



USER MANUAL

MODEL:

BLX-600-GEN2

Compact Automated Boot Scrubber

English (Original Instructions)

Updated: 09/18/24



USER MANUAL: BLX-600-GEN2

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT



Table of Contents

System Requirements	03	Advanced Configuration	
Installation		Motor Current Sensor	09
Physical Set-Up	04	Brush RPM Adjustment	09
Plumbing Connections	05	Drive Parameters	10
Motor Speed Adjustment	06	Timing Relay	10
Operation		Maintenance	11
Start Up	07	Troubleshooting	12
Use	07	Appendices	
Shut Down	07	Parts Callouts	14
Cleaning		Electrical Schematics	20
Removing Brushes	08		



WARNING:

1. All personnel using this unit must be familiar with the information contained in this manual. Follow all installation and maintenance instructions.
2. Always wear appropriate footwear. Secure or remove loose items on footwear.
3. Ensure solid footing and use both hands when operating the unit.
4. Avoid contact of chemicals with skin and eyes. If contact occurs, see MSDS sheet for further first aid measures.
5. Follow safety instructions of chemical manufacturer (MSDS).
6. Always follow plant and OSHA guidelines about the use of equipment.
7. Disconnect power before servicing equipment.
8. Always follow safety precautions and obey warning labels. Failure to do so could result in injury or death.



USER MANUAL: BLX-600-GEN2

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT



General

Installation

Operation

Configuration

Maintenance

Troubleshooting

Appendix

Overview

The BLX-600 is a compact automated footwear scrubbing unit built to accommodate 1 user at a time.

The included user manual contain installation, operation, and maintenance instructions for BLX-600 units. For further support or information please contact your sanitation representative, manufacturer, or Clean Logix technical support.

Specifications

- Construction: 304L stainless steel, UHMW, Polypropylene
- Weight: 241 lb (109.316 kg)
- Dimensions: 23" x 28" x 45-1/4"
(58.42 x 71.12 x 114.935 cm)
- Water Consumption: 1.3 GPM
(4.9 L/m)
- Minimum Chemical Dilution Ratio: 1:230*

***NOTE:** Unit tested at 70°F using water with 30-50 psi injector inlet pressure.



WARNING:

DO NOT use flammable liquids (i.e. alcohol based solutions or similar) without dilution.

Cleaning Methods

See pages 8 for disassembly and cleaning instructions. For chemistry recommendations:

Use Case	Chemical Type
Organic Soils	Chlorinated Alkaline or Alkaline based foaming cleaner
Mineral Buildup	Acid based foaming cleaner

NOTE: Chemistry used must be compatible with materials of construction (listed above).

System Requirements

Water Supply

- Flow: 5 GPM (3.8L/m) minimum*
- Pressure: 35-50 psi (207-414 kPa)**
- Temperature: 40-100°F (4-38°C)

3/8" supply piping size recommended



WARNING:

DO NOT EXCEED maximum water temperature! Damage to brushes can result.

***Minimum pressure must be maintained during specified water flow!**

****For consistent operation of Venturi Injector and spray nozzles, a water pressure regulator and filter is recommended.**

NOTE: Back flow prevention must be installed in the water line to this unit. Check local codes to ensure proper installation.

Electrical

All units supplied with 8 ft. power cable with NEMA 5-15P plug. Review specifications based on electrical set up:

- 120V:** 120 VAC Single Phase, 60 Hz 15 Amps
- 230V:** 230 VAC Single Phase, 60 Hz 15 Amps

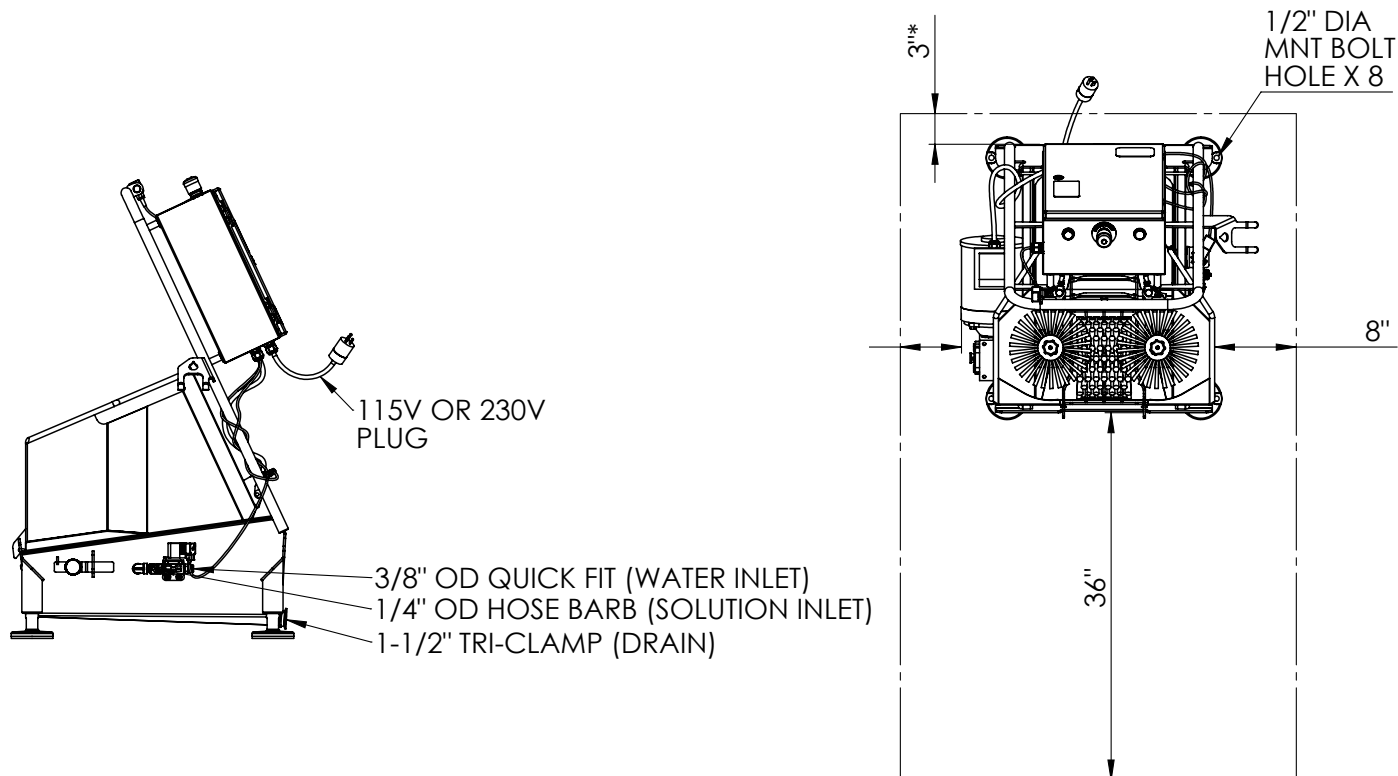
NOTE: Clean Logix recommends Leviton's GFCI protection device [# **GFRBF-W**] for circumstances where the facility's original GFCI plug is not applicable.

