlet feeds the Automatic Supply Injection system. A regulating valve allows for adjustment of the water flow provided to the supply valves.
2. All DynaWash® machines feature a built-in air vent that prevents the tub from pressurizing, however, backflow prevention should be considered when installing the main plumbing to the machines as per site requirements. All models are equipped with general purpose water valves and it is recommended suitable “air cushions” be installed in the supply line to prevent “water hammering”.
3. All machines are equipped with a steam valve. Pipe the steam line directly to the machine with a regulator cut off valve. The machine is equipped with a solenoid valve and diffuser to automatically inject live steam into the machine during predetermined cycle times.
4. The drain valves are located on the back frame of the machine. When connecting to sewer, allow for breather pipe to prevent slow drain. Refer to Installation Data Drawing for exact drain locations.
5. The machine requires a ¼“ NPT compressed air connection. Included on machine is an air filter, pressure regulator, and lubricator (FRL). A minimum pressure of 40 PSI is required to operate the machine. Install a separate shut off valve on the air line (not included).

Electrical

You will note that our Technical Data & Service Connections lists the recommended circuit breaker and wire sizes for each machine model. DO NOT USE FUSES. Machine must be connected and grounded in accordance with the National Electric Code and/or local requirements. To install main power, run a cable from the disconnect box to the bottom left corner at the back side of the machine, and attach the wires to the main breaker terminals marked L1, L2 and L3.

 Note:

- Verify that the voltage selected on transformer T1 matches the site’s line voltage!

All service connections should be made by qualified personnel.

INSPECTION AND MAINTENANCE RECORD

Serial No. _____ Machine Model No. _____

Name _____ Date of Installation _____

Address _____ Telephone _____

Distributor _____

INITIAL INSPECTION

INSTALLATION:
__ Level Floor
__ Bolt Down Base
__ Grout Base
__ Water Inlets (H & C)
__ Drain
__ Electrical Connection
__ Compressed Air
__ Steam

MECHANICAL:
__ Anchor Bolts
__ Level Machine
__ Belts & Pulleys
__ Bearing Set Screws
__ Door Lock Mechanism
__ Vibration Switches

OPERATIONAL:
__ Drain
__ Base Bolts & Grouting
__ Suspension System
__ Water Inlets (H & C)
__ DynOzone System
__ Steam
__ DynaTrol Control
__ Motor Rotation
__ Temperature Control
__ Emergency Stop
__ Door & Tilt Functions
__ Vibration Switch
__ Flush & Degrease
__ Instruction Book

Note any damage:

Note corrections or replacements:

PERIODIC CHECK-UP:

Check and Adjust:

	One Week	One Month	Six Months	One Year
	Date: Initial:	Date: Initial:	Date: Initial:	Date: Initial:
Anchor Bolts	☐	☐	☐	☐
Suspension	☐	☐	☐	☐
Pulleys	☐	☐	☐	☐
Bushings	☐	☐	☐	☐
Belt Tension	☐	☐	☐	☐
Bearing Bolts	☐	☐	☐	☐

1. Grease bearing monthly. Apply four to five (4 – 5) strokes. It is recommended to use Keystone 88X, Lubriplate 630AA or equivalent heat and water resistant grade #2 grease.

SAFETY FEATURES

Door Lock: In the wash cycle, the machine will not start if the door is open; during operation, the door is locked and cannot be opened until the cylinder comes to a complete stop, control signals Program Complete and control is on door activation screen.

Steam Injection: The machine will not begin heating until water reaches the safety level. The control will not start to time out a step until the set temperature has been reached.

CAUTION

HOT SURFACES DO NOT TOUCH !
Use of steam injection or hot water
will cause machine surfaces to heat up.

Vibration Switches: The machine's vibration switches stop the machine in the event of excessive vibration. The switches automatically resets themselves and the machine retries three (3) times before signaling the operator of machine error.

For proper operation of vibration switch, machine must be level.

Automatic Supply Injection:

- Liquid/Dry Supplies. Check the water pressure on the automatic supply injection system and adjust the pressure to fill and flush a container within 10-15 seconds. Do not allow water to splash excessively. Personally injury and damage to machine may occur.
- Liquid Supplies. If your machine is attached to an external supply system, interface the terminal block with the central supply pump. This is a standard feature on all CSL machines. Refer to the DynaTrol control for additional programming and features in external chemical injection.

 Note:

- Reference the DynaTrol Touch Screen Control manual section for additional machine and control safety features.

WARNING

Do not attempt entry into machine until the basket has come to a full and complete stop and the control signals Program Complete as personal injury may occur.

WARNING

Do not install machine in areas where the ambient temperature is in excess of 115ºF.

START-UP PROCEDURES

Once the machine is set in place and service connections completed, proceed with checking out installation and operating functions, making necessary corrections and adjustments. Use the Inspection and Maintenance Record as a guide and permanent record. Following are a few hints that will make testing simpler, safer, and more thorough.

- Make sure the machine is properly installed, that the cylinder is empty and all shipping braces are removed.
- Turn on main power (from disconnect) to the machine
- Turn on the breaker inside the electrical panel box
- Turn on the DynaTrol control power button
- Reference the DynaTrol section of this manual
- Check and adjust water levels and temperature control through configuration of control.
- Run the machine through its test program (number 50).

 Note:

- Before washing the first load, thoroughly clean and flush the machine using hot water, soap, and alkali. Place a few rags into the machine. Rinse with clean water.

BEFORE OPERATION

Even though your EDRO DynaWash® CSL series washer-extractor is equipped with many safety features and interlocking controls which prevent the machine from being operated improperly, it is advisable to check the condition of the machine before engaging the main switch.

1. Make sure that the control power switch is in the OFF position.
2. After turning ON the electricity, see that the controls boots properly and the PLC responds normally.

If these instructions are observed, before the machine is started, there should be no unexpected trouble or any possible damage.

LOADING

Best results are obtained when the load is kept within +/- 10% of the machine's full rated capacity. Do not mix loads. Use the same type of washable material for each load (towels only, sheets only, etc.). The machines are rated to handle between 5 and 7 lb. per cubic foot capacity. This is determined by the composition of the material being laundered.

To load, turn on Control Power. Press Wash Programs button from home screen, then press the DOOR function key. The Autoswing door and tilting functions screen will appear. Follow instructions on the screen to open door and tilt washer. Load machine with laundry to rated capacity. Return Door switch to close position and press Program Select button. Add detergent to supply hopper as required. Select appropriate program and press Load Program to go to start screen. Verify correct wash program and press START to begin cycle.

UNLOADING

When control displays Program Complete and buzzer sounds, press DOOR to go to the Autoswing door and tilting functions screen. Follow instructions on the screen to open door and tilt washer. Unload machine.

AUTOMATIC OPERATION

Except for loading and unloading, all other operations of your EDRO DynaWash® machine are performed automatically according to the programmed wash program. Many other secondary or supplementary operations are controlled by the machine's electronic system such as locking the door, reversing the motor rotation, etc.

MANUAL OVERRIDE

Supervisors have the option to override the wash steps of a program. Press the override button on the wash screen and enter the appropriate password. Separate buttons on the control screen allow the supervisor to pause and stop a wash program, add hot or cold water, introduce steam and/or ozone, change the water level and temperature settings, and advance or retrieve steps. Refer to the DynaTrol Touch Screen Control section of this manual for more information.

USEFUL HINTS AND PRECAUTIONS

Following are some useful operation tips and precautions:

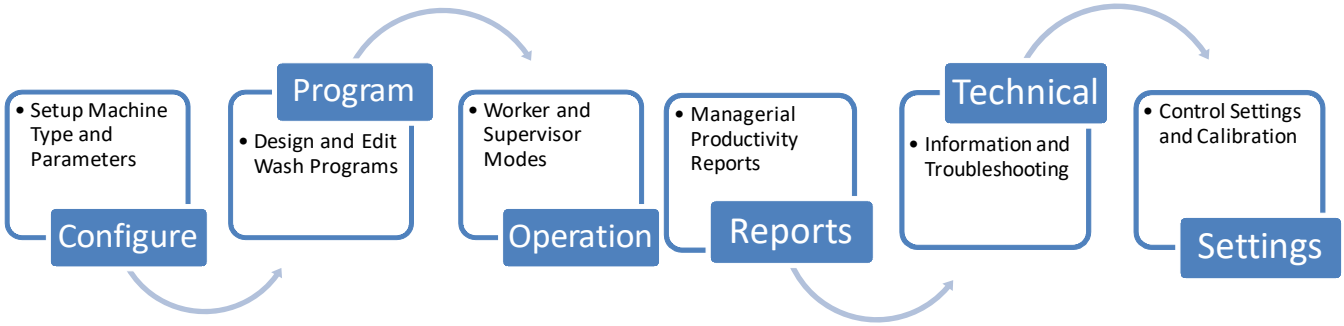
1. Make sure all utility connections to the machine are properly installed and operating.
2. Watch for any unusual or suspicious noises or other signs of improper functioning (over heated motors, slowing down of normal speed) before any serious trouble develops.
3. The machine will not operate when the door is not properly closed.

 Note:

- This machine must be installed, adjusted and serviced by qualified electrical and mechanical personnel familiar with the construction and operation of this type of machinery. If installed im properly, personal injury or equipment damage may result, jeopardizing validation of warranty.

DYNATROL TOUCH SCREEN CONTROL VERSION 2.0

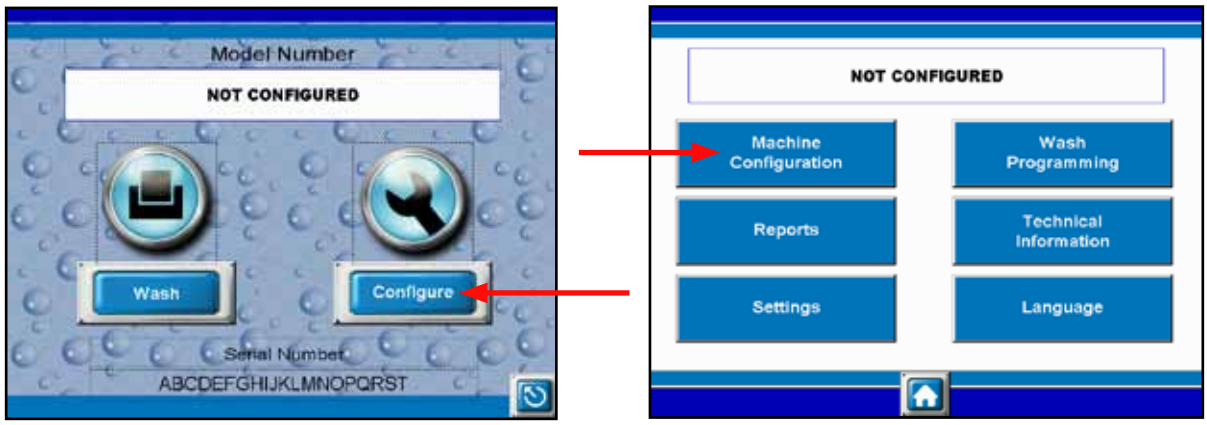
The DynaTrol touch screen control features the latest HMI (Human Machine Interface) control technology. It is based on a Programmable Logic Controller using ladder logic code. Select a link from the table of contents below to continue or browse with the navigation keys.



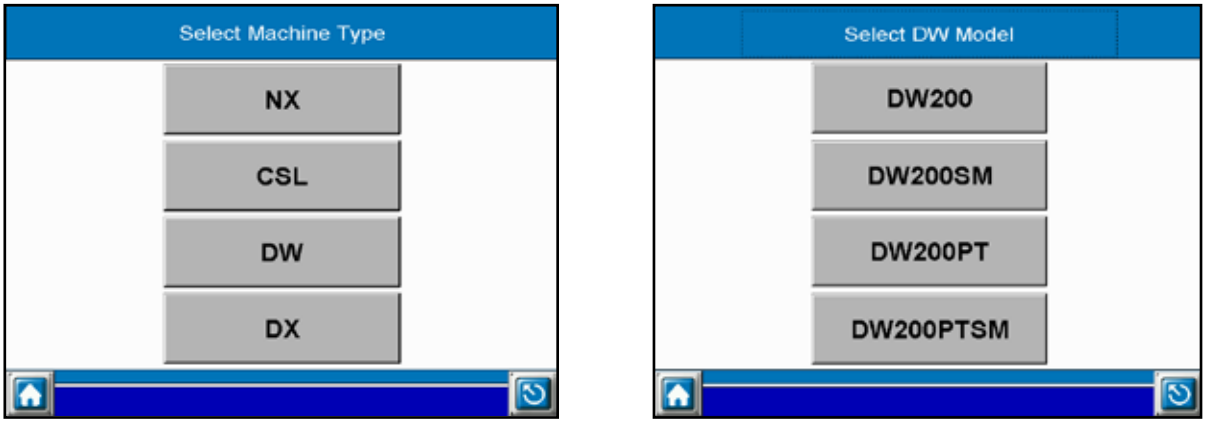
The DynaTrol touch screen control can be setup to work on any DynaWash® washer-extractor. It must be properly configured to take full advantage of its capabilities.

MACHINE CONFIGURATION

To enter Machine Configuration, press the Configure button from the Home screen, then select Machine Configuration. You will need a Level 3 password to continue.



Once you have entered Machine Configuration, you will need to select a machine type and a machine model to properly configure background control functions:



The next screens contain information on specific machine parameters which provide unique model characteristics. They are broken down into the following sub sections:

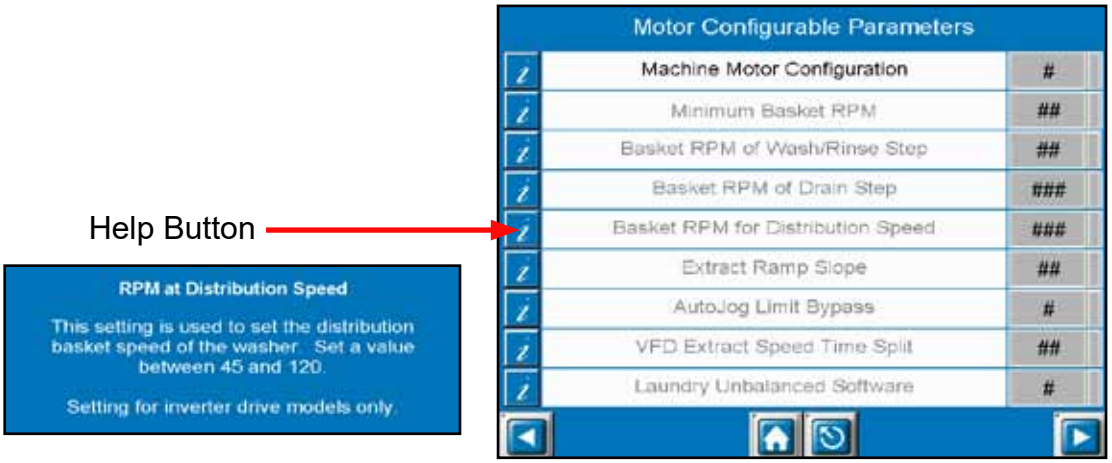
- Motor Setup
- Water Level Setup
- Ozone / Signal Setup
- Timers Setup
- Miscellaneous Configurable Parameters

NOTE
A help button is located next to each parameter which further describes the necessary input or provides a means to set the value.

Enter or change a value by pressing the corresponding number box on the right side of the screen. A popup window will appear with the current parameter value. Enter a new value and press ENT to accept, CLR to clear and the X to return without saving.

