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# USER MANUAL

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MODEL:

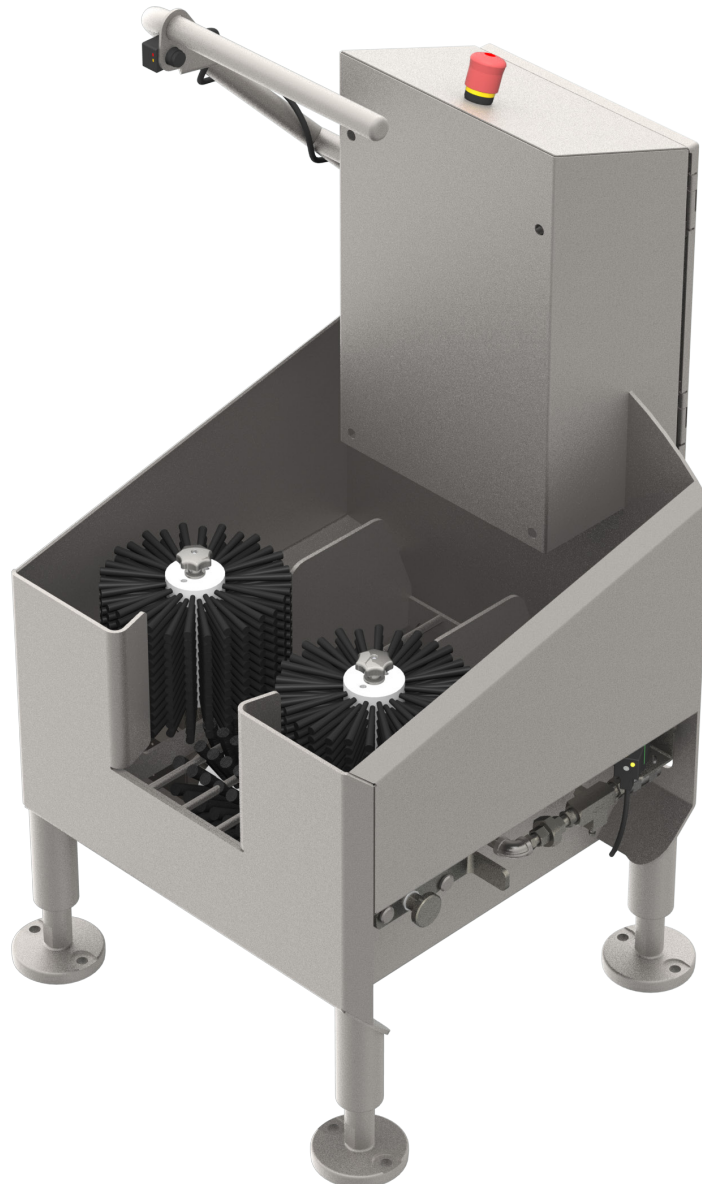
**BLX-600**

**Compact Boot Scrubber**

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*English (Original Instructions)*

*Updated: 02/11/21*



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### **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

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: 167 lb (75.75 kg)
- Dimensions: 24" x 25.5" x 46"  
(66 x 52 x 116.8 cm)
- Water Consumption: 1.5 GPM  
(3.8 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