USER MANUAL: BLX-600-GEN2

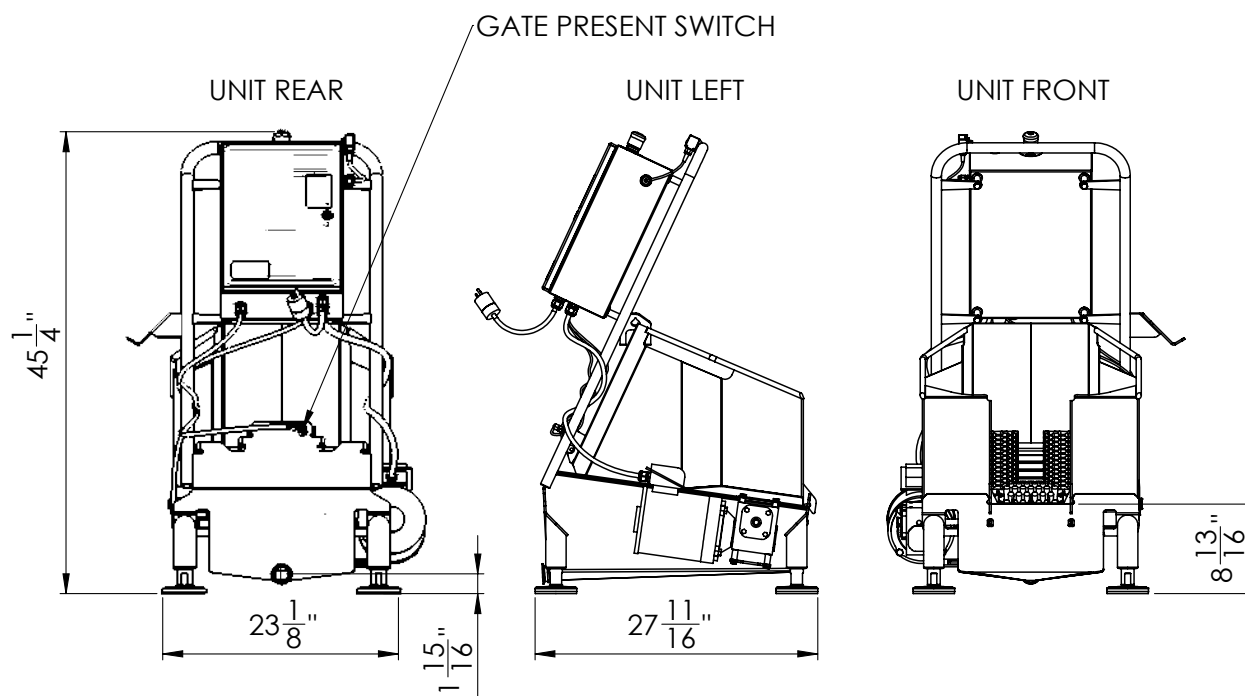
READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT



Installation



NOTE: For fixed installations, area in front of electrical panel must be clear at least 36"



Installation

Physical Set Up:

1. Set unit in desired location.
2. Aspects to consider when deciding on placement:
 - Clearance for general use
 - Location of drain
 - Emergency exit paths or egress
 - Access to control box
 - Connections for water and electricity

NOTE: To move the unit use a pallet jack or a hi-lo to lift from the bottom. Pad the forks to protect the finish.

3. Use a level to make sure the unit is stable and leveled in all directions [Figure 5.1].
4. Connect unit to electrical supply.

Plumbing Connections:

1. Connect water source to solenoid valve fitting inlet (located on the side of the unit). Fitting is 3/8" [Figure 5.2].
2. Connect the solution source to the hose barb of the Venturi Injector (located after water inlet) using 1/4" PVC tubing [Figure 5.2].
3. If necessary, adjust the dilution ratio using the included metering tips and test [Figure 5.3].
 - The smallest metering tip is a yellow tip with a small tube attached [Figure 5.3]. This tube can be trimmed to alter the dilution ratio.
 - Full length capillary tube results in a dilution ratio of **1:670** at 30-50 psi water inlet pressure.
 - To adjust injector, turn the bypass screen clockwise until solution flows at a desired range.

NOTE: For metering tip injection flow rates and other information see page 18.

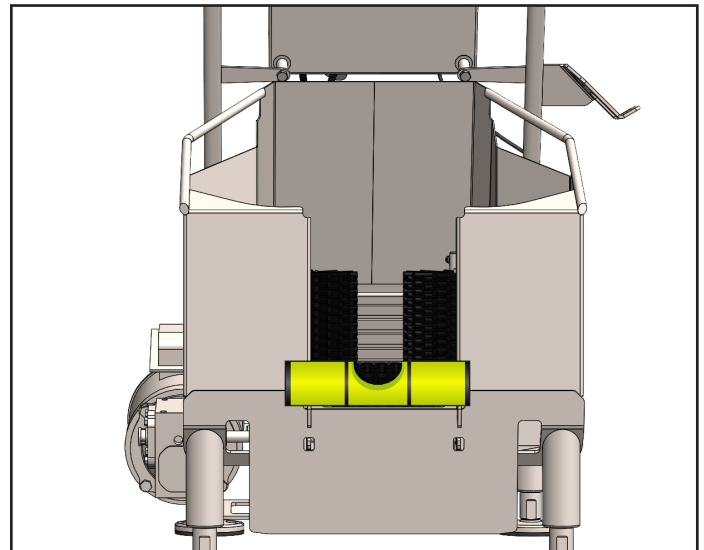


Fig. 5.1: Level and stabilize unit using a leveling device

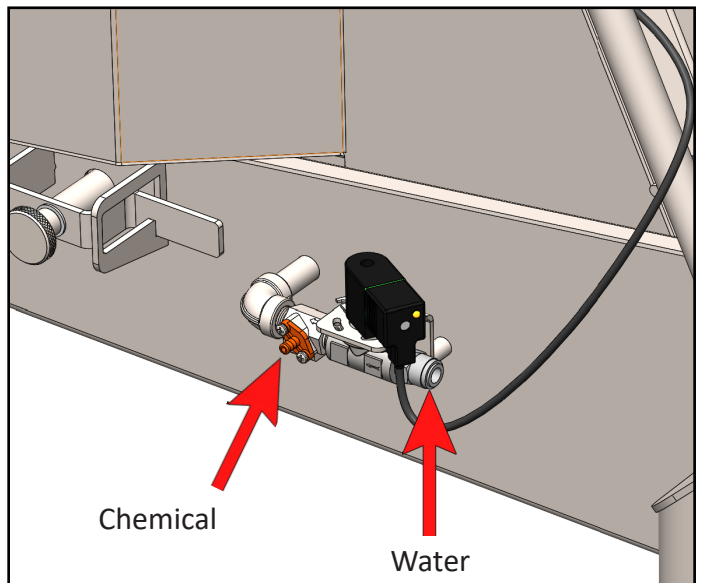


Fig. 5.2: Water and Venturi Injector (solution) inlets

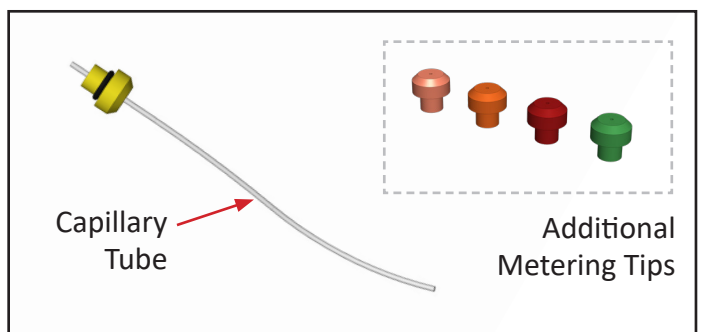


Fig. 5.3: Metering Tips and Capillary Tube

Installation (continued)

Motor Speed Adjustment

The speed of the motor(s) is controlled by the Variable Frequency Drive (VFD). To adjust the speed, turn the knob on the front of the VFD while the unit is under power and motor is running.