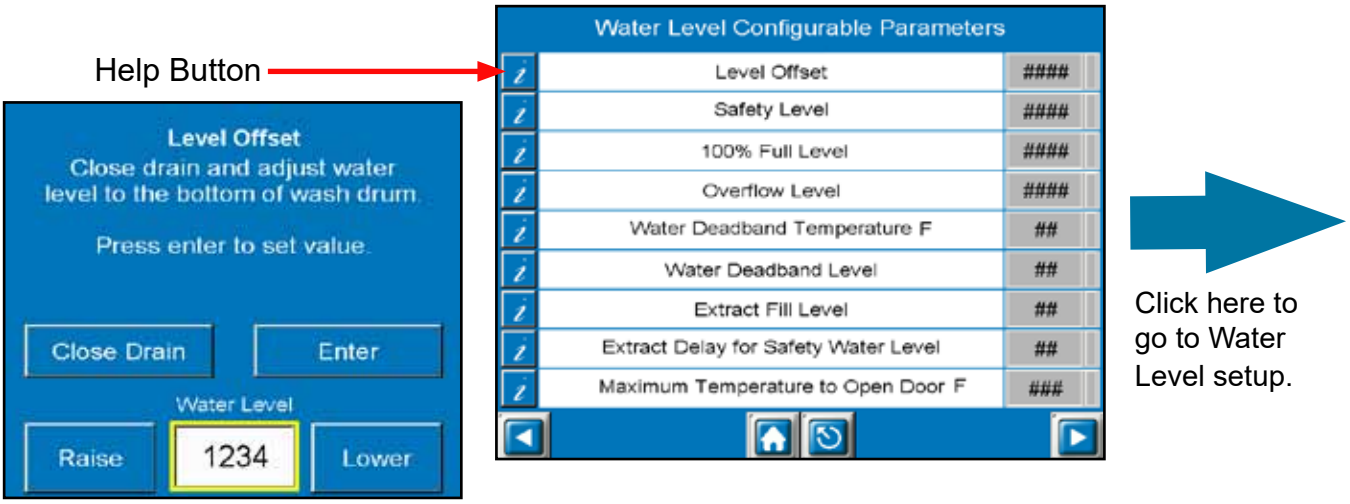
MOTOR SETUP

Configures motor design and speed settings for the machine.



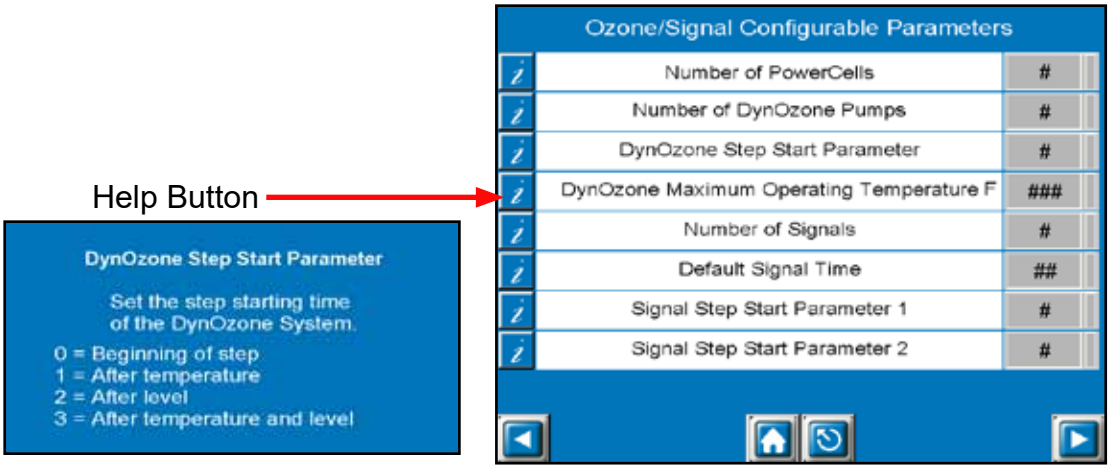
WATER LEVEL SETUP

Configures values which are affected by level sensing.



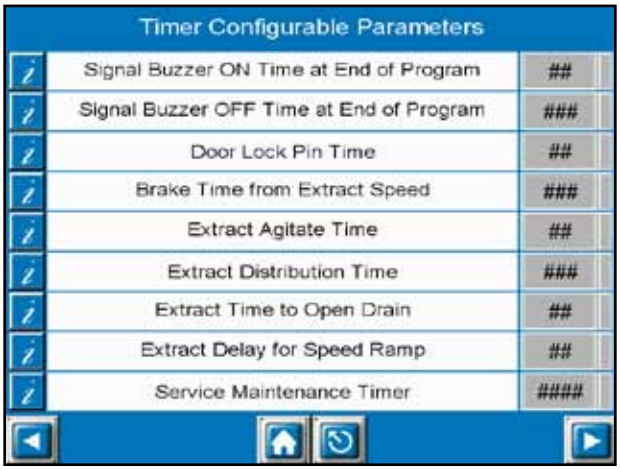
OZONE/SIGNAL SETUP

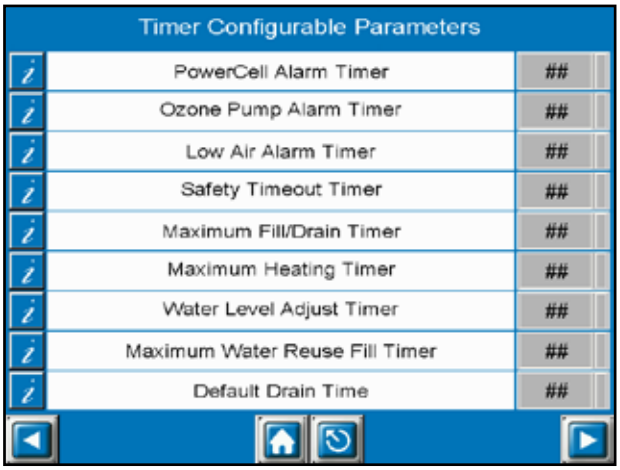
Configures DynOzone system and Signals working parameters.



TIMERS SETUP

Configures values which are affected by timers.

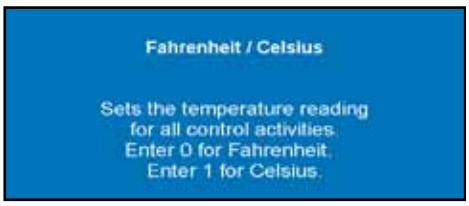


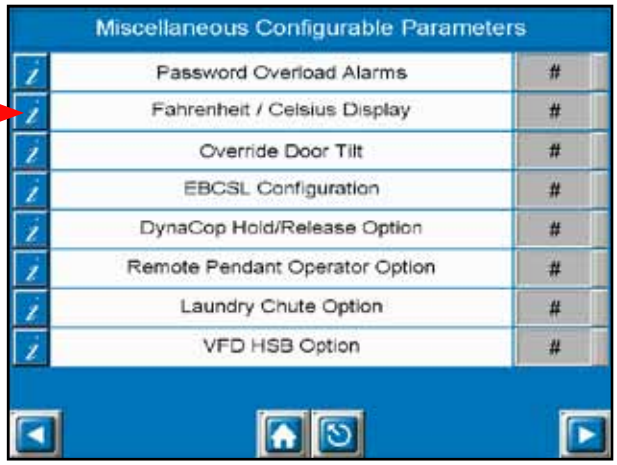


MISCELLANEOUS CONFIGURABLE PARAMETERS

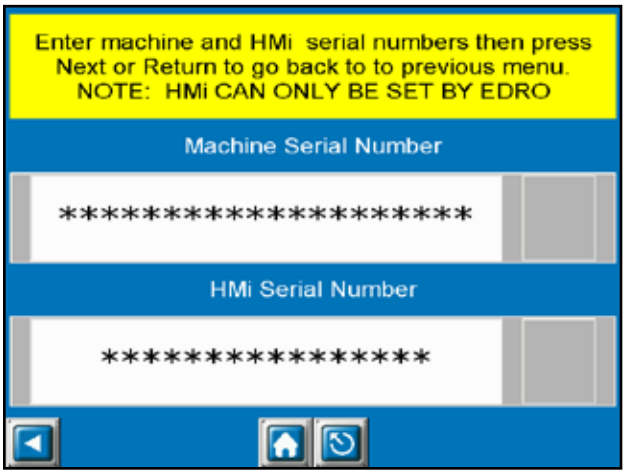
Configures miscellaneous parameters.

Help Button →



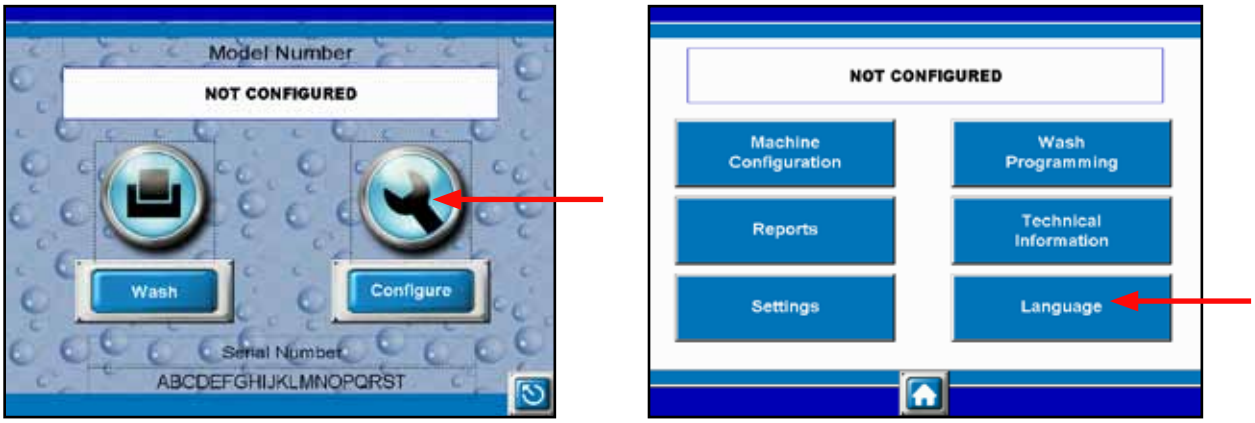


Machines can be reloaded with factory default settings by going through the Settings → Factory Process.



LANGUAGE SETUP

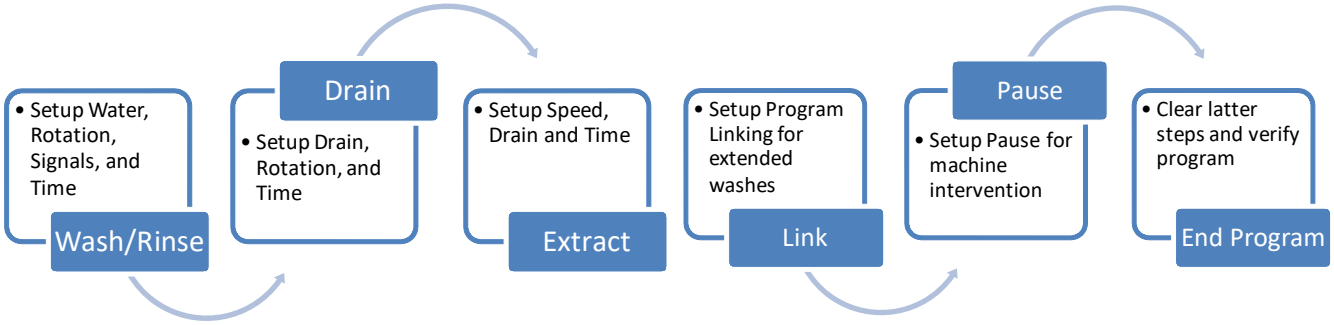
To choose Language, press the Configuration button from the Home screen, then select the Language button. A level 3 password is required to enter.



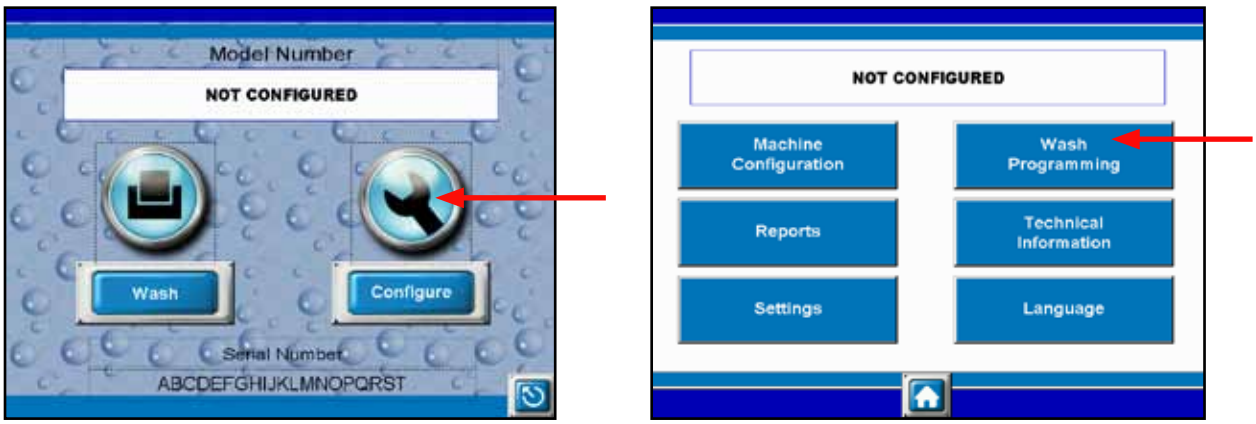
Select an available language. This will change all screens except technical information screens to the selected language. Technical information screens are by default English.

PROGRAMMING

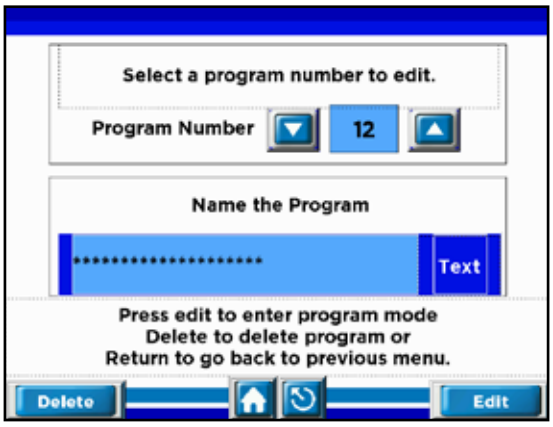
The DynaTrol touch screen allows for the entry of up to 50 wash programs with 25 steps per program, as well as the ability to link programs. Wash programs may contain any of the following steps:

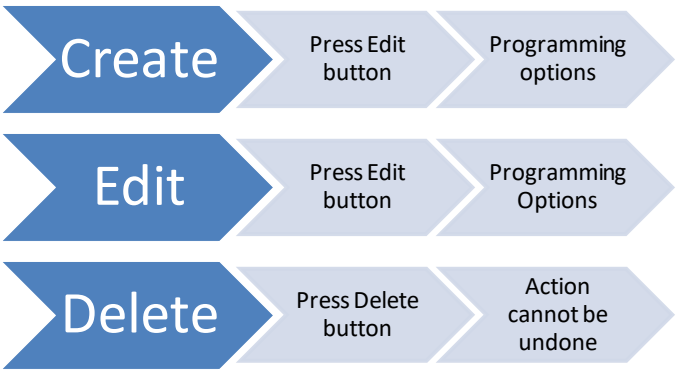


To enter Wash Programming, press the Configuration button from the Home screen. Then select the Wash Programming button. A Level 2 password is required to enter.