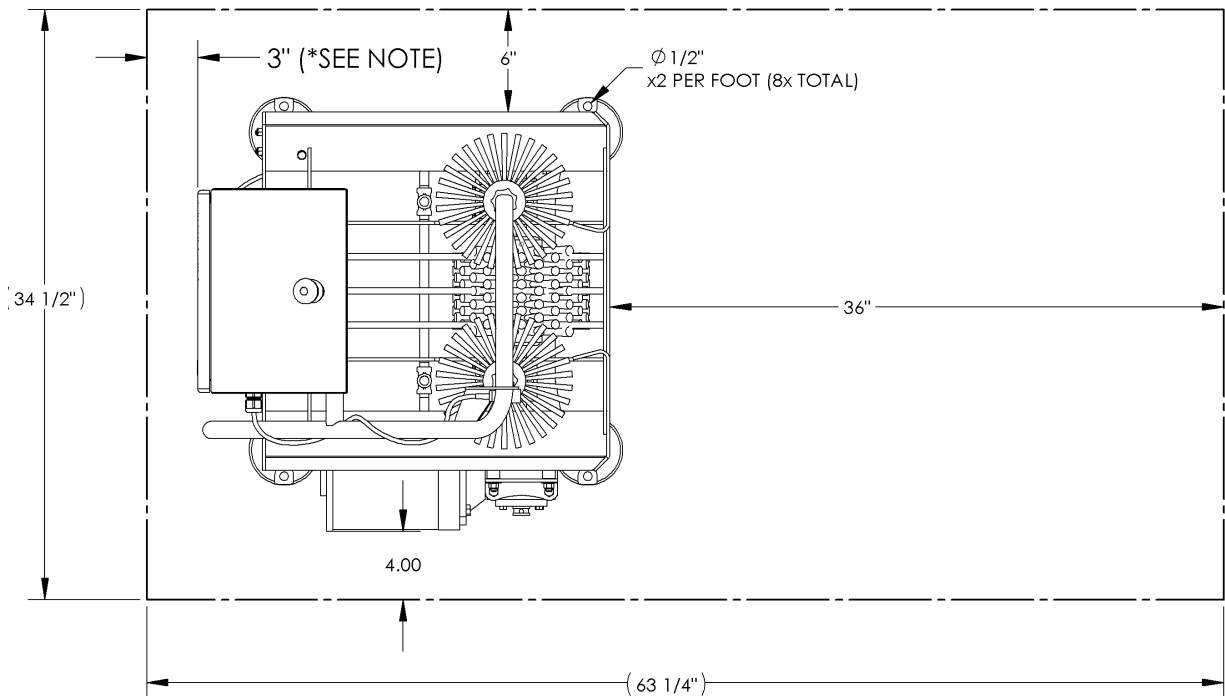
- BLX-600 (120V):**
  - 120 VAC Single Phase
  - 60 Hz 15 Amps
  - Supplied with 8 ft. power cable with NEMA 5-15P plug
- BLX-600 (230V):**
  - 230 VAC Single Phase
  - 60 Hz 15 Amps
  - Supplied with 8 ft. power cable with NEMA 5-15P plug

# USER MANUAL: BLX-600

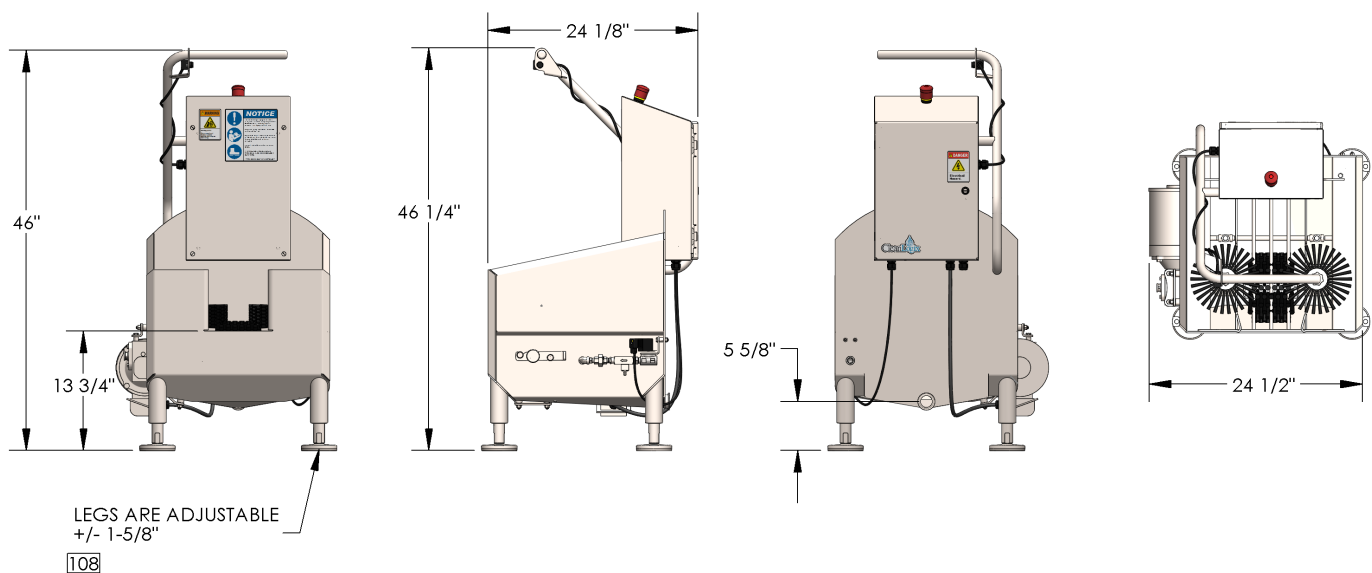
READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT



## 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 approximately **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.