Default: 1750 RPM at 45 Hz

- **Recommended speed:** 45 Hz
- **Minimum speed:** 15 Hz
- **Maximum Speed:** 60 Hz

To adjust the speed:

1. Open the control box.



DANGER:

Only qualified personnel should open the control box while under power. NEVER open the control box during washdown or cleaning.

2. Activate the sensor to turn on the motor.
3. As the motor is spinning, the unit will display the operating speed in Hz.
4. Turn the knob counter clockwise to decrease the speed, or clockwise to increase speed. [Figure 6.1]



Fig. 6.1: Delta MS300 (AD GS20) Variable Frequency Drive

Operation

Start Up

1. Verify installation has been completed:
 - Brushes and grate are secured
 - Unit is plugged in and receiving power
 - Water and solution have been plumbed and lines are open
2. Pull the E-STOP switch
3. Press the green Start button to power on - the green indicator light will illuminate when the unit has power [Figure 7.1].

NOTE: Prior to placing footwear into the unit, test that it is working properly by activating the sensor (wave hand in front of sensor).

Use

1. Grasp the handrail with both hands to activate the sensor.
 - Brushes will begin to rotate and the solution/water will spray [Figure 7.2].



CAUTION:

When operating: always ensure solid footing and use handrail for stability.

2. While maintaining grip on the handrail, lift and place one boot in between the side brushes - allowing the rotating brushes to clean the side walls and bottom. Move the foot as necessary to make contact with all areas of footwear.
3. Repeat with other foot/shoe/boot.
4. Remove hands from sensor to stop brush rotation and spray system.

Shut Down

- Press the red E-STOP button on the control box.
- Disconnect power and follow lockout-tagout procedures as necessary.

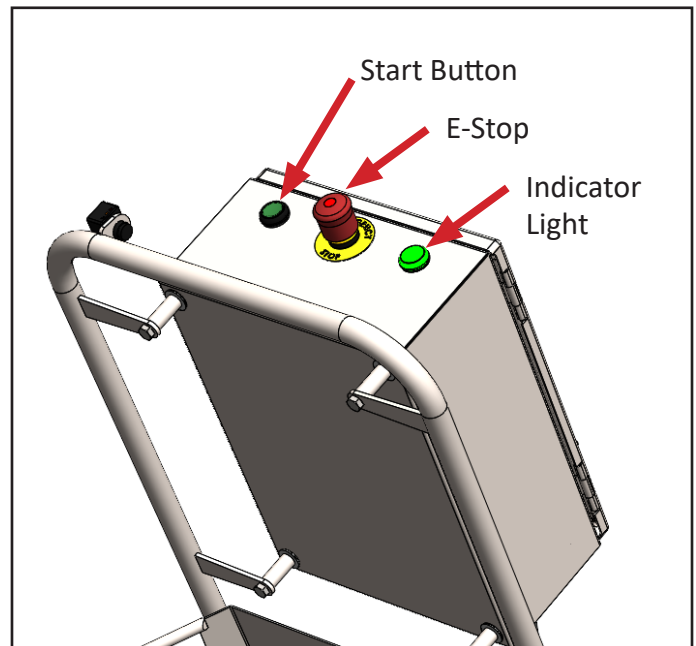


Fig. 7.1: E-stop, start button, and power indicator light

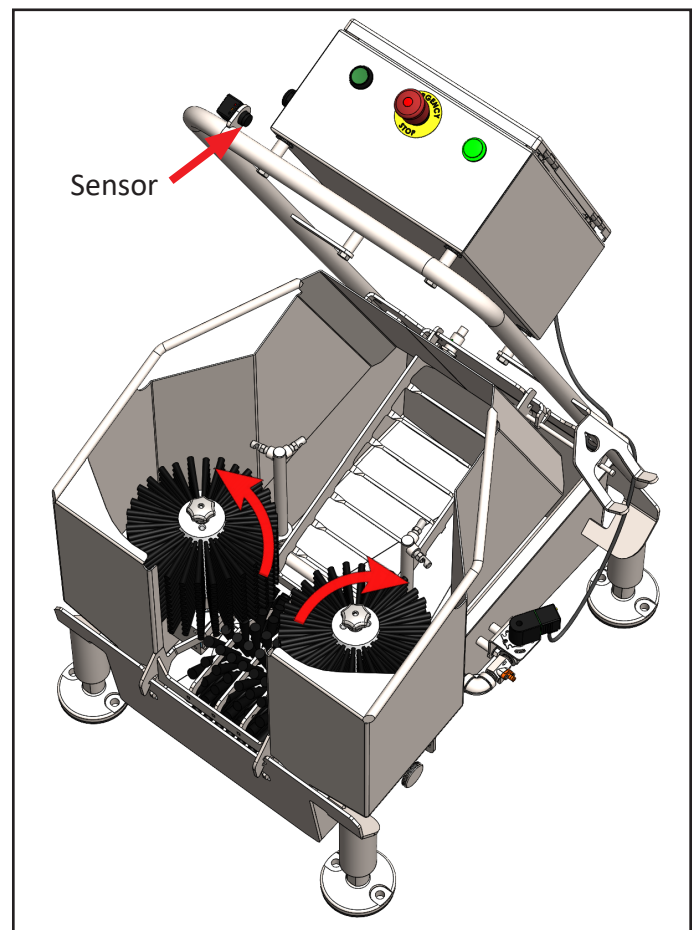
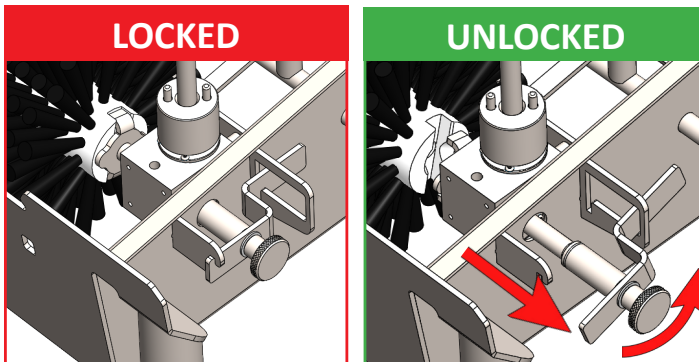


Fig. 7.2: Sensor location and brush rotation

Cleaning Procedures

Removing Grate & Brushes

1. Shut down the unit (see pg. 7).
2. Remove the two vertical brushes by unscrewing the knobs at the top of each brush and lifting them up and off of their shafts [Figure 8.1].
3. Pull back the grate spring bar at the front of the unit, to release the grate [Figure 8.2].
4. Grab the grate using the handles on either side.
5. Lift the grate back and up to remove it from the main tub.
6. Release the sole brush anchor by turning the lock counter clockwise and pulling lever out, away from the tub. The lever is located on the side of the tub as shown below:



7. Lift the sole brush out of the tub by grabbing the open end and lifting up to clear the opposing drive shaft anchor [Figure 8.3].
8. Brushes can be washed individually in a COP tank or wash machine.

NOTE: It is *NOT* recommended to use hot water (over 120°F) to clean brushes.

9. The tub and grate can be washed by conventional means (see material specifications for cleaning solution compatibility, pg 3).