Begin by selecting a wash program number. Use the up / down arrows buttons to scroll. Program Names appear in the text box. Twenty-one factory programs are preloaded. These may be edited, deleted or re-loaded. To edit name, press the text box.

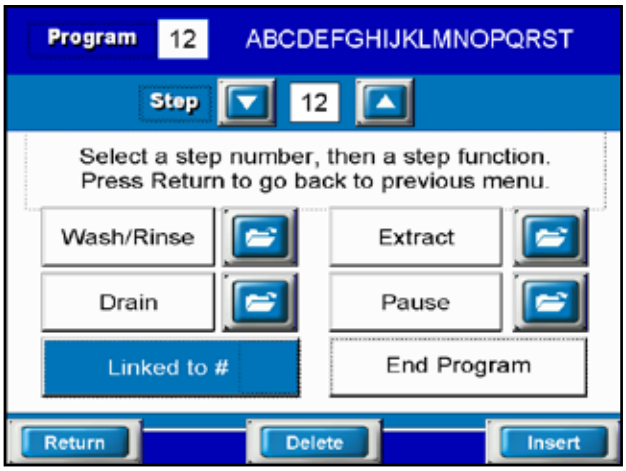




From this screen you can create a program, select a program to edit, delete a program, change program name, return to previous menu or return to home screen.

The main wash programming screen contains six operations:

- Wash / Rinse
- Extract
- Drain
- Pause
- Link Program
- End Program



Press the blue open button next to the operation you wish to perform. A blue operation box indicates the current step function. From this screen you can press the return button which will load a program summary screen, delete button which will delete the current step, or insert button which will insert a step. Press the blue operation box to edit the functions of that operation.

WASH/RINSE STEP

A Wash / Rinse step may contain the following operations:
• Water fill • Temperature control • Rotation control • DynOzone control • Signal control
A time must be entered for any wash/rinse step.

WATER FILL

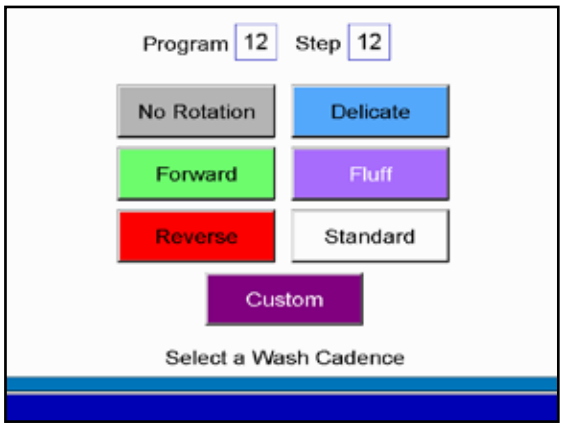
Press Cold to activate cold valve; Hot for hot valve, and Reuse for optional reuse valve. Water fills can be programmed to level and temperature with level being the determining completion factor.

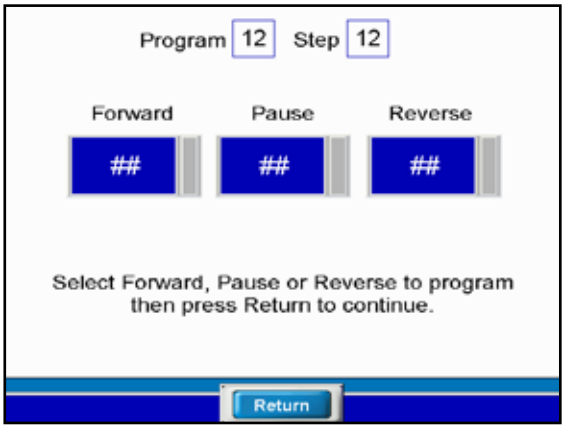
TEMPERATURE CONTROL

Programming a temperature and the Heat button will activate the heating device. This setting will be maintained for the duration of the step.

ROTATION CONTROL

The step programmable wash cadence is set to a default standard wash rotation. By pressing the Rotation button a screen with six options will appear. The setting is step local. Available selections include: Standard Wash; Delicate Wash; Fluff; Forward Only; Reverse Only; No Rotation. When selecting Custom rotation a new screen will popup with the last loaded rotation settings which can then be accepted or modified.





DYNOZONE CONTROL

Selecting the Ozone button will activate the DynOzone system during the wash step. System will start based on the configured step start parameters and continue for the duration of step.

SIGNAL CONTROL

Up to 10 signal outputs (depending on model) may be programmed per step. A popup screen allows for global naming of the signal as well as time entry. A signal time cannot exceed step time. Signals can be configured to inject on a per step or global basis. See Ozone/Signal Setup Configuration for options.

DRAIN STEP

A Drain step may contain the following operations: • Sewer Drain • Reuse Drain (option) • Rotation control. A time may be entered for a drain step.

DRAIN CONTROL

Select either sewer drain or reuse Drain (option).

LEVEL CONTROL

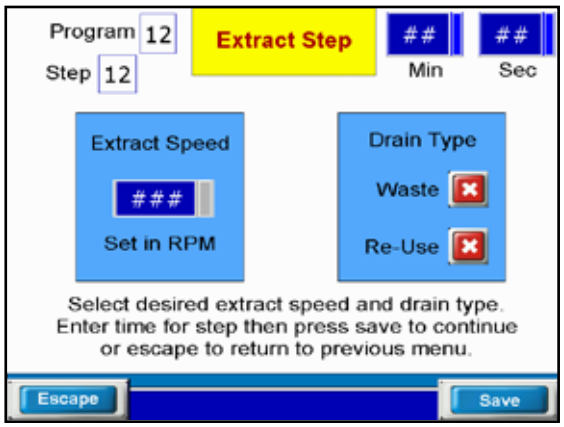
Program a time and select level or select a water level without time to drain to a set point.

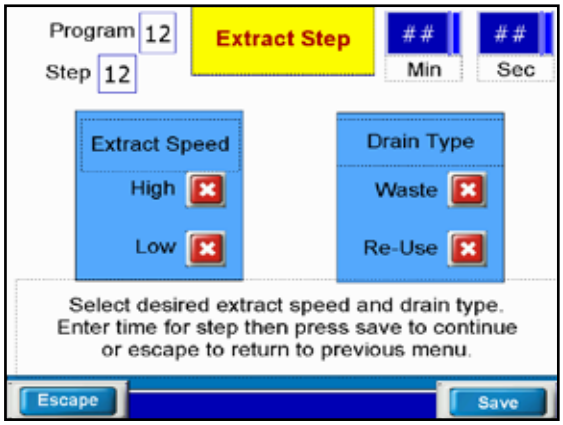
ROTATION CONTROL

Forward rotation or still.

EXTRACT STEP

An Extract step may contain the following operations: • Speed selection • Sewer Drain • Reuse Drain (option). A time must be entered for an extract step.





SPEED SELECTION

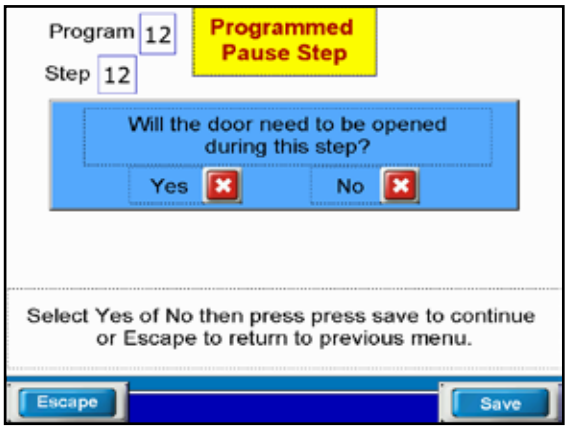
Depending on motor configuration, select a speed for extraction.

DRAIN CONTROL

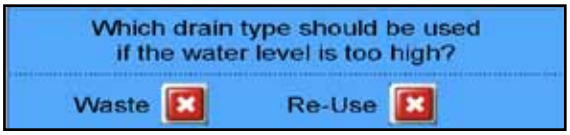
Select either sewer drain or reuse Drain (option).

PAUSE STEP

A Pause step may contain the following operations: • Pause • Door Open • Sewer Drain • Reuse Drain (option)



If door open is selected, a drain must be selected to attain door open safety level.



LINK PROGRAM

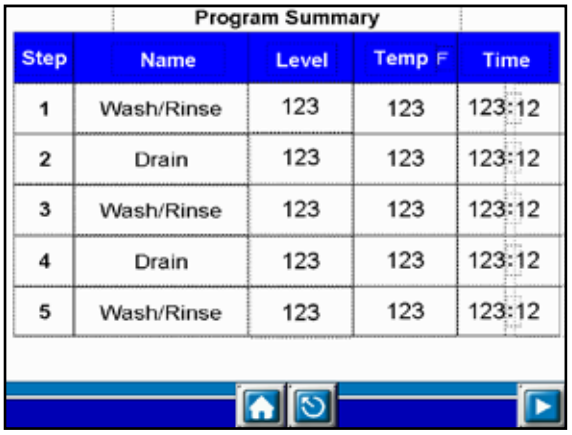
Pressing the Link Program button create a program link to any program in memory.

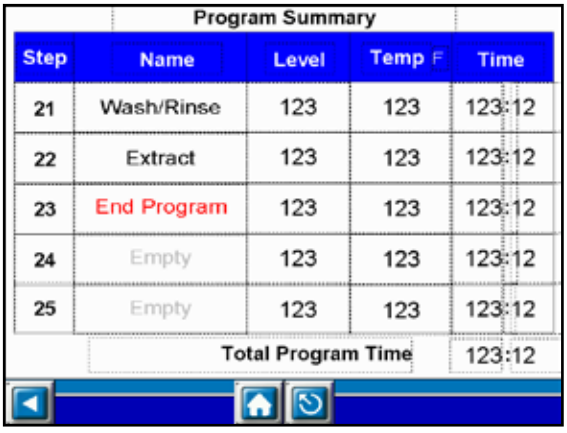
END PROGRAM

Pressing the End Program button will delete all latter steps of the program.

PROGRAM SUMMARY

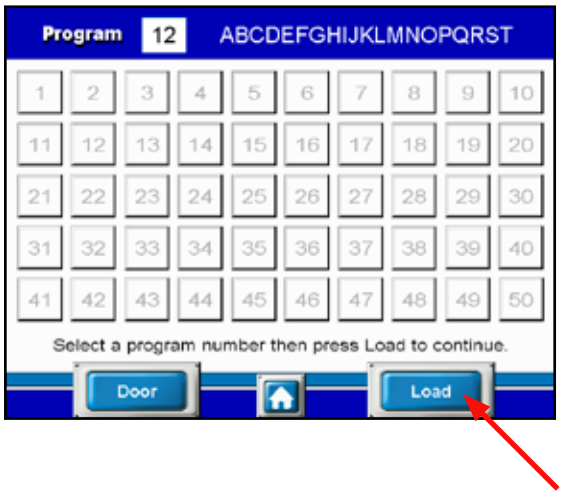
When the Return button is pressed from the main wash programming screen, a program summary will appear detailing all programmed steps. Press the forward and reverse arrows to scroll through all 25 steps or Home or Return buttons to return to Configuration menu or programming screen.



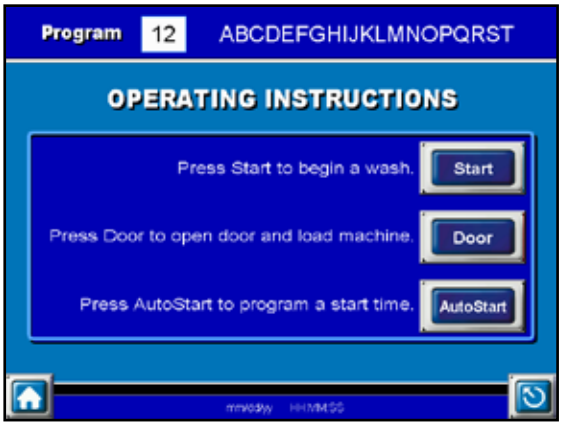


OPERATION

To begin wash operation, select the Wash Programs button from the home screen. This will load the available wash program screen. An available wash program is one that has already been programmed. Corresponding numbers and program names will appear in the text box when selected. On this screen, the function key Door is active to allow opening of the door for loading machine.



Press the Door button to activate door functions, home button to return to home screen, or Load button to go to Start screen. Select the appropriate operation.

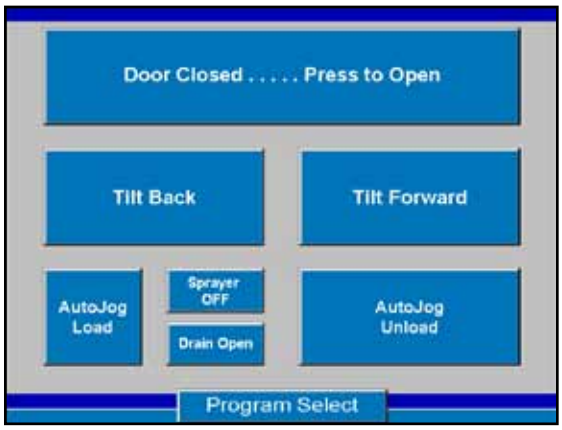


- START begins program operation.
- DOOR activates door lock screen.
- AUTOSTART allows for starting the machine at a time in the future.
    - A popup screen contains date, time and activation key.

CSL tilting models and DW_PT, *PassThru* models have additional control screens for the tilting, jog and Clean/Soil side controls machine functions.

PassThru models Door Screen

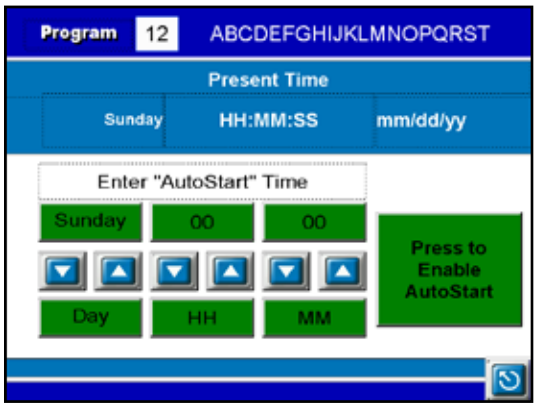
CSL Tilting models Door Screen



Non-Tilting Door Screen

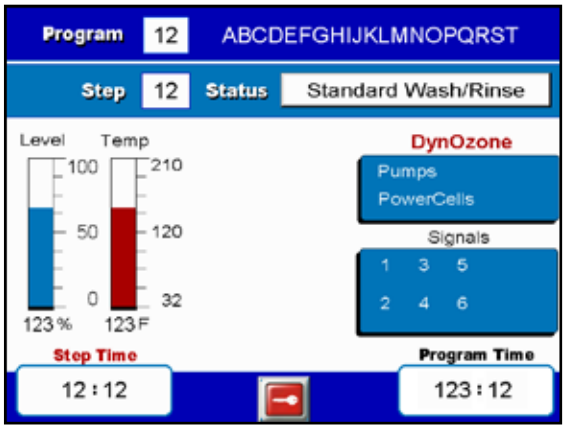
AUTOSTART

The header includes current loaded program and program name. The body contains present system time and settings for AutoStart time. Select a day, hour and minute to program and press ENABLE to activate. Pressing Return button will deactivate AutoStart and go back to Start screen.