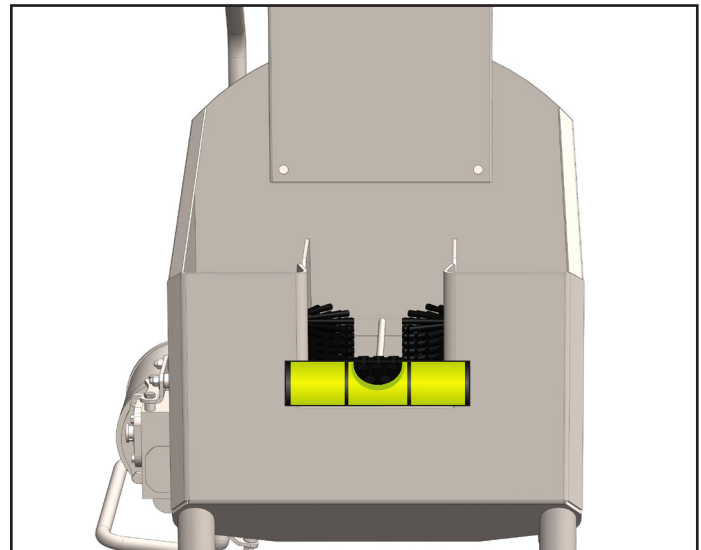


Fig. 5.1: Level and stabilize unit using a leveling device

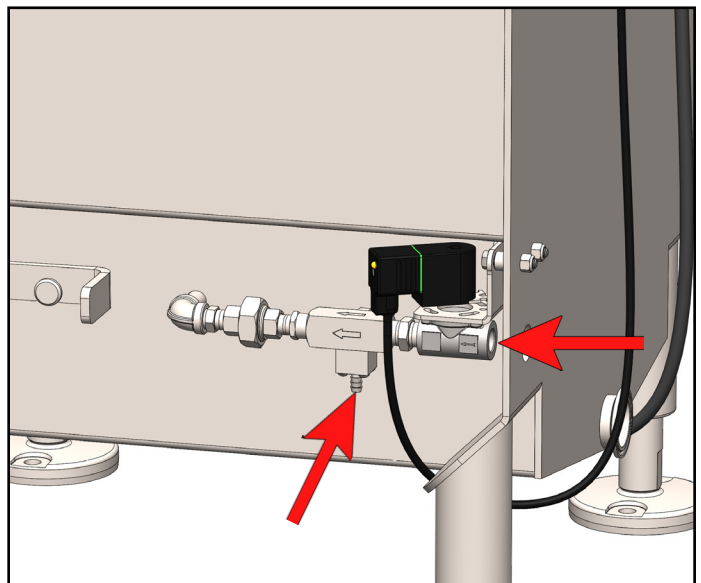


Fig. 5.2: Water and Venturi Injector (solution) inlets

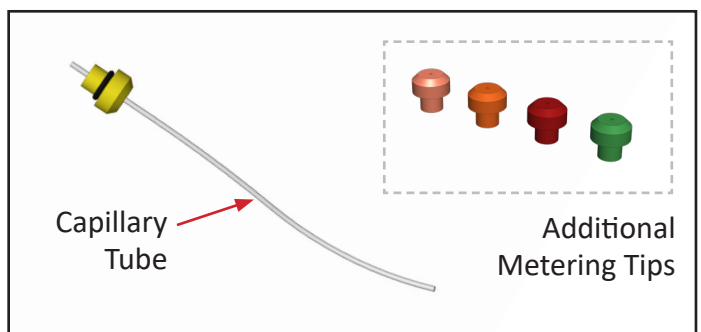


Fig. 5.3: Metering Tips and Capillary Tube

## Installation (continued)

### Motor Speed Adjustment

The speed of the motor is controlled by a variable frequency motor drive. As the drive decreases the frequency of the motor, the RPMs decrease. The V.F. drive displays the Hz. on a small display and the knob next to it adjusts the Hz. The worm gear reducer has a 20:1 ratio.

Default: 1750 RPM at 60 Hz.