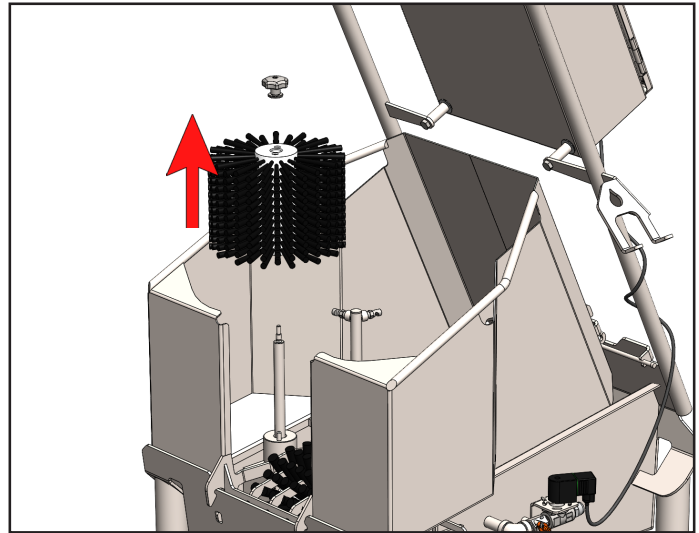


Fig. 8.1: Removing vertical brushes

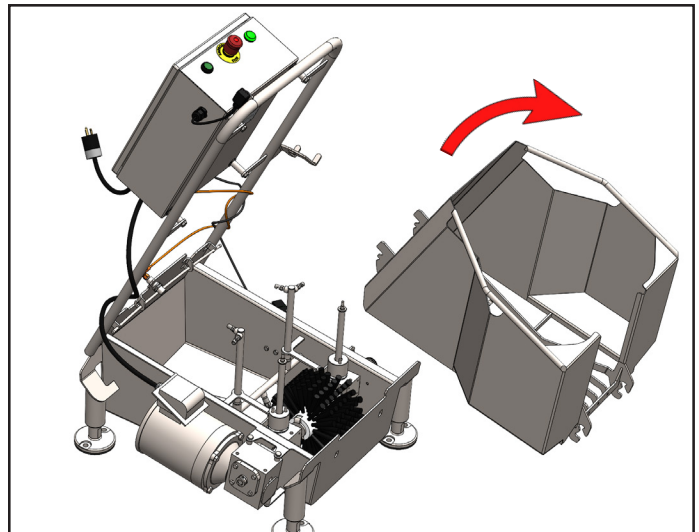


Fig. 8.2: Removing grate

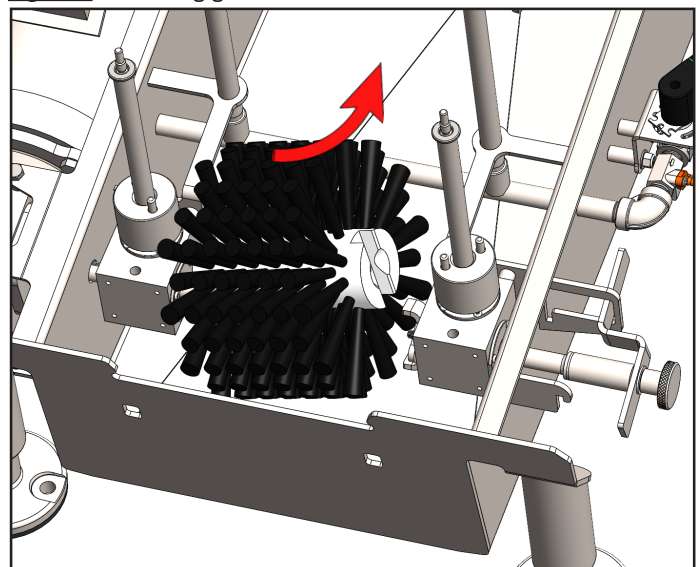


Fig. 8.3: Removing sole brush

Advanced Configuration Options

Motor Current Sensor

Automation Direct ACS-200 Current Switch

The motor current sensor monitors the current draw of the motor and will stop the motor if an over-torque condition occurs.

⚠ DANGER:

Do not open control box during wash down or cleaning. Only authorized personnel should open the control box.

To adjust the Set-Point:

1. 1-6A Setting (Jumper Removed)
2. Two loops of wire through sensor.
3. Turn trimpot counterclockwise at least 5 turns.
4. Turn trimpot clockwise for 3-1/2 turns.
5. Test and adjust accordingly in 1/8 turn increments.

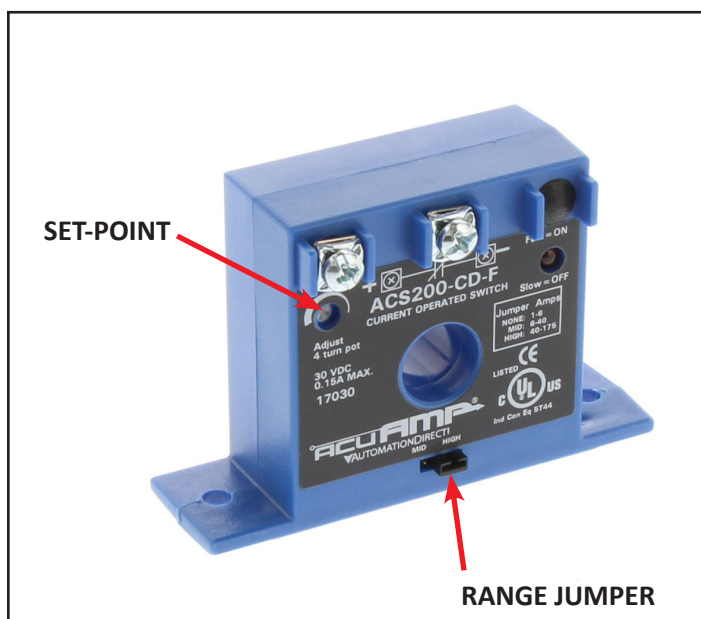


Fig. 9.1: Current Sensor Settings Identification

Brush RPM Formula:

The formula for calculating Speed in RPM from Drive Frequency in Hertz is:

$$\frac{[\text{Motor Nameplate RPM}] \times [\text{Drive Frequency (Hz)}]}{[\text{Motor Nameplate Frequency (Hz)}] \div [\text{Gear Reduction}]}$$

Example:

- Motor Nameplate RPM = **1750**
 - Motor Nameplate Frequency (Hz) = **60**
 - Gear Reduction = **20**
 - Drive Frequency (Hz) = **48**
- $$1750 \times 48 \div 60 \div 20 = \underline{70 \text{ RPM}}$$

The formula for calculating Drive Frequency in Hertz from Desired Speed in RPM is:

$$\frac{[\text{Desired Speed RPM}] \times [\text{Gear Reduction}] \times [\text{Motor Nameplate Frequency (Hz)}]}{[\text{Motor Nameplate RPM}]}$$

Example:

- Desired Speed in RPM = **70**
 - Gear Reduction = **20**
 - Motor Nameplate Frequency (Hz) = **60**
 - Motor Nameplate RPM = **1750**
- $$70 \times 20 \times 60 \div 1750 = \underline{48 \text{ Hz}}$$

Advanced Configuration Options (continued)

Drive Parameter Settings

Delta MS300 (AD GS20) Variable Frequency Drive

PARAMETER NUMBER	DESCRIPTION	115V SETTING	230V SETTING
00-04	User Display	2	2
00-17	Carrier frequency	12	4
00-20	Frequency command source	7	7
00-21	Operation command source	1	1
01-02	Output voltage of motor 1	230.0	230.0
01-09	Start-up frequency	15.0	0.5
01-10	Output frequency upper limit	60.00	60.00
01-11	Output frequency lower limit	15.00	15.00
01-12	Acceleration Time 1	1.00	1.00
01-13	Deceleration Time 1	2.00	2.00
02-13	Multi-function output 1	7	7
06-06	Over-torque detection selection	4	4
06-07	Over-torque detection level	90	90
06-08	Over-torque detection time	0.3	0.3

DANGER:

Only qualified personnel should open the control box while under power. NEVER open the control box during washdown or cleaning.