WASH SCREEN

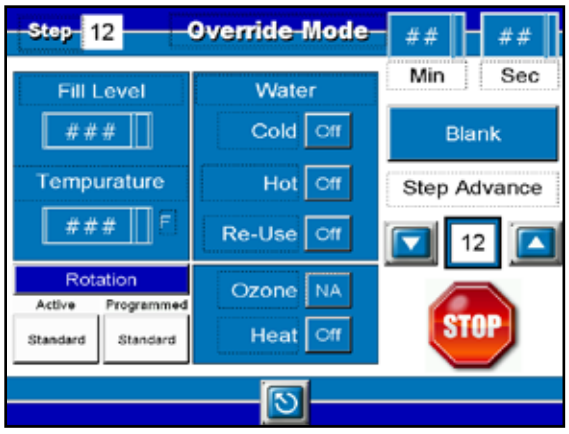
The header indicates the program number, program name, step number and step status. The body contains bar graphs indicating current water level and current temperature with a grey bar for programmed set points. Flashing indicators illuminate for water fill valves, heating, DynOzone operation, and signal outputs. The footer indicates step time and program time. Pressing step time pops out a step view window of programmed step functions. Times indicate remaining time. Supervisor override button (key) halts machine operation for machine override functions.



The Override button allows changes to the following functions:

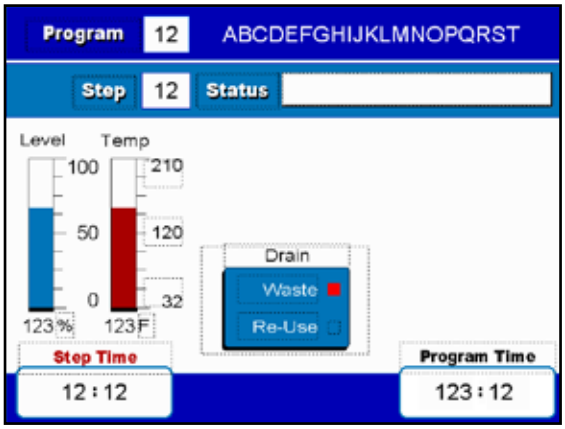
- water level
- temperature
- DynOzone
- heating
- rotation
- step time
- step up or down
- end program

Access to these functions requires a Level 1 password. The machine is in a pause mode during override function and requires the Return button and Resume button to continue or Stop button to abort.



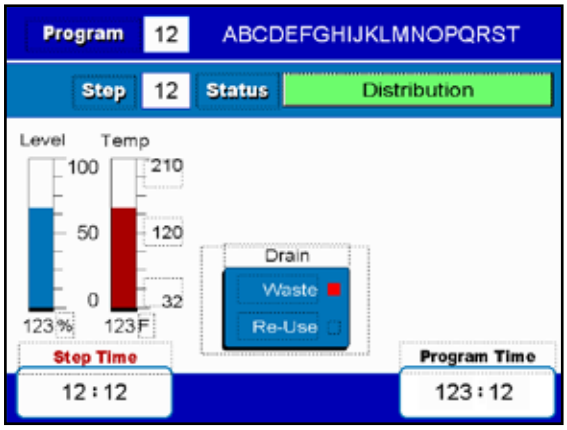
DRAIN SCREEN

The header indicates the program number, program name, step number and step status. The body contains bar graphs indicating current water level and current temperature with a grey bar for programmed set points. The footer indicates step time and program time. Times indicate remaining time. The override function is not available in a drain step.



EXTRACT SCREEN

The header indicates the program number, program name, step number and step status. The body contains bar graphs indicating current water level and current temperature, and indicator for drain type. A display indicates cylinder speed. The footer indicates step time and program time. Times indicate remaining time. The override function is not available in an extract step.



PROGRAM COMPLETE

At end of program, a Program Complete screen will appear and buzzer will sound. After safety brake time and safe mode conditions are meet the door can be opened and goods removed. Door button activated door lock screen. Return button on goes to Load Program screen with most recent run program pre-loaded.

ALARMS AND WARNINGS

During operation safety alarms will appear if a malfunction occurs. Alarms are fatal and will abort program. Warnings can be reset, by-passed or aborted. Follow screen instructions for appropriate action required.

Sample Alarm: E-Stop engaged. Machine sent to safe mode. Reset component. Alarm History screen appears with list of last 10,000 alarms.

List of Alarms:

- Emergency Stop
- Wash Motor Overload
- Extract Motor Overload
- VFD Overload
- Door Open During Operation
- Low Air Supply
- Ozone Pump #1 Failure
- Ozone Pump #2 Failure
- PowerCell bank less than 50%
- Out of Balance Failure

Sample Warning: Water Level Timeout. Machine sent to pause mode. Reset timer, or override warning

List of Warnings:

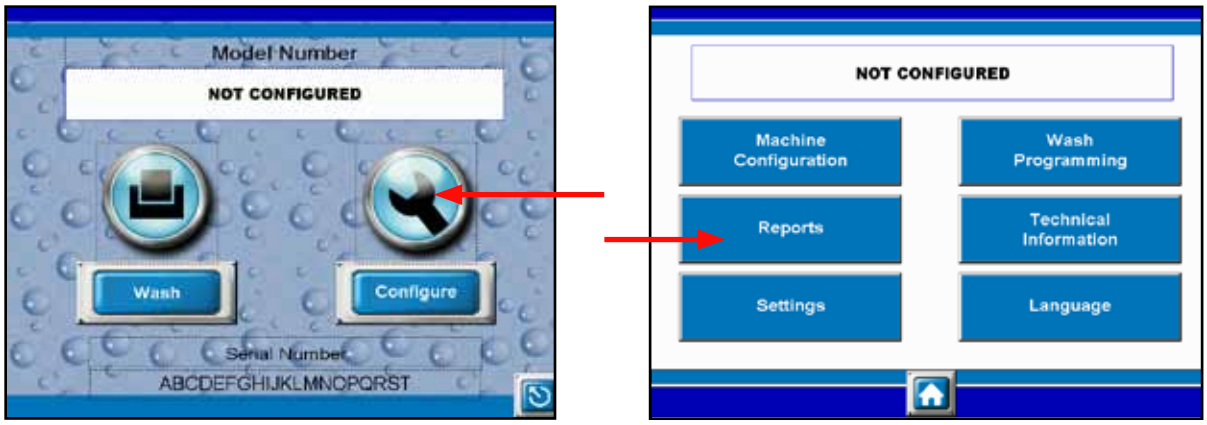
- Temperature Timeout
- Water Level Timeout
- High Temperature in Wash Tub
- High Water Level in Wash Tub

REPORTS

The following reports categories are available for viewing the machine's history of operation:

• Alarms • Counters • Program History

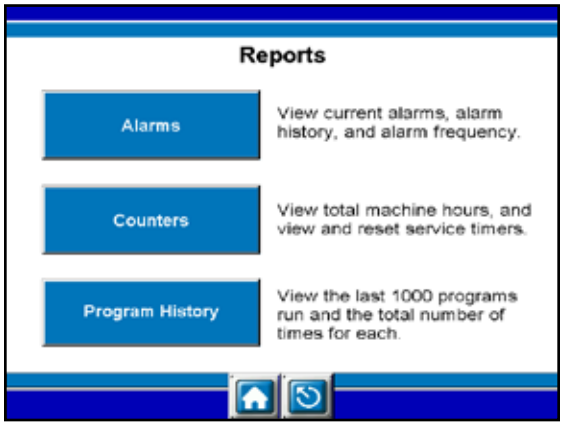
To view Reports, press the Configure button from the Home screen, then select Reports.



• Alarms
View current alarms, alarm history and alarm frequency

• Counters
View total machine hours, and view and reset service timers

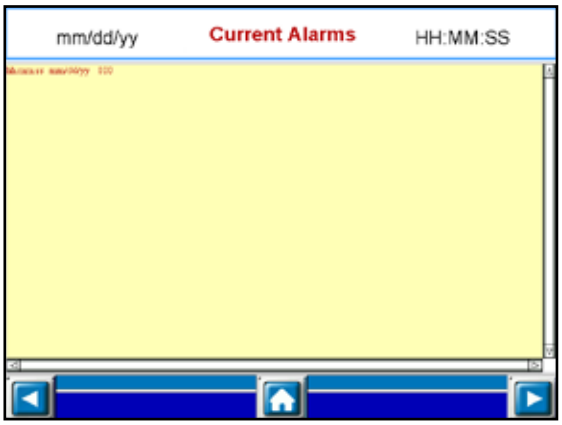
• Program History
View last 10,000 programs run, total times, and cumulative data log with stop mode actions

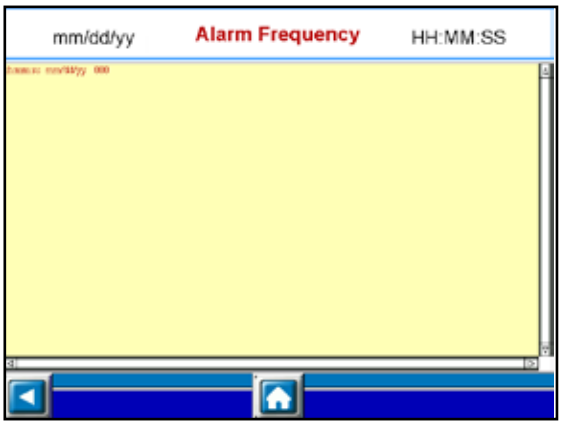


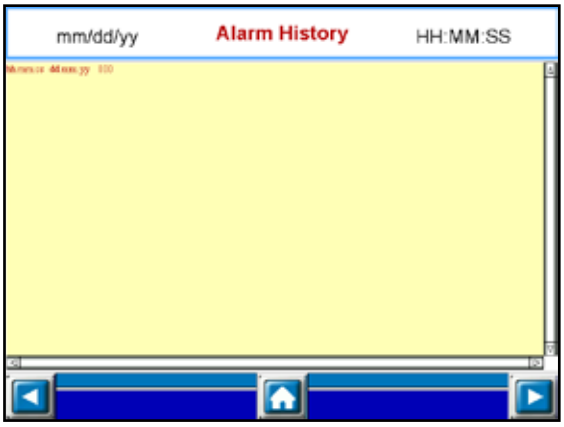
ALARMS

There are three alarm reports:

- Current Alarms are active machine alarms.
- Alarm History contains the last 10,000 alarms.
- Alarm Frequency details the number of times a particular alarm occurred.



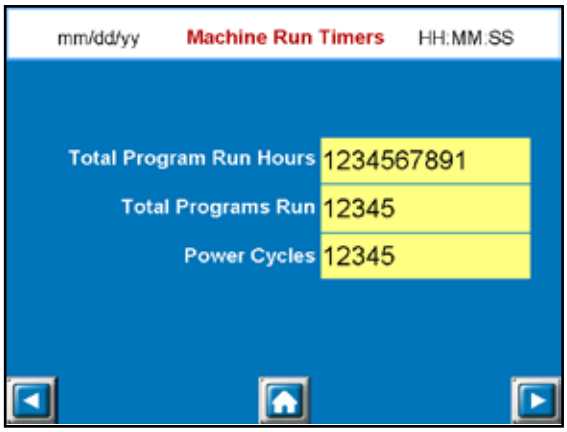




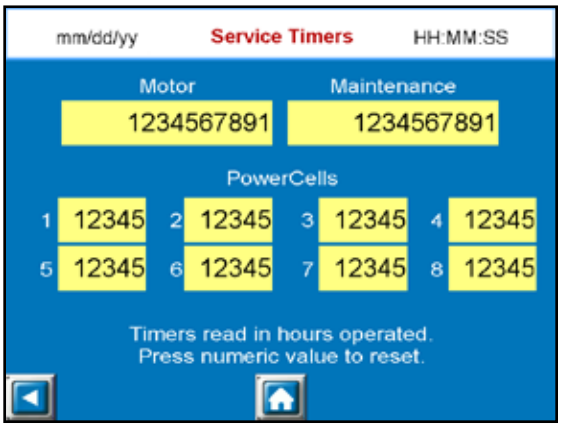
COUNTERS

There are three counters. These cannot be reset.

- Total Machine Run Time counts hours of machine operation
- Total Programs Run counts total programs
- Power Cycles count On/Off.

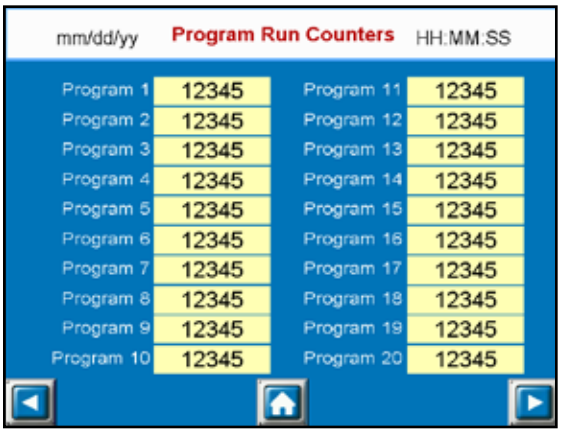


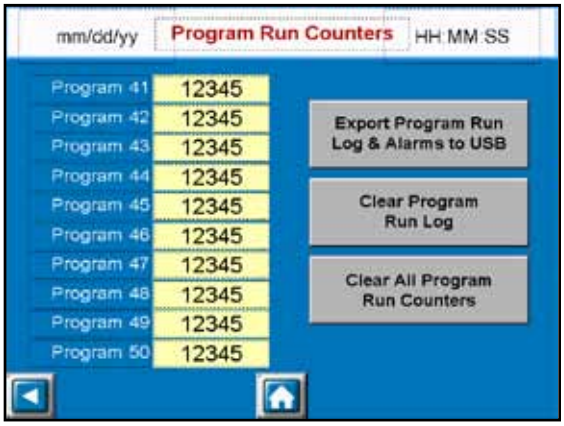
Service Timers count the hours of operation from the last reset. These timers are tied into the service maintenance pop up screens and are re-settable with password security.



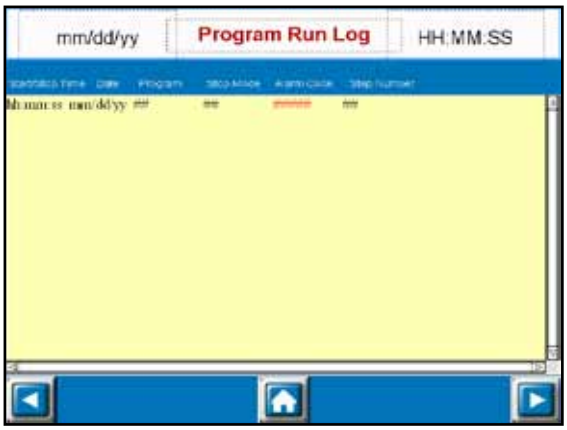
PROGRAM HISTORY

View the last 50 programs run with a time stamp, and the total number of times for each.





Program Run Counters may be reset to zero by pressing the program count number and entering a Level 2 password. On page 3 of the Run Counters, a master reset is located as well as an Export to USB feature to move data out of the control.



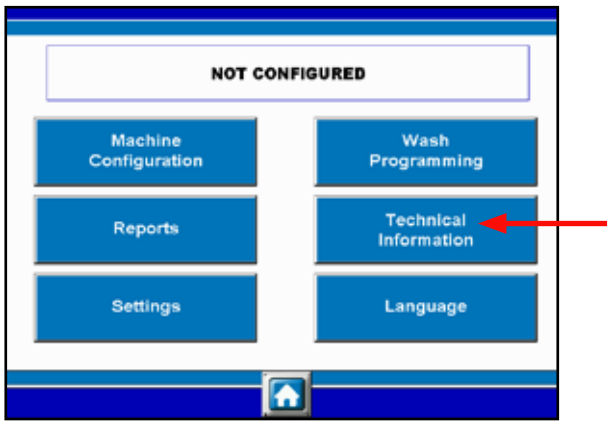
Program Run Log date/time stamps each program start/stop with following data:

- Program Number
- Stop Mode
- Alarm Code (if applicable)
- Step Number (of step when program was stopped or cycle completed)

This data is stored in the HMI but can be copied to a SD card in CSV format for exporting in Microsoft Excel for viewing.

TECHNICAL INFORMATION

DynaTrol provides several means for technical assistance and troubleshooting. First, each machine is configured with the Model Number and Serial Number on the Home screen. Use this information whenever contacting EDRO technical support for assistance. To enter DynaTrol's technical information section, press the Configure button from the Home screen. Then select the Technical Information button. A password is not required to continue.

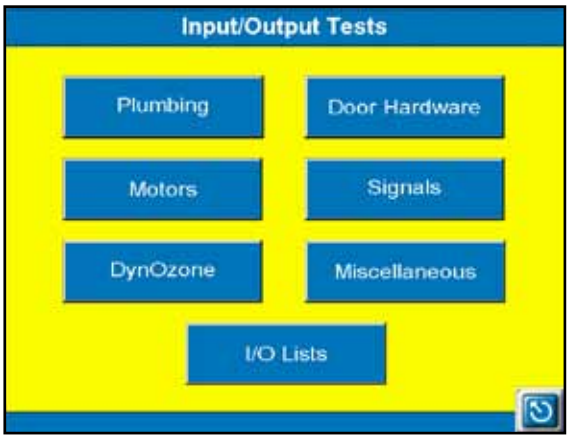


A copy of the Control Manual is located in this section.

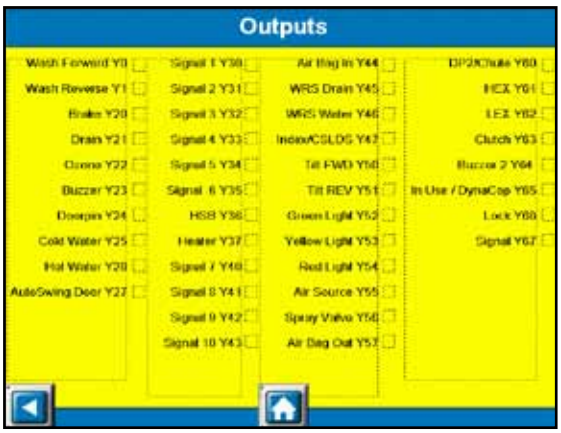
The Debug Screens are for advanced troubleshooting. A level 3 password is required to continue. These screens allow the service technician to view and activate most inputs and outputs.

- Proceed with caution as interlocking safety features are disabled.
- Do not wash clothes using the Debug Screens.

Debug Screen home page.

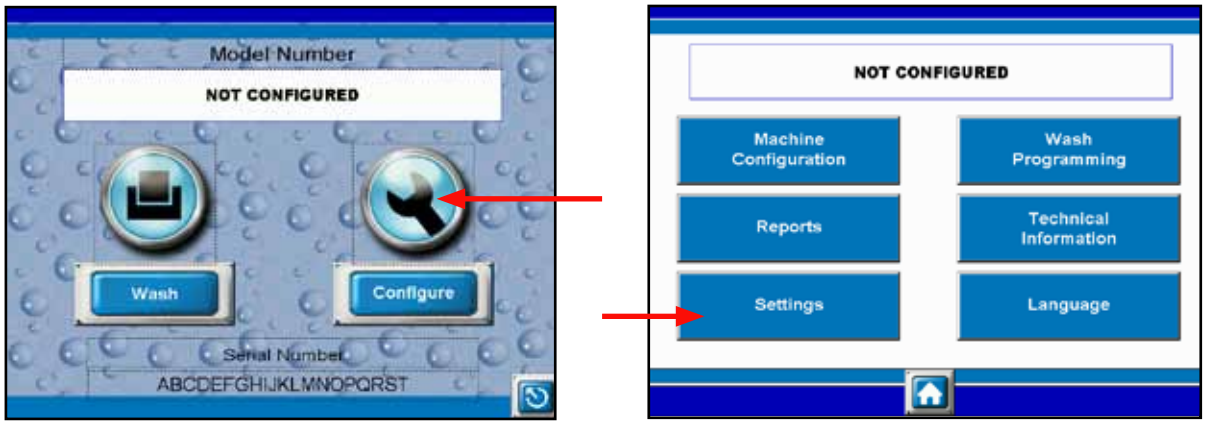


Select a range of inputs/outputs for troubleshooting. A red light will appear next to the active relays, meaning the control circuitry is firing. Refer to the machine schematic for X (input) and Y (output) descriptions. The I/O Lists illustrates all inputs and outputs of the control's PLC expander relays. Refer to the machine schematic for X (input) and Y (output) descriptions.



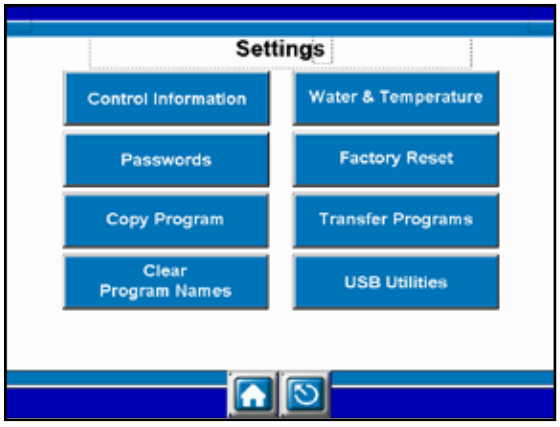
SETTINGS

To enter DynaTrol code settings, press the Configure button on the Home screen, then select the Settings button. A password is not required to continue.



HMI System Doctor settings can be accessed via the reset button located in the back of the control unit. Consult factory for proper configuration of System Doctor settings.

DynaTrol code settings allow for access to Password Management, Water & Temperature Settings, Time and Date settings, Control Software version, Screen Calibration, Copy and Transfer Programs, Resetting of Factory Programs and Machine Configuration, and USB Utilities for configuring media and off loading Report data.



CONTROL INFORMATION

Displays the software version of the PLC and HMi.

TIME & DATE SETTINGS

Set the current time and date for report accuracy.

SCREEN CALIBRATION & BRIGHTNESS/CONTRAST

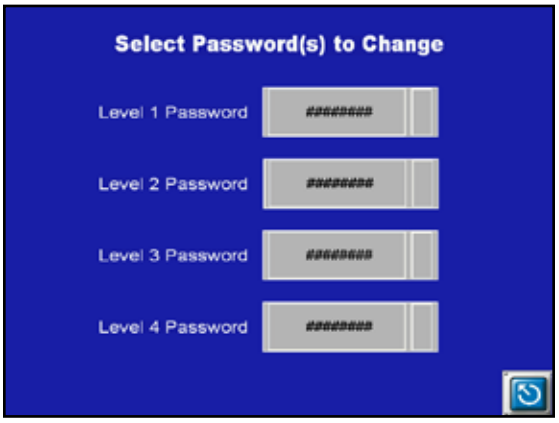
Sets screen for best performance.

PASSWORD MANAGEMENT

DynaTrol is equipped with 4 levels of security. A user can only operate screens granted by their security level. Higher level passwords control all functions and settings of lower level passwords. For example, a level 2 user has all the authority of level 2 and level 1 users, and ability to change both level 2 and level 1 passwords. Machines are shipped from the factory with the following passwords settings:

Level	Description	Default Password	
0	User	00000000	
1	Supervisor*	11111111	*Override Mode
2	Programmer	22222222	
3	Maintenance	33333333	
4	Owner	44444444	

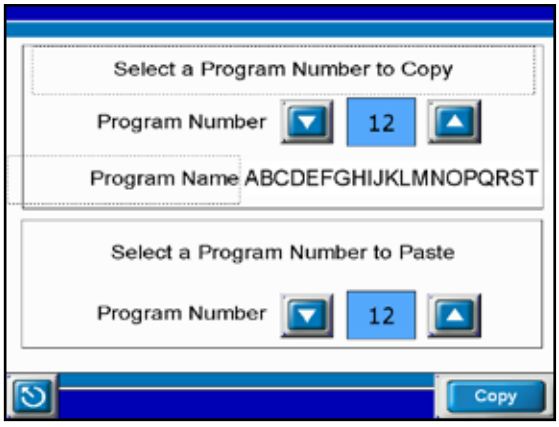
To change your password, select Passwords from the Settings Home page and enter your password to continue. Follow screen instructions.



There is also a Master Password Reset feature. Contact EDRO service for Reset Code.

COPY PROGRAM

To speed programming of similar wash programs, select the copy program function.
A level 2 password is required. After copy function is complete, copied program is fully editable.

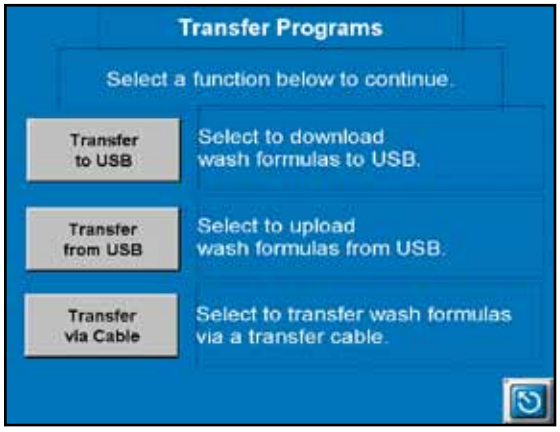


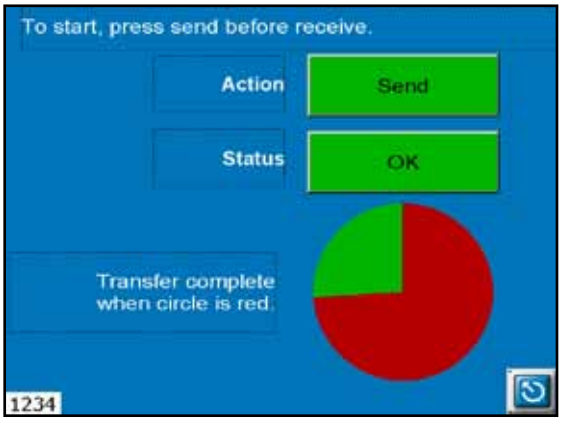
CLEAR PROGRAM NAMES

Clears all wash program names and reverts to “Program 1”, “Program 2”, “Program 3”, etc. A level 2 password is required. This action cannot be undone.

TRANSFER PROGRAMS

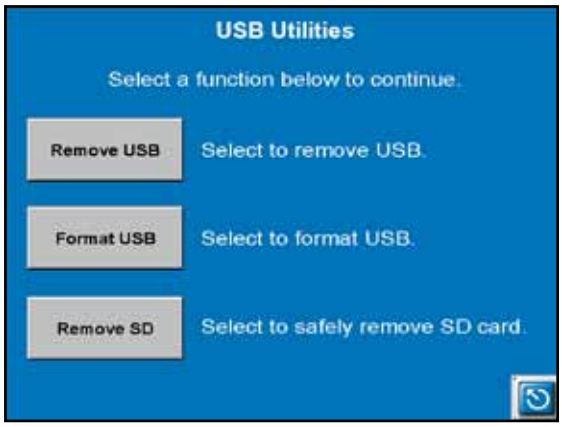
Wash programs can be transferred from one HMI control to another either through cable connections or USB. From Settings screen select USB or Cable connection.





USB UTILITIES

Transferring wash programs via USB requires a properly formatted media device.
Start by Formatting USB via the USB Utilities screen. Navigate from the Settings screen to USB.
You can then transfer programs to and from the HMI and USB.



RESET FACTORY PROGRAMS

Resets wash programs to factory defaults.
A level 2 password is required. This action cannot be undone.

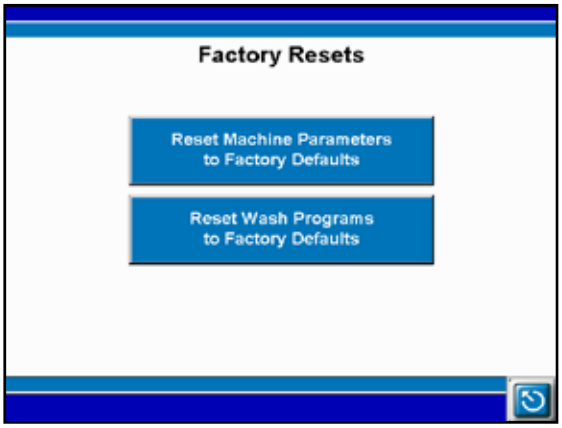
DEFAULT FACTORY PROGRAMS

1. Light Soil - Ozone
2. Light Soil - Ozone
3. Medium Soil - Ozone
4. Medium Soil 2 -Ozone
5. Heavy Soil - Ozone
6. Delicates - Ozone
7. Delicates 2 -Ozone
8. 3 Hour Soak - Ozone
9. Rinse and Spin - Ozone
10. Stain Buster - Ozone
11. Light Soil
12. Light Soil 2
13. Medium Soil
14. Medium Soil 2
15. Heavy Soil
16. Delicates
17. Delicates 2
18. 3 Hour Soak
19. Rinse and Spin
20. Stain Buster

If the machine is not equipped with DynOzone or the ozone system is not functioning, run only programs 11 through 20.

RESET MACHINE DEFAULTS

From the Settings screen select Factory Resets, then Reset Machine Parameters to Factory Defaults.
A level 4 password is required. Follow screen instructions formodel specific machine characteristics.



DYNOZONE - DYNAWASH® OZONE SYSTEM

Your new EDRO washer-extractor is equipped with a revolutionary on board ozone system, the DynOzone – DynaWash® Ozone System. This exclusive system features our patent pending PowerCell ozone generators and is completely integrated within the machine. There are no separate controls, hookups, floor or wall space required. The system is extremely simple, yet amazingly effective.

Programming

DynOzone is a machine feature that can be programmed in any wash/rinse step. To activate DynOzone, you must enter the programming mode. Selecting the “Ozone” button on the wash/rinse setup screen will activate the PowerCells and pump. They will simultaneously run for the programmed time of the step selected.

 Note:

- DynOzone will only be activated if you program it.
- DynOzone can be programmed in any wash/rinse step.
- DynOzone will shut off if the temperature is set above the configured setting.
- DynOzone and heat cannot be programmed in the same step.

Theory of Operation

Benefits of ozone applications in laundry have been well documented. These systems provide a washing process that allows the laundry to be sterilized, disinfected, bleached and deodorized with reduced water, chemicals and heat. However, until now all ozone systems have been externally connected to washing machines, require extra wiring, floor and wall space and much maintenance to properly operate. The DynOzone – DynaWash® Ozone System is different. Besides using patent pending PowerCell ozone generators which create a special activated oxygen gas, it the only system available that is built onto and fully integrated into a washing machine, and controlled and monitored by the machine’s fully programmable control. For best results, the DynOzone – DynaWash® Ozone System needs the proper chemistry and wash programs. Therefore we recommend consulting your chemical supplier before using the system. Maximum efficiency will depend on the chemicals you use, and the wash programs you create.