Timing Relay Settings

Eaton TRL04

- **Function:** R (Off Delay)
- **Time Range:** 1.0 sec.

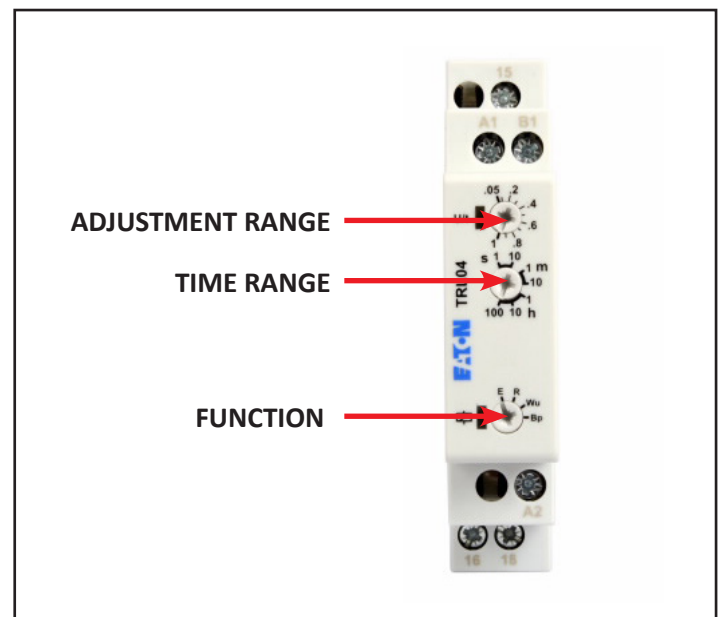


Fig. 10.1 Eaton TRL04 Setting Identification

Preventative Maintenance

The following maintenance procedures are recommended for normal use. Units which see a high amount of use should be inspected more frequently.

Weekly:

- Check unit for proper sensor function and brush rotation.
- Ensure grate is secure and functioning properly.
- Inspect brushes for damage or wear. Check for missing or deformed bristles.
- Inspect electrical cords and plumbing for damage.
- Inspect and test function of emergency stop switches.

Monthly:

- Check all fasteners to ensure they are tight.
- Ensure warning labels and decals are present and in good condition.
- Inspect grate spring assemblies (M1896) and spring balancer bearings (M1904, M1905) for wear
- Inspect motors, gearboxes, and reducers for signs of oil leakage.
- Inspect electrical enclosure for signs of water intrusion.
- Inspect sensors for damage.
- Inspect moving parts for damage or wear.

Quarterly:

- Inspect structure for cracked welds or bent components.

Gear Reducer:

- The gear reducer is supplied filled to capacity with **Mobil Cibus SHC 634 NSF H1 Food Grade** or equal synthetic oil.
 - The synthetic lubrication provided is good for ambient temperatures -10°F - 105°F and is compatible with standard compounded oil.
- Oil should be changed every 2 years (or 6,000 operating hrs.)
- Designed with a bladder type vent system:
 - Consists of an internal bladder that seals the oil chamber from the outside environment at all times - as pressure builds, the bladder contracts keeping the internal pressure to a minimum.
 - Advantage: The internal oil chamber is completely sealed, ensuring oil is not released causing contamination in the application.

Motor:

- Inspect at regular intervals.
- Verify the mounting bolts and couplings to ensure that they are tight and properly adjusted.
- Motor bearings are sealed and not re-greasable.
- Bearings should be replaced approximately every 5 years for 8 hr./day service.

Troubleshooting

Unit not operating & Power Indicator is not Illuminated:

- Verify unit is plugged in.
- Check E-STOP is not pushed down.
- Ensure main power going to the unit.
- Verify circuit breakers in the building have not been tripped.
- Press green activation button.

Unit not operating & Power Indicator is Illuminated:

- Check sensor is operating properly and is connected via orange M12 cable.
- Verify all physical connections to the brushes are in place.
- Restart unit by following shut down and start up procedures (see page 7) - leave shut down for 10 seconds to fully reset.

Unit will not spray:

- Verify water pressure at the inlet to the water (30 psi min.)
- Verify water and solution lines are attached and firmly in place
- Inspect spray nozzles for clogging.
- Verify that the orange LED light on the solenoid valve connector illuminates when the brushes are rotating.

Unit is leaking onto floor:

- Check to make sure all joints are sealed.

Verify water and solution inlets are attached and firmly in place.

Leaner Dilution Ratios Required:

- Verify metering tip is installed in the injector chemical inlet hose barb
- Change the metering tip for a more appropriate size (see pg. 4 for further information)
- If the desired dilution ratio still cannot be achieved pre-dilution of the chemical may be necessary.

Venturi will not draw Chemical Solution:

- Verify water supply is sustaining 30 psi at the injector inlet while unit is running
- Elevate the chemical jug above the injector (a jug hook is provided for this purpose)
- Verify spray nozzles are not clogged. The nozzles supplied with the equipment are rated at 0.2GPM @ 10psi (0.28GPM @ 20 psi)
- Ensure the suction filter is not clogged, kinked or obstructed in any way that would restrict flow.

Troubleshooting

F063 Fault Code "SW OverCurrent" on Variable Frequency Drive:

Cause: The fault occurs when the torque load on any brush exceeds the value set in parameter A486 [Shear Pin 1 Level]. A fault on one drive will prevent the other drives from operating. The solution will stop spraying when a fault occurs.

To solve:

- Press e-stop or unplug the unit to cycle power and clear the fault.
- See "advanced configuration options" to adjust the set point

F004 Fault Code on Variable Frequency Drive:

- If unit is connected to a GFCI, verify its ratings (class, mA restrictions, see recommended GFCI below).
- Verify minimum frequency setting on VFD is set to 15 Hz or greater.
 - **VFD Parameter:** P104 [Minimum Freq.]
 - **Manufacturer Default:** 15 Hz.
- Set the lowest carrier frequency on the VFD (lower carrier = less switching on/off)
 - **VFD Parameter:** P446 [PWM Frequency]
 - **Manufacturer Default:** 4.0 kHz.
 - **Minimum:** 2.0 kHz.

NOTE: Clean Logix recommends Leviton's GFCI protection device [# **GFRBF-W**] for circumstances where the facility's original GFCI plug is not applicable.



More Information?