Here are some helpful hints on using DynOzone.
DynOzone works best in cold water. This is because DynOzone adds molecular energy to the water in the form of a many activated oxygen species as a diffused gas. The hotter the water quicker the gas diffuses. Since you want to maintain maximum surface exposure of the gas bubbles and the water so that proper saturation is attained, it is recommended to wash in temperatures below 120ºF. One aspect of the DynOzone gas is to act as a water purifier, allowing the water to hold dirt particles in suspension permitting the water to absorb more. In essence, this means fewer rinses are required in your wash program. DynOzone is a special gas created by ultra violet radiation. The PowerCells contain a special VH quartz crystal glass that emits specific UV wavelengths creating both ozone and germicidal oxygen species. The ozone producing wavelength is an effective oxidizer, while the germicidal producing wavelength is extremely effective in killing microorganisms. This special gas when combined with water yields remarkable results. After using DynOzone you will notice a fresh clean scent to the laundry, similar to the outside air right after a lightening storm or the scent of clothes drying in sunshine on a clothesline.

DynOzone – DynaWash® Ozone System has many practical uses in the laundry.

1. It can be used to reduce hot water consumption because the molecular energy of the gas replaces the energy of the heated water (heat = energy).
2. It improves the “hand” or feel of the laundry because washing in cold water relaxes fibers and is not as harsh on the fibers as hot water and laundry chemicals such as bleach.

3. It acts as an effective bleaching agent to brighten laundry. This is due to the fact that singlet oxygen molecules are produced by the PowerCell generators. When these molecules combine with water (H_2O), hydrogen peroxide (H_2O_2) is made.
4. It destroys bacteria more effectively than heat and chlorine bleach through oxidation and germicidal kills.
5. It can be used as an odor remover. For instance, item's washed & dried, can be returned back to the washer for a final non-fill “DynOzone" odor removal program.
6. It can be used in smoke restoration in a specially designed over night soak program.

System Monitoring During Operation

Your DynOzone equipped washer-extractor incorporates a monitoring system for each PowerCell and each pump (as applicable). If any part of the system fails, the red lights on the DynOzone monitoring display will turn yellow. If the PowerCell bank falls below 50% capacity, the machine will shut down and an error screen will appear. The PowerCells and ballast wiring should be checked immediately. If the PowerCell has failed, contact EDRO parts department for information on the PowerCell exchange program. The pump(s) is also monitored during operation. If failed, it will stop all machine functions, go to an error Stop screen and sound an audible alarm. Press the Return to reset. Call your serviceman to repair. You can however elect to run the machine in non-ozone wash programs.

DynOzone – DynaWash® Ozone System Maintenance

The washing efficiency also depends on how well DynOzone system maintenance is performed.
Here is a list of system maintenance.

1. PowerCell. PowerCell life is 5,000 hours, or approximately 18 months of operation. After that point the quartz crystal of the UV lamp looses its effectiveness in emitting the required light wavelengths. After the expiration date on the PowerCell label or if the PowerCell fails, it can be exchanged by contacting EDRO spare parts department.
    a. Air intake filter. The air intake filter is located on the bottom end of each PowerCell. Note that on some models you will need to remove panels to reveal the PowerCells. These should be clean and free of lint in order to provide a free and clear path for the ambient room air to be drawn in and supercharged by the PowerCells. It is a good idea to keep a few of these air filters on hand, to avoid down-time.
    b. PowerCell Exchange Program. EDRO has an exchange program to facilitate PowerCell replacement. Call EDRO spare parts with your order at 860-828-0311 ext. 114 and have the machine serial number ready before calling. EDRO requires return of the failed PowerCell in order to exchange for a new one. You can purchase a new PowerCell, however cannot receive the discounted price for the replacement PowerCell without returning one.
        i. Part number for 24” PowerCell is 3720-1
        ii. Part number for 36” PowerCell is 3720-2

2. Pump. The specially designed ozone safe air pump requires annual maintenance for peak performance. Annually check to make sure air flow is unobstructed by removing the tubing and running the system in manual operation. If noticeably less airflow or excessive noise is observed, the valve plate or waved diaphragm may need replacement. These items should be replaced every (2) years.

3. Tubing. The tubing used to deliver the gas is made of a special material. This tubing, especially between the backflow preventor and diffuser, should be replaced every (3) years or when notice ably deteriorated.

4. Fittings. There are fittings on the PowerCells, pump and within the tubing. There is also a check valve prior to the diffuser. These items should be checked annually and replaced as required.

5. Ballast. The ballast used to power the PowerCells are smart electronic type ballasts. They regulate the voltage required to fire the PowerCells and maintain operating current. No maintenance is necessary.

MACHINE FEATURES

SUSPENSION SYSTEM

The suspension system consists of four (4) independent assemblies located on the four (4) corners of the machine. Each assembly consists of a heavy duty, reverse loaded coil spring, and a set of permanently sealed tuned shock absorbers. The system is designed to minimize the transmission of vibration to the foundation. This feature makes the machine ideal for upper floor installations.

AUTOMATIC SUPPLY INJECTION

The machine features five (5) compartment liquid/dry supply injection with individual water solenoid valves, which flush the contents at predetermined cycle times, as optional equipment. In addition, CSL washer-extractors are pre-wired for connections for up to ten (10) chemical supply signals. The control provides time programmable settings for the ten (10) signals.

DYNOZONE - DYNAWASH® OZONE SYSTEM

CSL soft mount washer-extractor are equipped with an onboard closed loop ozone generating system. Sized specifically per machine model, the DynOzone – DynaWash Ozone System is capable of reducing hot water and chemical usage while still maintaining superior wash results. The system includes a combination of ozone generating PowerCells and centrifugal pumps which inject ozonated air into the wash tub. A series of indicators on the wash screen display show system activity. Programmed and operated by the washer's control, DynOzone can be programmed to turn on or off in any wash/rinse step of a program. This feature makes it a versatile method in cleaning various load conditions.

DIRECT STEAM HEATING

The steam heating feature provides for simple, efficient, and accurate generation of hot water. Direct steam injection injects live steam into the shell through an automatic steam solenoid valve. The live steam is then sent through a stainless steel noise silencer and generates hot water through direct steam diffused with the water.

WATER REUSE SYSTEM (OPTION)

The Water Reuse System option, or WRS, utilizes an additional control output, WRS drain and WRS inlet valve on the washer-extractor that enables the machine to save rinse water from a pre-selected program step and reuse the stored water in a future step or program. The additional inlet valve and drain are controlled independently by the control. The WRS option does not provide for external piping, pumps or a water storage tank. In some instances where the temperature of the reclaimed water is maintained, the storage tank should be equipped with a tank heater. When gravity filling or draining is not available, pumps are required in the re-circulating piping. Pump contactors can be interfaced with the WRS water inlet and/or the drain. Refer to the control section for programming instructions.

 Note:

- Reference control schematic for appropriate electrical connections.

ADJUSTMENTS

The vibration switch is preset to stop the machine when it becomes out of balance. The vibration switch is located in the front of left side and covered by side panel. It consists of adjustable base plate; over-travel limits switch spring and impact. In case of over-vibration, the case flange will touch the spring, which will cause the impact head to activate the micro-switch. The properly setting distance for testing over-vibration is 12-15mm. Any over-vibration could damage the machine or harm personal. To properly adjust, the set of three (3) screws can be loosened, allowing the rod to slide up or down within the bracket. To adjust horizontally, the vibration rod should be ¼ " from the head of the bolt. Either tighten or loosen the screw to attain proper measure. This vibration switch will trip off the machine if any excessive motion occurs during its operation. It is very important to understand that proper leveling of the machine will result in optimum performance.

Testing and maintenance:
Pull the spring to confirm it can strike micro switch within the distance of 12-15mm. If the switch is triggered you may hear a “Click” sound. If the trigger distance does not meet the needs of 12-15 mm, you may loosen the screw on the adjustable base plate to a suitable distance, and then retighten screw.

 Note:

- MACHINE MUST BE ADJUSTED SLIGHTLY BACK (1º) (WHEN MEASURED FRONT TO BACK) AND LEVEL LEFT TO RIGHT.

Adjusting and maintaining the ***air regulator***:

1. Adjust the jaw opening of oil point. Generally, turn 1-2 rounds, oil path will be fully opened. Operator may observe oil drip condition.
2. Turn the knob counter clock-wise before supplying compressed air. Turn on supply air and gradually turn the knob clock-wise until pressure reaches 0.4-0.5 MPa, then lock it with the braking knob.
3. Drain water from air dehydrator regularly.
4. While oil level is nearby the lowest level, please oil it to high level.
5. Clean filter core and water cup regularly.

PERIODIC MAINTENANCE

Initial Post-Installation Maintenance Requirements.

For the first week or two following the initial installation, your EDRO DynaWash® CSL washer-extractor requires attention and frequent check-ups. A number of adjustments should be made and the bolts and nuts tightened if found loose. This is due to the setting of the machine in place as well as expansion from heat and motion. Keep checking the following:

1. The floor bolts must be kept tight and checked periodically.
2. The nuts on the front plate may come loose from the softening of the gasket and should be gone over at least once even though no leaks develop.
3. Check the taper lock bushing screws on all pulleys, especially the main drive. If any looseness is observed, re-check once more - - if found tight, no need to inspect again. See that pulleys have not moved from original position.
4. Check the main bearing, both front and rear.
5. Check the tension of the belts on main pulleys. Start with the screw nearest the driver pulley. When desired tension is obtained, lock in place. With the remaining screws, adjust until contact with block. This will keep the motor plate level and prevent any distortion.
6. After two (2) weeks, grease bearings and put a few drops of oil on the door hinges, and door lock.

PERIODIC MAINTENANCE REQUIREMENTS

1. Grease bearings as usage requires (see Maintaining the Bearings). If bearings become noisy, it does not necessarily mean they have to be replaced. Usually it is a lack of grease, but sometimes they may have to be adjusted for less clearance.
2. Put a few drops of graphite or light oil on the front door hinge, and lock pin.
3. Motor should be greased only once a year.
4. Keep belts tight.

 Note:

- Reference control schematic for appropriate electrical connections.

LUBRICATING INSTRUCTIONS FOR MOTORS

When greasing, the following steps should be followed:

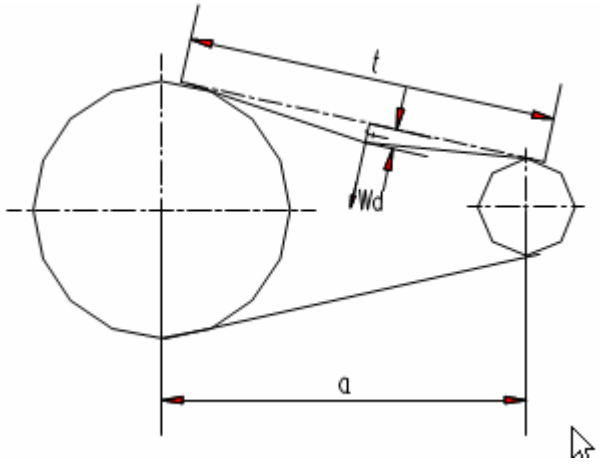
1. Clean the exterior of the part.
2. Remove both the grease plug and the relief plug.
3. If grease has hardened, run a rod or wire a short distance into chamber to break grease.
4. Grease motor with low pressure gun.
5. Run motor until new grease flows from drain plug. For optimum operation, the bearing chamber should be ¾ full of grease.
6. Replace grease and relief plugs.

OPERATING INSTRUCTIONS FOR MOTORS

1. Ambient Temperature - The ambient temperature of the air surrounding the motor should not exceed 40ºC or 104ºF unless the motor has been specifically designed for high ambient temperature applications. Obstructions should not be placed around the motor to obstruct the free flow of air.
2. Wiring - Check the nameplate to insure that the correct power supply (voltage, frequency, and phase) is being used and that the motor is connected according to the connection diagram on the nameplate.
3. Operation - This motor is designed to operate with a maximum voltage variation of +/- 10% from the temperature rise. In addition, it should be pointed out that the starting and breakdown torques vary as the square of the voltage. For example, at 10% under voltage, the torques will be 21% below the values at nameplate voltage.
4. Bearings - Bearings sizes and types used on the motors are shown on the nameplate. Replacement bearings may be obtained from any bearing manufacturer.
5. Re-greasing - Under normal operating conditions, it is only necessary to re-grease a ball bearing motor two (2) to six (6) years, depending upon the motor speed and operating conditions. A sound greasing procedure should be followed when re-greasing a motor for it has been determined that the GREATEST CAUSE OF BEARING FAILURE IS OVER GREASING RATHER THAN UNDER GREASING.

BELT ADJUSTMENT AND REPLACEMENT

The motor is fixed with a adjustable bolt mounted on the plate along the belt direction. The belt tension can be adjusted through this bolt. When using a new belt, the fit tolerance of belts should be as small as possible to keep belts standing force equivalently. (Try to keep the belts in the same group with the same length. When adjusting the V-Belt, with the two pulleys the same plane, the belt movement should be less than 0.2 degrees.



MANTAINING THE BEARINGS

LUBRICATION

Pillow block bearings are pre-lubricated. No additional lubricant is required for start-up. As a precaution, if the equipment is to be left idle for any extended period of time prior to actual use, the bearings should be filled 100% full to provide maximum protection from corrosion.

The specific conditions on an application such as exact hours of operation, temperature, moisture, speed and dirt govern the required lubrication cycle. We recommend lubrication of the bearings every one (1) to four (4) weeks with normal machine operation. The lubrication cycle can best be determined by inspection of the flushed out lubricant during a trial period of operation. Use a sufficient volume of grease to purge the bearing seals of old lubricant. It is preferable to rotate bearings during re-lubrication where good safety practice permits. Use the same number of strokes on the rear bearing as on the front bearing. Inspection of bearing installations at least every six (6) months is recommended. Any unusual noise or vibration change should be immediately investigated.

 Note:

- Suggested starting interval for maintenance program. Check grease condition for oiliness and dirt and adjust greasing frequency accordingly. Watch operation temperatures. Sudden rises may show need for grease or indicate over lubrication. Use Keystone 88X or Lubriplate 630AA heat and water resistant grade 2 grease.

REMOVAL

Turn off power and all utilities to unit. Remove rear guards, belts, flywheel and bushing. Hold the drum in place with wood blocks. Mark the front of the drum and rear pf the main shaft to the case to help lineup for reassembly. Unlock both bearings. Remove round nuts from front and rear bearing seats and conical bushing from braking wheel respectively. Back off all bearing jack bolts. Remove all bearing grease lines and bolts. Remove bearing off shaft. Before removing the last bearing, block up shaft and account the position of shim if used.

INSTALLATION

Check to make sure that the shaft is clean and free of burns and nicks (when replacing the front bearing, a Speedi Sleeve is recommended to prolong the life of the shaft). Coat the shaft and bearing bore with grease to facilitate assembly. Install the front bearing on shaft to location over bushing bolt holes. Insert bolt and measure the basket to front plate clearness. Block the basket and front plate and clamp into position. Install the rear bearing on the shaft. Install bolts and tighten up to around 50 in. pounds. Inspect the center position of the basket to the front plate and adjust bearing accordingly. Measure the back plate to the center of the bolts and square the bearings to the back plate. Check the clearness between front Bearing and plate, and adjust with shims if required. Side to side adjustments can be accomplished with the bearing jack bolts after basket is in position. Lock down jack bolts and nuts to secure bearings. Tighten up new main bearing bolts and nuts in off set pattern. Torque bolts in equal amounts. Tighten bearing collar. Remove basket clamps and rotate drum by hand, inspect the center of the drum to the center of the front plate. Adjust with shims if necessary. Re-install grease lines and flywheel. Torque flywheel bolts equal and even amounts. Re-install belts and air lines, position guards in place, and turn ON electrical and air supply.

 Note:

- Any condition of strain, irregular rotational torque, abnormal sound or vibration may be due to improper alignment, improper location, bent shaft, etc. Installation should be rechecked and corrections made as required.

TROUBLESHOOTING

This section provides troubleshooting procedures, information and instructions to identify and correct equipment malfunctions. Troubleshooting is the systematic analysis of a malfunction to identify the cause of the malfunction. It requires a thorough understanding of the equipment operation and an ability to recognize the symptoms of a faulty operation. Troubleshooting procedures are divided into three phases: identification of the symptom or malfunction, identification of the probable cause and performance of the corrective action. This section describes operational characteristics and general troubleshooting procedures.

Preliminary Troubleshooting. Most symptoms/malfunctions may be detected by sight, sound, smell and touch. First, check components that have been recently repaired or have a history of failure. When a variation from the normal operating condition is noted, the symptoms and causes must be determined and recorded. Attempts should be made to locate the most likely causes of a malfunction. Unusual sounds or overheating may point directly to certain components or parts. Also, components that have been recently installed or serviced are possibly the source of failure.

 Note:

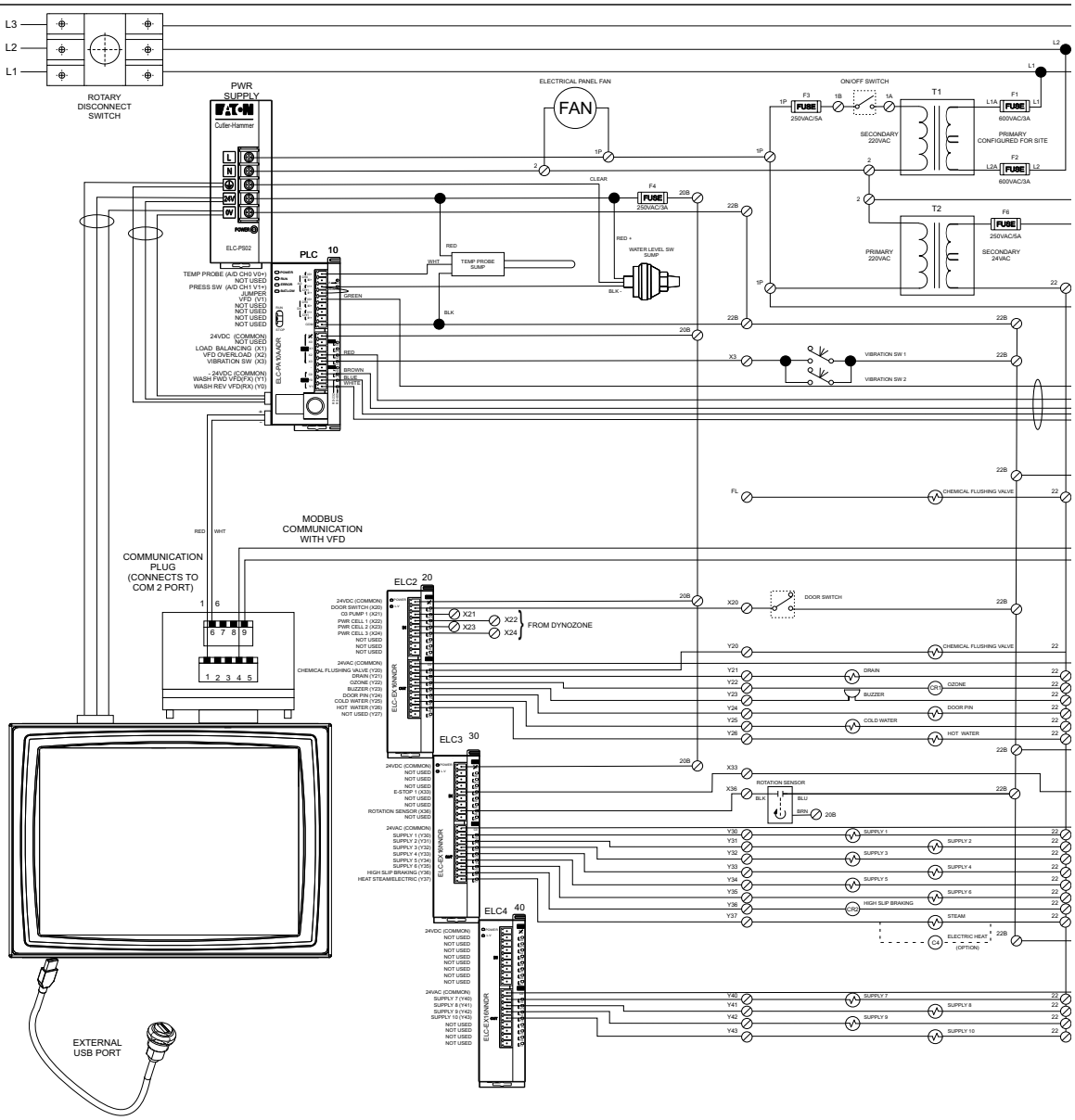
- Any condition of strain, irregular rotational torque, abnormal sound or vibration may be due to improper alignment, improper location, bent shaft, etc. Installation should be rechecked and corrections made as required.

DynaTrol Touch Screen Control. The advanced technology of the DynaTrol Touch Screen Control eliminates the requirement for electro-mechanical devices such as control relays and timers and allows for operation of the pre-programmed wash programs through electronic circuits, timers, and counters. The program steps are stored in the HMI and ELC memory during the program writing operation. When the program is ready to run, the ELC reads the programmed operations from the HMI memory and activates the appropriate outputs (valves, motors, lights, etc.) in the order required. This technology results in simple machine and operator interface, reliable and consistent formula operation, and precise and easy troubleshooting.

General Troubleshooting. The HMI or ELCs have no moving parts and do not wear as mechanical devices do from use. If a problem occurs while the system is running, the cause will most likely be due to failure of an input or output device, such as a limit switch, solenoid valve or overload relay, rather than the control itself. All input and output devices directly related to the process should be checked first when a fault develops. Also, input and output devices are usually easier to check than the control since only a multi-meter is required. The first item to check when troubleshooting the control circuit is the electrical power to the HMI and ELCs. Several fuses are in line with this circuit. Check for an open fuse if power is absent. If the control is determined operational, trouble-shooting of the field devices connected to the ELCs must be accomplished. In order to facilitate troubleshooting, the maintenance personnel must have an understanding of the operation of the machine corresponding to the programmed formulas (i.e. knowing what the machine is supposed to be doing at a certain point in the formula and why). If the inputs are in the correct state (i.e. water level attained) and an output does not energize as shown by the LED output indicator light, check the corresponding voltage at the output terminal. If voltage is not present the ELC must be replaced. If voltage is present on the output terminal the problem is an open circuit in the field wiring or a faulty field device such as a stuck solenoid or a tripped overload.

If an internal input or output relay has been damaged, it may be the result of an electrical short in the components connected to it. Therefore, it is imperative to troubleshoot and correct any electrical problems originating outside the power and relay board prior to installing a replacement. Failure to correct these external problems first may result in damage to the replacement component and void any warranty claims.

ELECTRICAL SCHEMATIC



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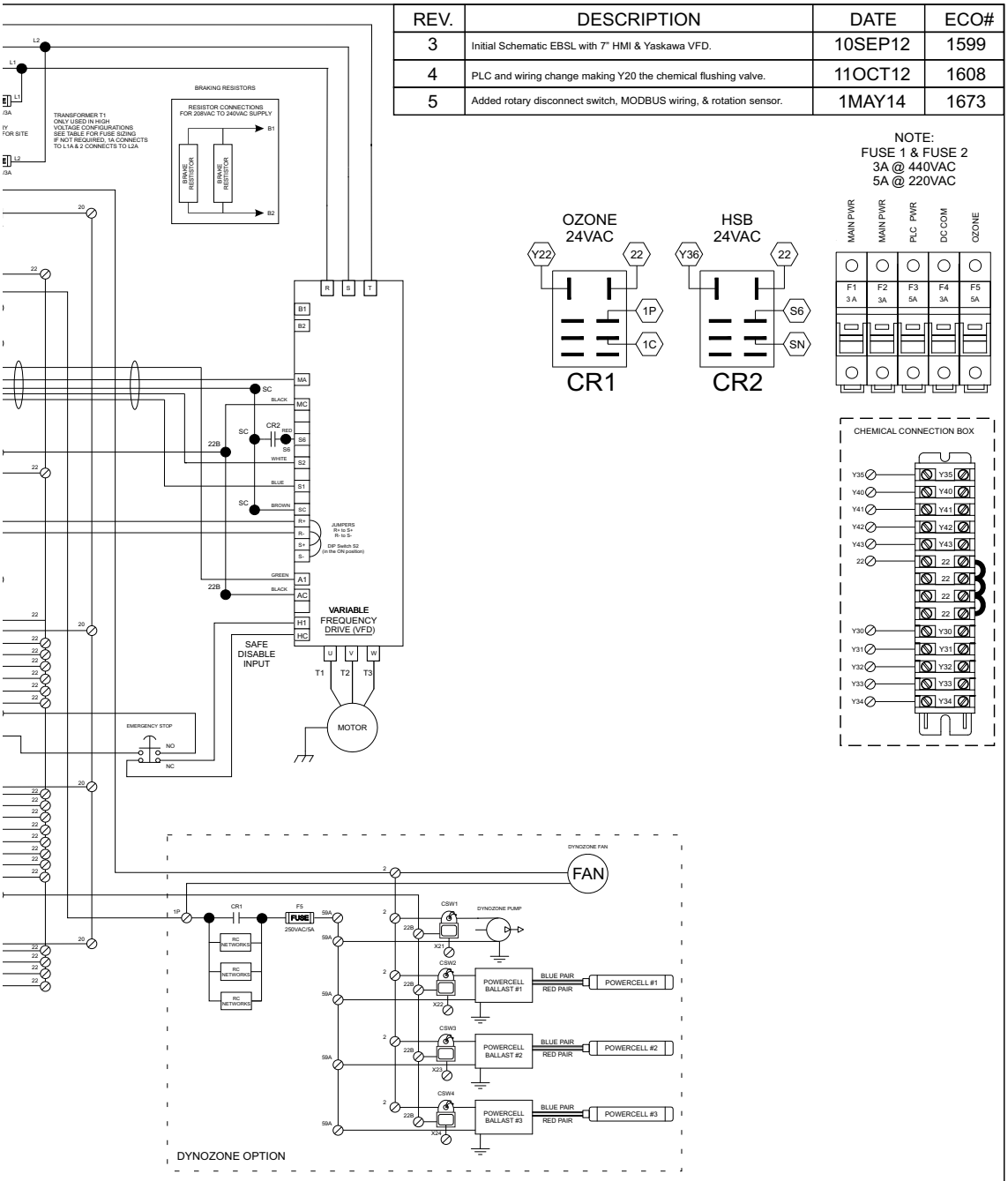
			●	●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						

ELECTRICAL SCHEMATIC

REV.	DESCRIPTION	DATE	ECO#
3	Initial Schematic EBSL with 7" HMI & Yaskawa VFD.	10SEP12	1599
4	PLC and wiring change making Y20 the chemical flushing valve.	11OCT12	1608
5	Added rotary disconnect switch, MODBUS wiring, & rotation sensor.	1MAY14	1673



X24	X31	X33	X37	Y20	Y21	Y22	Y23	Y24	Y25	Y26	Y30	Y31	Y32	Y33	Y34	Y35	Y36	Y37	Y40	Y41	Y42	Y43	Y44	Y45	Y46	59A	S6	SC

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FRACTIONS 1/64 - DECIMALS .005
ANGLES 30 MINUTES - SURFACES 125
-DO NOT SCALE DRAWINGS-

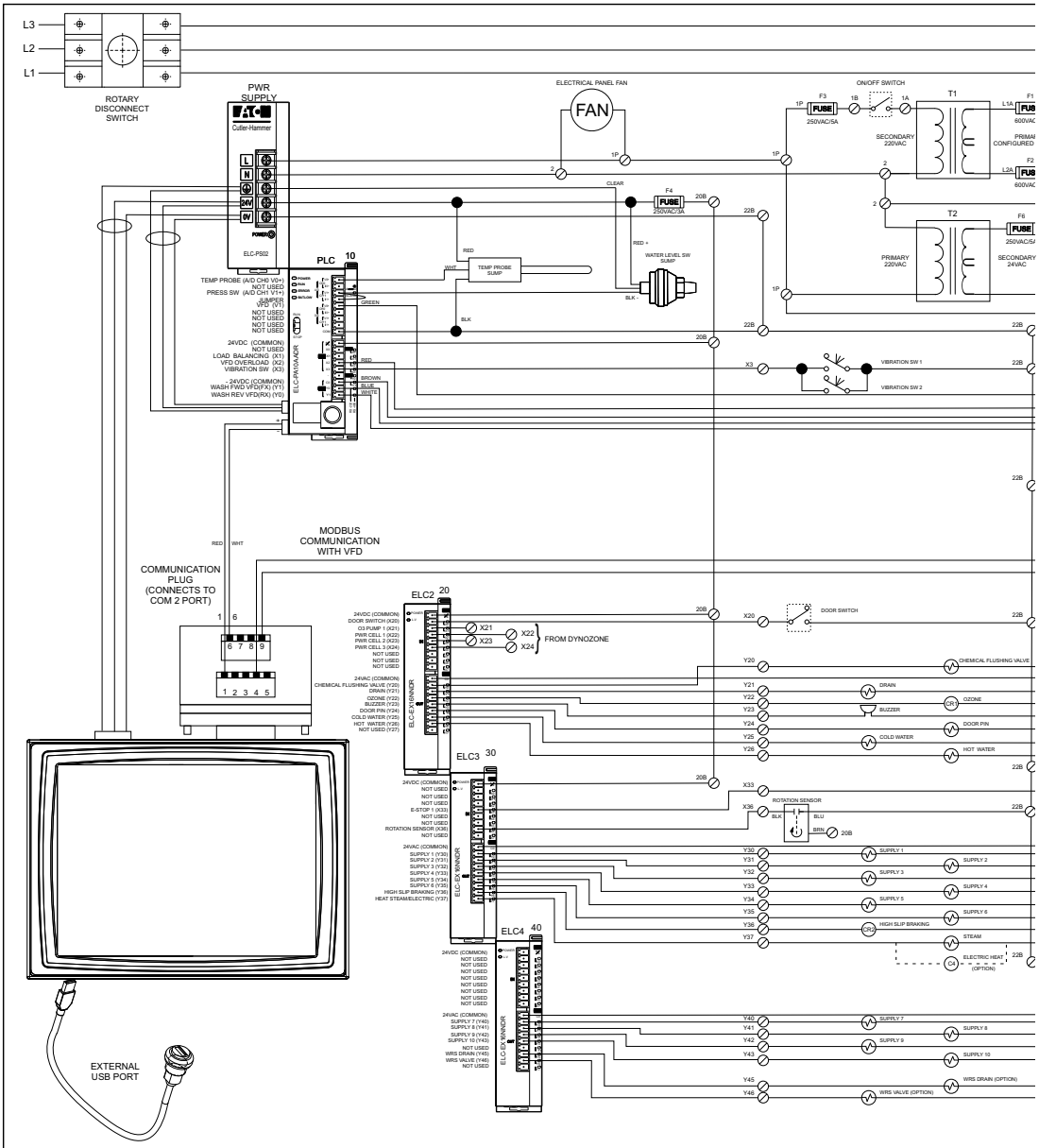
SCALE: NONE	APPROVED BY:	DRAWN BY: KEB	
DATE: 16JUN08			