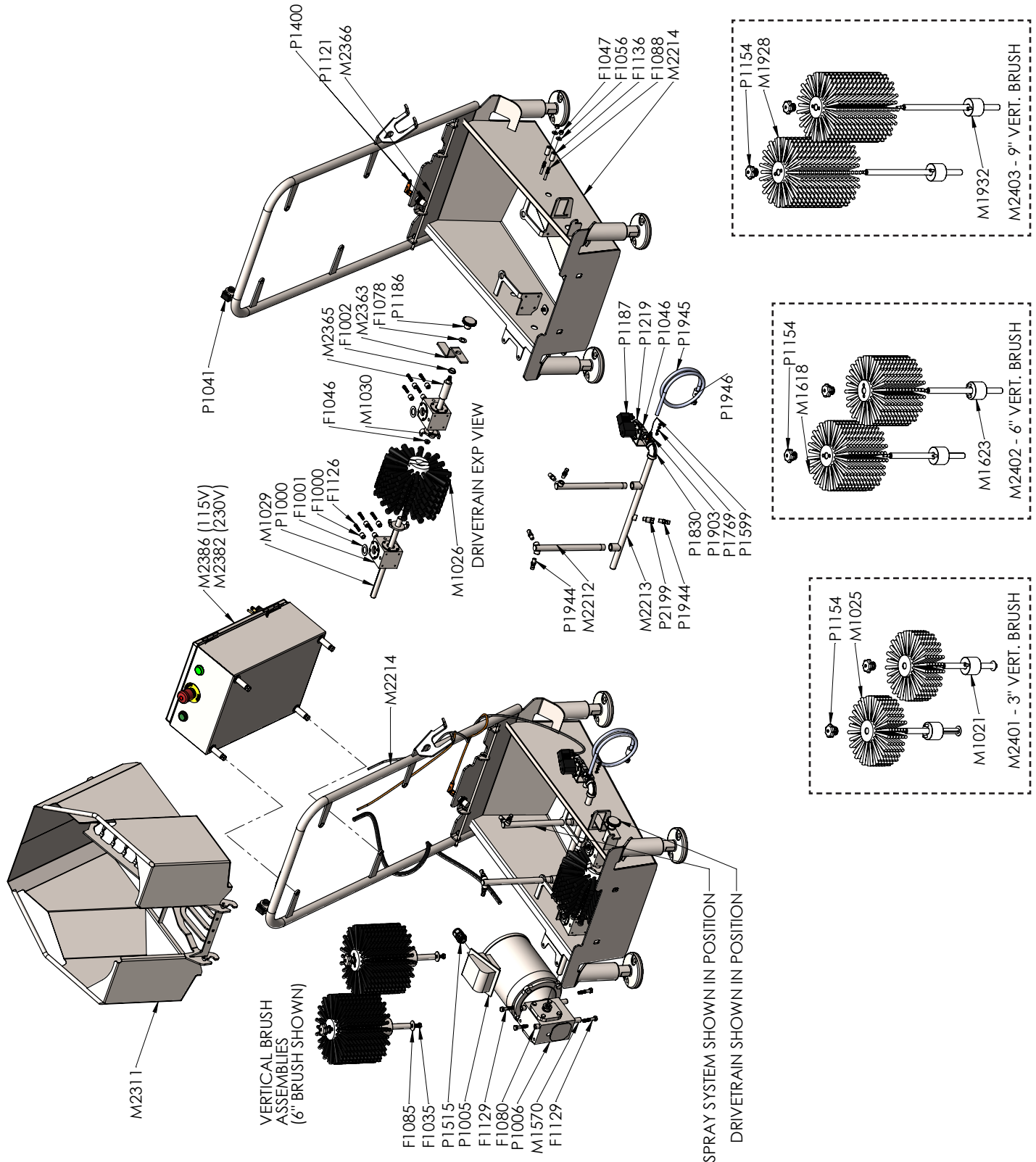
Please contact your equipment representative or manufacturer for further support.

USER MANUAL: BLX-600-GEN2

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Appendix A - Parts Callout : BLX-600