TITLE: ELECTRICAL SCHEMATIC

CSLTS60600-1.R5 VFD/6 SPEED

MODEL:	REV N0:	FILE:	PART NUMBER:	SHEET:
CSL60	5	EP-CSLTS60600-1.R5	CSLTS60600-1	1 OF 1

ELECTRICAL SCHEMATIC



L1	L2	L3	GND	GND	1A	1B	1C	1P	1P	2	2	20	20	20	22	22	22	20B	20B	20B	22B	22B	22B	X3	X20	X21	X22	X23
			●	●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					

ELECTRICAL SCHEMATIC

REV.	DESCRIPTION	DATE	ECO#
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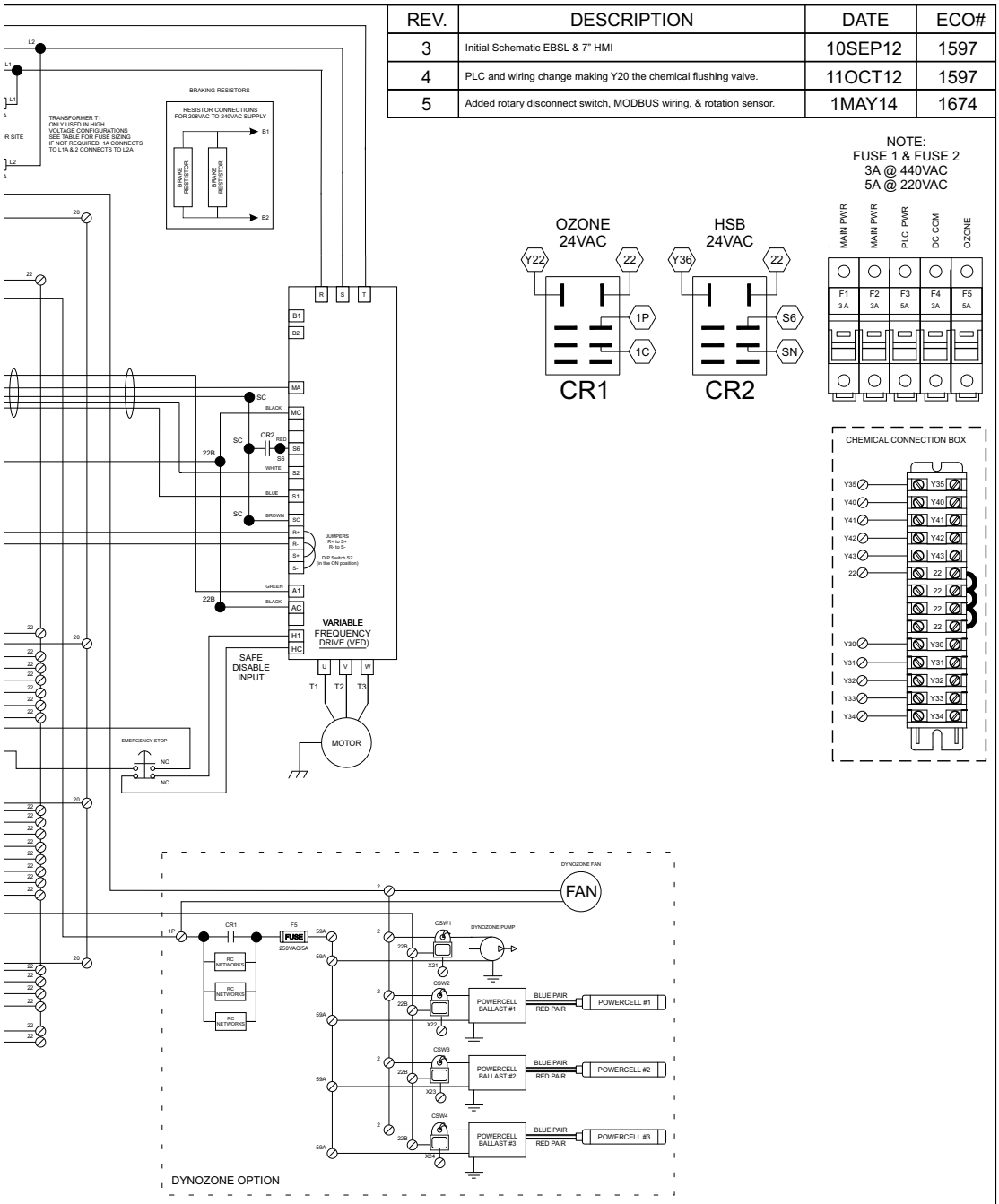

X24	X31	X33	X37	Y20	Y21	Y22	Y23	Y24	Y25	Y26	Y30	Y31	Y32	Y33	Y34	Y35	Y36	Y37	Y40	Y41	Y42	Y43	Y44	Y45	Y46	59A	S6	SC

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ANGLES 30 MINUTES - SURFACES 125
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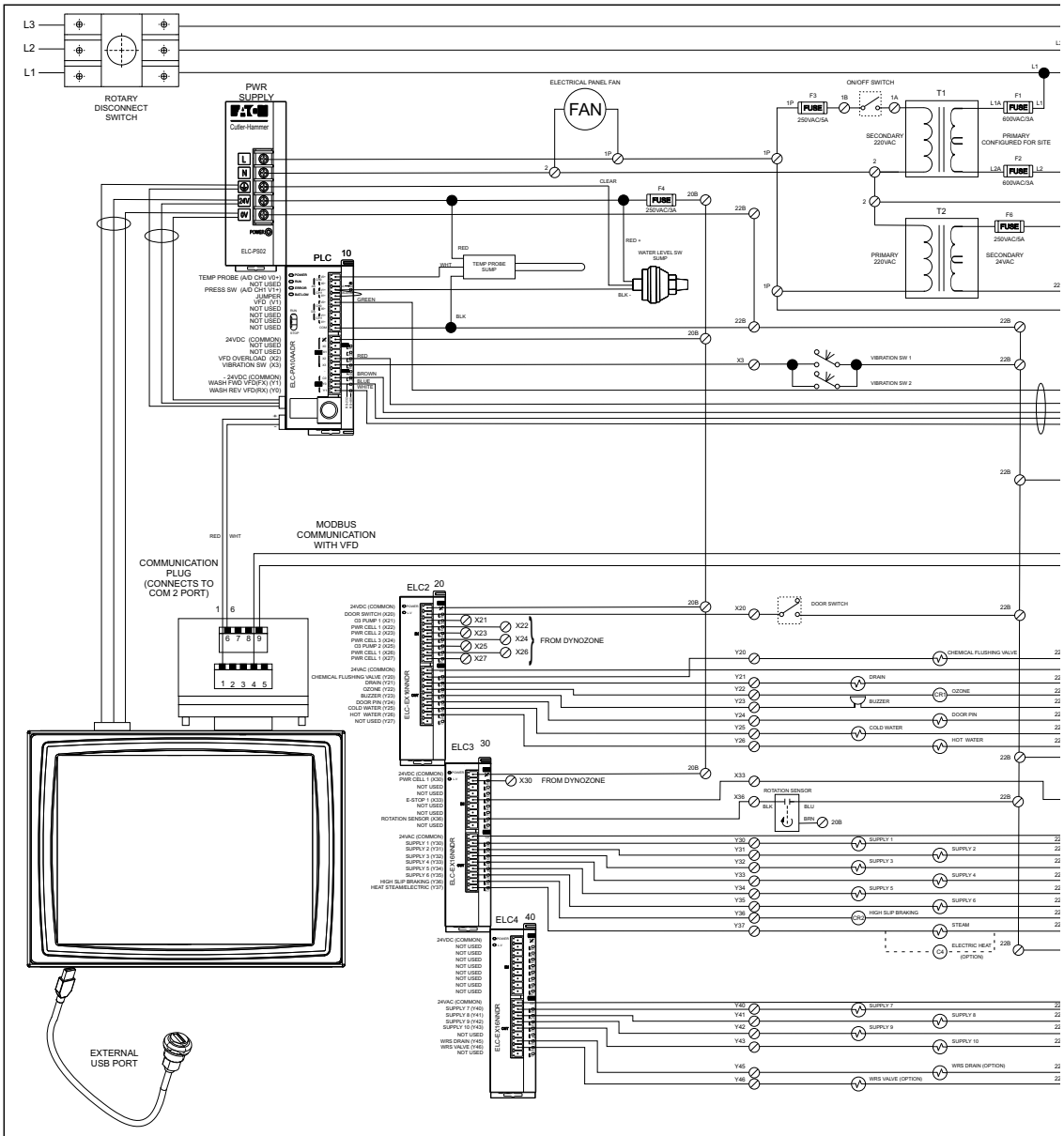
SCALE: NONE	APPROVED BY:	DRAWN BY: KEB
DATE: 16JUN08		

TITLE: ELECTRICAL SCHEMATIC
CSLTS61100-1.R5 VFD/6 SPEED

MODEL:	REV N0:	FILE:	PART NUMBER:	SHEET:
CSL110	5	EP-CSLTS61100-1.R5	CSLTS61100-1	1 OF 1

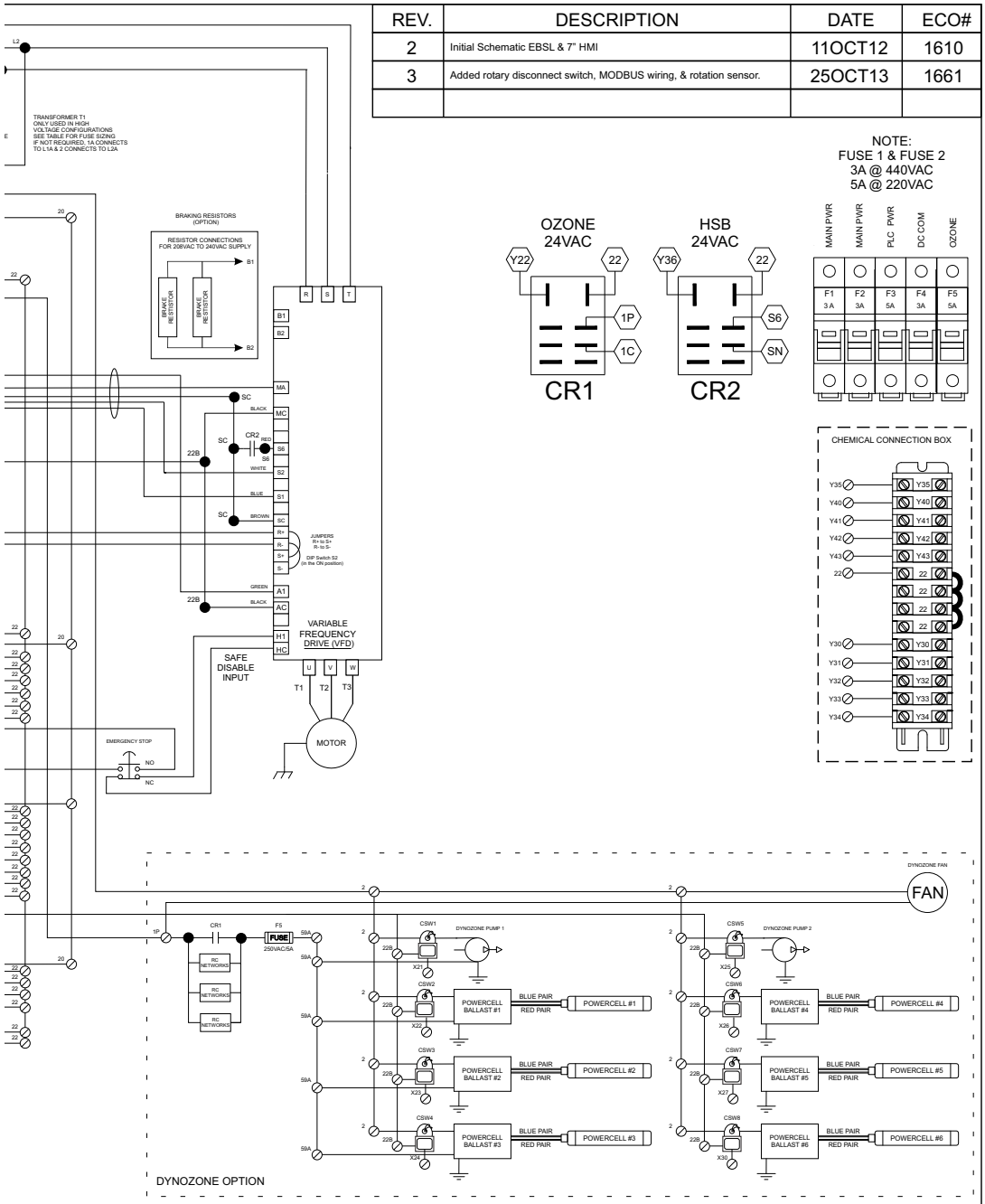
ELECTRICAL SCHEMATIC



L1	L2	L3	GND	GND	1A	1B	1C	1P	1P	2	2	20	20	20	22	22	22	20B	20B	20B	22B	22B	22B	X3	X20	X21	X22	X23	X24	X25	X26	X
			●	●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●									

ELECTRICAL SCHEMATIC

REV.	DESCRIPTION	DATE	ECO#
2	Initial Schematic EBSL & 7" HMI	11OCT12	1610
3	Added rotary disconnect switch, MODBUS wiring, & rotation sensor.	25OCT13	1661



X27	X20	X31	X33	X36	X37	Y20	Y21	Y22	Y23	Y24	Y25	Y26	Y30	Y31	Y32	Y33	Y34	Y35	Y36	Y37	Y40	Y41	Y42	Y43	Y44	Y45	Y46	59A	S6	SC

AUTHORIZATION FOR USE

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Authorized by: _____

Date: _____

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EDRO DYNA WASH®

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LIMITS UNLESS OTHERWISE SPECIFIED
FRACTIONS 1/64 - DECIMALS .005
ANGLES 30 MINUTES - SURFACES 125
-DO NOT SCALE DRAWINGS-

SCALE: NONE	APPROVED BY:	DRAWN BY: KEB
DATE: 6FEB09		

TITLE: ELECTRICAL SCHEMATIC

EP-CSLTS61750-1.R3 VFD/6 SPEED

MODEL:	REV N0:	FILE:	PART NUMBER:	SHEET:
CSL175	3	EP-CSLTS61750-1.R3	CSLTS61750-1	1 OF 1

OPERATION & SERVICE RULES

The following are general rules to observe for safe operation and maintenance of the machine. This is by no means a complete list. As always, use common sense when operating or servicing any industrial equipment.

Operation:

- Operate machine within factory specifications. Do not overload machine.
- Keep all guards and panels in place and secured.
- Obey warning signs and placards.
- Check interlock before starting machine operation.
- Keep away from all machine moving parts.
- Keep machine clean from excessive contact with chemicals.
- Notify supervisory personnel should any problems occur.
- Do not attempt entry into machine until the basket has come to a full and complete stop and the control signals cycle end.

Service:

- Service should be performed by qualified personnel only.
- Maintain equipment on a continual basis.
- Disconnect all power sources and ground equipment prior to performing and service.
- Replace and secure all guards after servicing.
- Repair faulty or leaky gaskets immediately.
- Use only genuine factory replacement parts.
- Replace warning signs and placards immediately if lost or damaged.

IMPORTANT CONTACT INFORMATION

You can reach EDRO service technicians by any of the following methods:

Telephone: (860) 828-0311
Fax: (860) 828-5984
E-Mail: service@edrocorp.com

Technical support and spare parts service is available Monday through Friday from 8:00 am to 4:00 pm Eastern Standard Time.