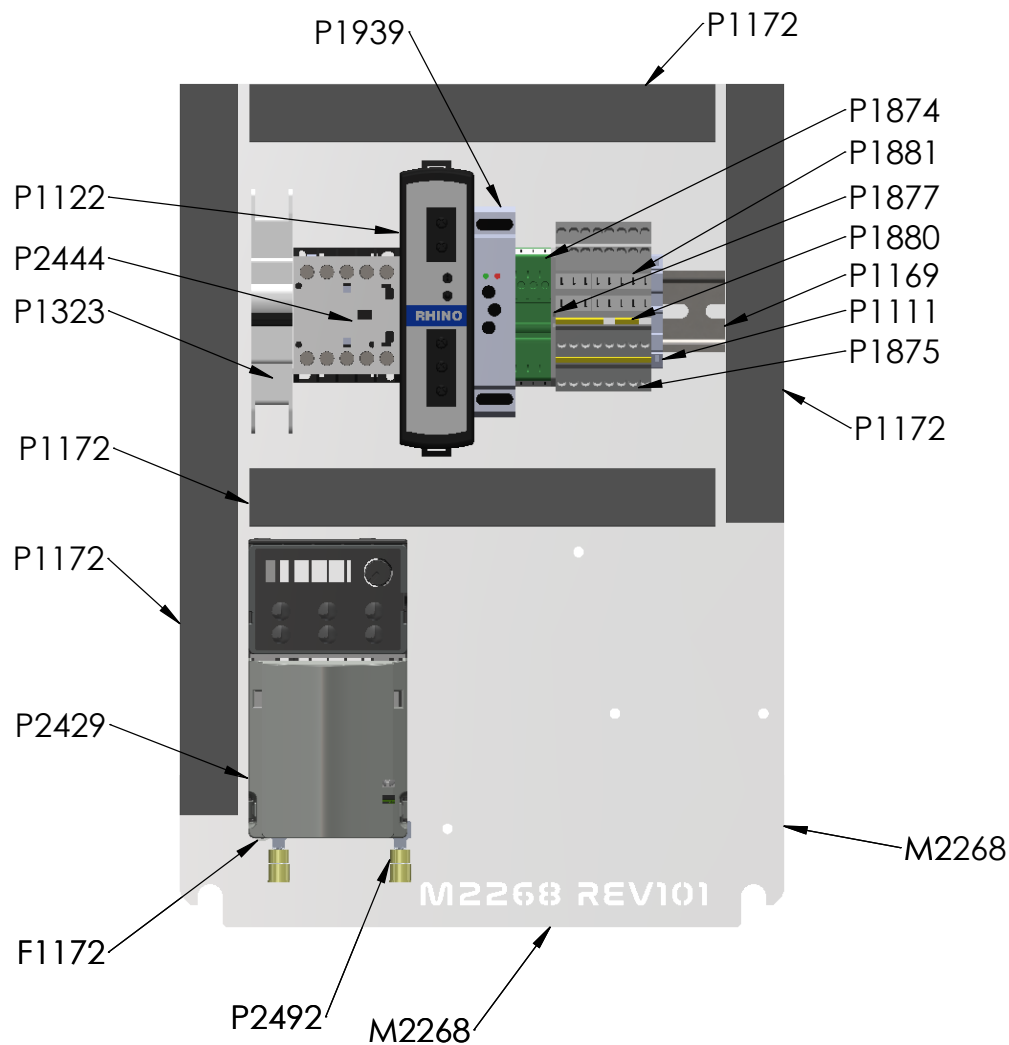
Appendix A - Parts Callout : BLX-600

Part No.	Description
F1000	STANDOFF 1/4 x 1/2 x 1/2 SS
F1001	Washer 3/4" X 1-1/4" X 1/16" PTFE
F1002	BEARING FLANGED 1/2' X 5/8' X 1/4' PTFE
F1046	NUT HEX FLANGED 1/4-20 SS
F1047	NUT NYLOCK 1/4-20 SS
F1056	WASHER 1/4 SS TYPE A
F1078	WASHER .5 X .88 X .06 UHMW
F1088	BOLT HHC 1/4-20 X 1-3/4 SS
F1126	BOLT HHC 10-32 X 1 SS
F1129	BOLT HHC 5/16-18 X 1-1/2 SS
F1136	STANDOFF 1/4 X 1/2 X 1 SS
M1021	BRUSH SHAFT WELDMENT BLX-600
M1025	BRUSH, CYLINDER, 8" DIA. X 3" LONG, BLACK PP FILAMENT
M1026	HORIZONTAL BRUSH BLX-600/800/1000 8" DIAMETER, 6" WIDE
M1027	DRIVE SHAFT 1 WELDMENT BLX-600
M1030	Brush Coupler BLX-600
M1057	BRUSH KNOB WELDMENT FEMALE
M1134	SOLENOID BRACKET
M1570	SPACER 5/16 X 1/2 X 1 SS
M1618	BRUSH VERTICAL CYL 8 X 6
M1623	BRUSH SHAFT WLDMNT V-6
M1928	BRUSH, CYLINDER, 8" DIA. X 9" LONG, BLACK PP FILAMENT
M1932	BRUSH SHAFT WLDMNT V9
M2212	BLX-600 GEN2 V9 SPRAY BAR
M2213	BLX-600 GEN2 SPRAY BAR WELDMENT SOLE V3
M2214	BLX-600 GEN2 TUB WELDMENT
M2311	BLX-600V GEN2 GRATE WELDMENT
M2363	BLX-V SHAFT LATCH V2
M2366	BLX-600 GEN2 SPRING BAR WELDMENT
M2382	BLX-400-600 GEN2 ELECTRICAL ASSEMBLY - 230V-1PH
M2386	BLX-400-600 GEN2 ELECTRICAL ASSEMBLY - 115V-1PH
P1005	STERLING SS MOTOR 1/2HP, 1800 RPM, 230/460/3/60, TENV, 56C FOOTLESS

Part No.	Description
P1006	STERLING GEAR REDUCER 20:1
P1041	Photo Eye, Allen-Bradley 42EF, 24VDC
P1046	VALVE, SOLENOID, 3/8" SS 24VDC DIN COIL, DEMA 463PS.4D
P1121	SENSOR, INDUCTIVE PROXIMITY, 18mm PP 8mm RN 4-Wire DC N.E./M.C. M12 IQ/D Shielded
P1186	KNOB 1-1/2 x 5/16-18 THREADED HOLE SS 60205K68
P1187	SOLENOID CABLE 18MM DIN 24V LED 3M SC18-LS24-3
P1219	QUICK FIT ADAPTER 3/8" NPT x 3/8" TUBE
P1244	LABEL PINCH POINT HAZARD
P1245	LABEL MOVING PARTS
P1247	LABEL BLX NOTICE
P1248	LABEL SLIP HAZARD
P1400	CABLE, M12, 4 POLE, 5m (16.48 ft), RT-ANG FEMALE/AXIAL MALE
P1515	CORD GRIP PG16 X .260-.545 GREY W/NUT
P1599	METERING TIP, CAPILLARY TUBE
P1677	SPLICE TERMINAL 10-16 AWG NATURAL
P1753	Branham SSIAS1101 : 1LHA.625B.625 Right Angle Gear Box
P1769	METERING TIPS, ULTRA LEAN 100-15KU
P1830	PIPE ELBOW 3/8" x 90 304SS
P1903	VENTURI INJECTOR DEMA ROCKET, ORANGE, .070", 1.3GPM@100PSI, SINGLE BARB
P1944	NOZZLE, FAN SPRAY, 110 DEGREE, 1/8 MNPT, 304SS, FLOODJET TYPE K, 0.2 GPM @ 10 PSI (1/8KSS-2)
P1945	VENTURI INJECTOR 1/4" SUCTION LINE AND STRAINER
P1946	VENTURI INJECTOR SUCTION WEIGHT CERAMIC FOR 1/4" TUBE
P2199	CHECK VALVE 1/8"F X 1/8"M 1# SS
P2542	PIPE NIPPLE 3/8" X 3.5" L 304SS

Appendix B - Electrical Panel Parts Callout (115V)

M2376 - BLX-600 GEN2 1150V-1PH

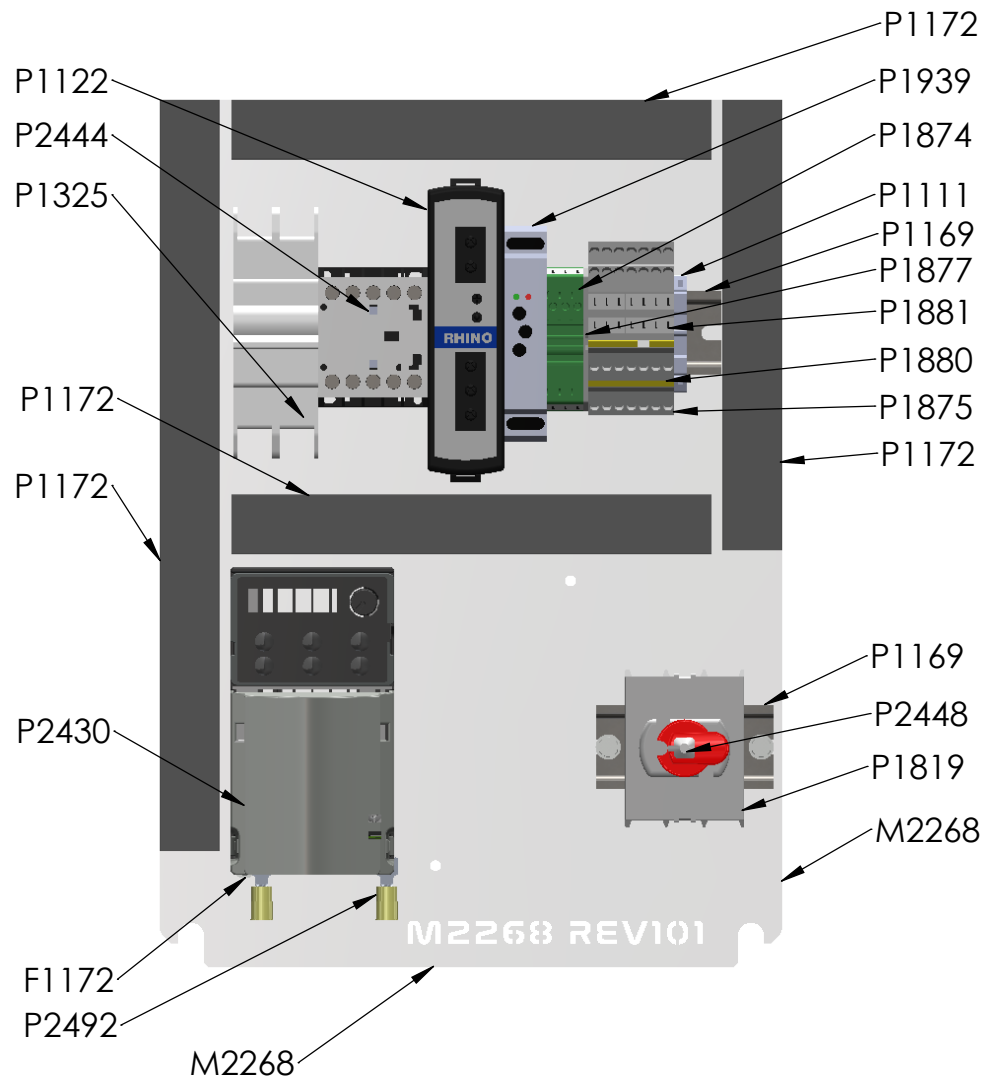


Part No.	Description
F1172	SCREW THEAD FORMING 10-32 X 1/2 HEX WASHER HEAD ZINC
M2268	BACK PANEL CP1612
P1111	END STOP TERMINAL BLOCK
P1122	POWER SUPPLY 24VDC 60W
P1169	DIN RAIL 35mm X 180mm LONG
P1172	WIRE DUCT 25X60 X 188mm LONG
P1323	CIRCUIT BREAKER 10A SINGLE POLE
P1874	TERMINAL BLOCK SPRING CLAMP 5.1mm GROUND
P1875	TERMINAL BLOCK SPRING CLAMP 5.1mm DUAL-LEVEL

Part No.	Description
P1877	TERMINAL BLOCK END BARRIER L3 SERIES
P1880	TERMINAL JUMPER 5.1mm
P1881	TERMINAL BLOCK LABEL 5.1mm NUMBERS 1-10, 20 SETS/CARD
P1939	RELAY, TIMER, MULTIFUNCTION 24VDC
P2429	VARIABLE FREQUENCY DRIVE MS300 0.5HP 115-1PH
P2444	IEC CONTACTOR 3P 16A 24VDC 1 NO AUX CONTACTOR
P2492	TERMINAL, SPADE, 10-12AWG, #10
P2493	TERMINAL, BUTT SPLICE, 10-12AWG, YELLOW

Appendix B - Electrical Panel Parts Callout (230V)

M2372 - BLX-600 GEN2 230V-1PH



Part No.	Description
F1172	SCREW THEAD FORMING 10-32 X 1/2 HEX WASHER HEAD ZINC
M2268	BACK PANEL CP1612
P1111	END STOP TERMINAL BLOCK
P1122	POWER SUPPLY 24VDC 60W
P1169	DIN RAIL 35mm X 180mm LONG
P1172	WIRE DUCT 25X60 X 312mm LONG
P1325	CIRCUIT BREAKER 13A DOUBLE POLE
P1819	DISCONNECT SWITCH 25A 3-POLE
P1874	TERMINAL BLOCK SPRING CLAMP 5.1mm GROUND
P1875	TERMINAL BLOCK SPRING CLAMP 5.1mm DUAL-LEVEL

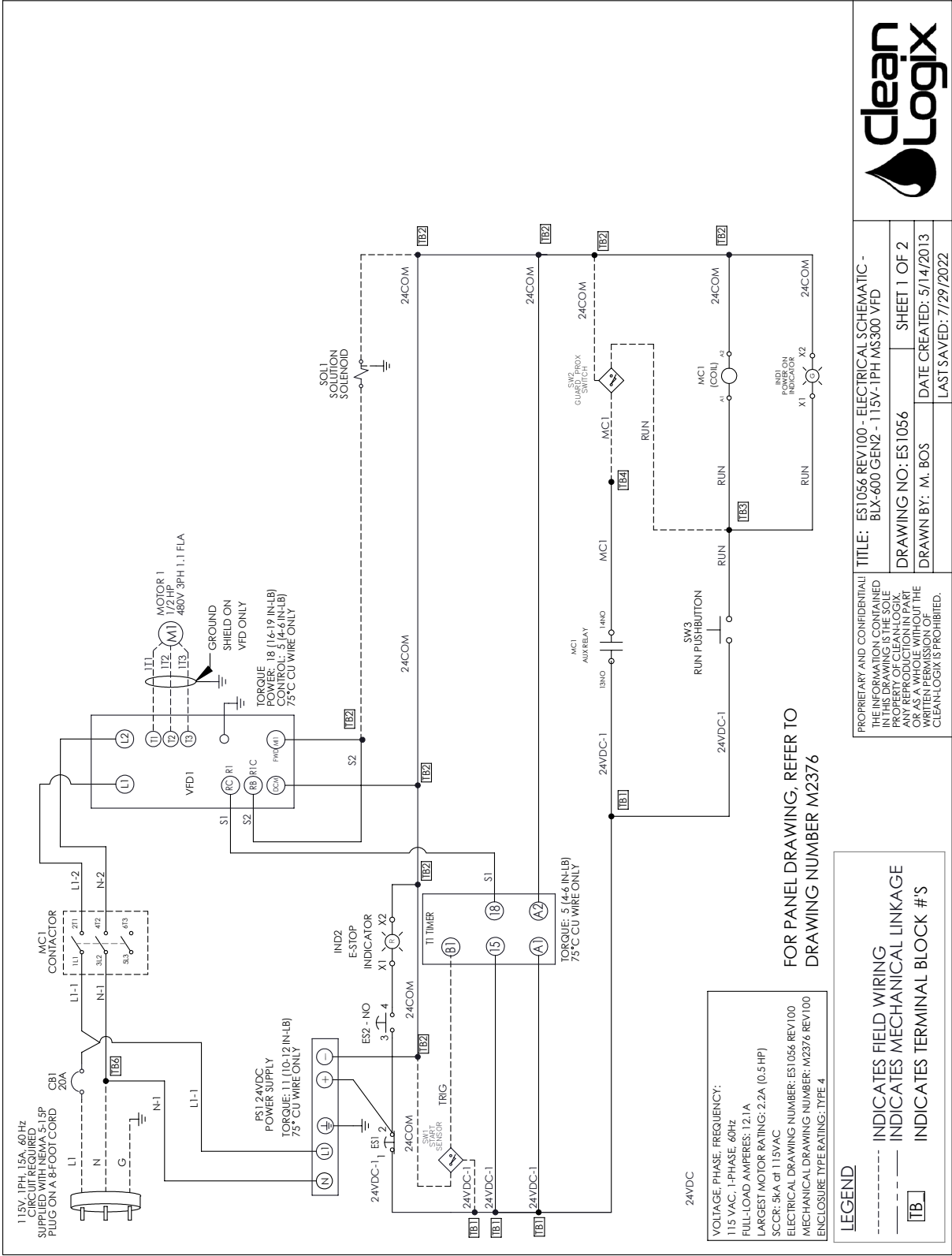
Part No.	Description
P1877	TERMINAL BLOCK END BARRIER L3 SERIES
P1880	TERMINAL JUMPER 5.1mm
P1881	TERMINAL BLOCK LABEL 5.1mm NUMBERS 1-10, 20 SETS/CARD
P1939	RELAY, TIMER, MULTIFUNCTION 24VDC
P2430	VARIABLE FREQUENCY DRIVE MS300 0.5HP 230-1PH
P2444	IEC CONTACTOR 3P 16A 24VDC 1 NO AUX CONTACTOR
P2448	DISCONNECT SWITCH SHAFT ALTECH L200 AD11-ST
P2492	TERMINAL, SPADE, 10-12AWG, #10
P2493	TERMINAL, BUTT SPLICE, 10-12AWG, YELLOW

USER MANUAL: BLX-600-GEN2

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT



Appendix C - Electrical Schematic (115V)



READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT



General

Installation

Operation

Configuration

Maintenance

Troubleshooting

Appendix