To adjust the speed:

1. Open the control box.



#### **DANGER:**

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

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 Hz, therefore decreasing the RPMs. Turning the knob clockwise will increase the RPMs [Figure 6.1]
5. Adjust the Hz. on the variable frequency drive to the desired brush speed. The minimum frequency is 15 Hz and the maximum is 60 Hz Clean Logix recommends 70 RPM/48 Hz.



Fig. 6.1: PowerFlex 4M 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 up to engage power, when illuminated 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. Using both hands, grasp the handrail to activate the sensor.



#### CAUTION:

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

2. When activated, the brush will begin to rotate and the solution/water will spray [Figure 7.2].
3. While maintain grip on the handrail, place one boot in between the side brushes - allowing the rotating brushes to clean by moving the boot to make contact with hard to reach areas.
4. When complete, remove the first boot and repeat with second.
5. Once the user removes their hands the brushes and sanitizer will stop.

### Shut Down

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

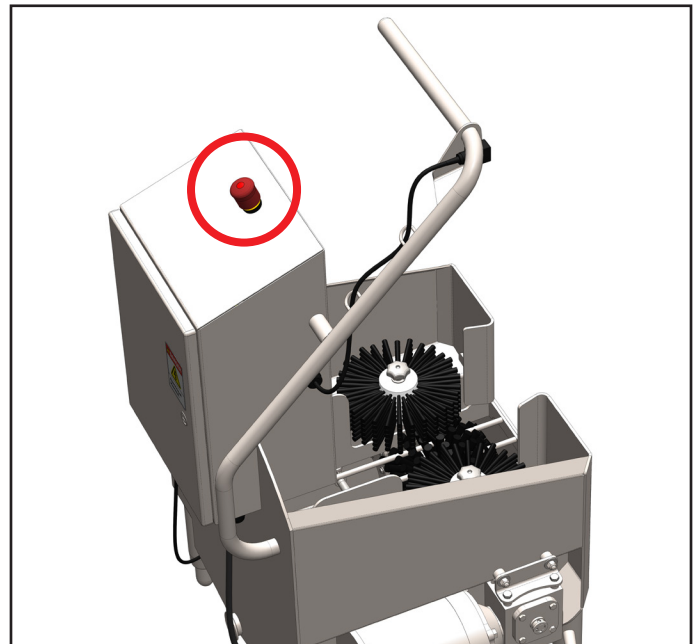


Fig. 7.1: E-Stop illumination

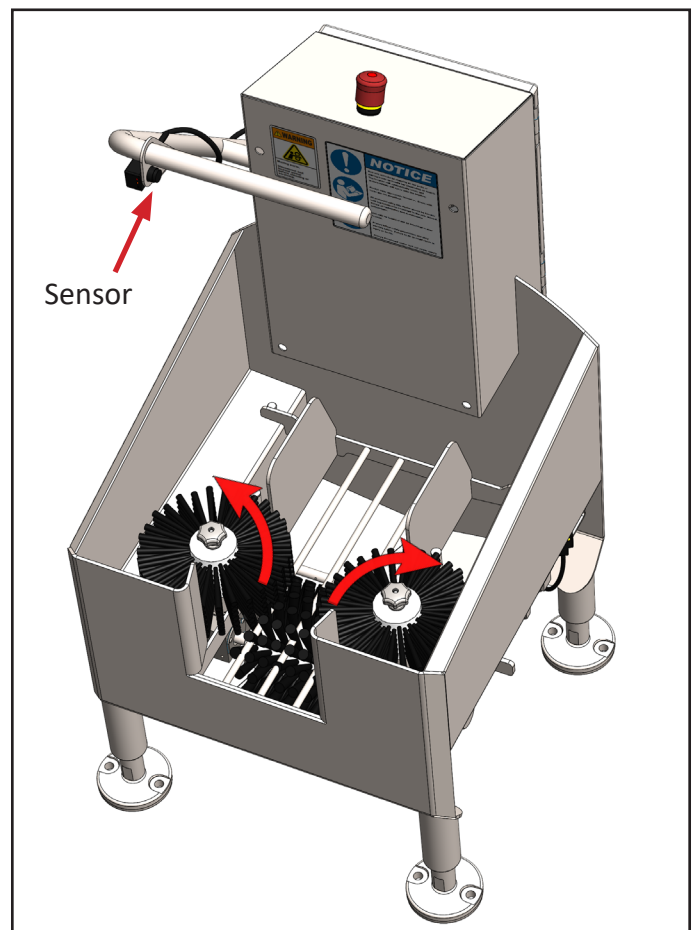
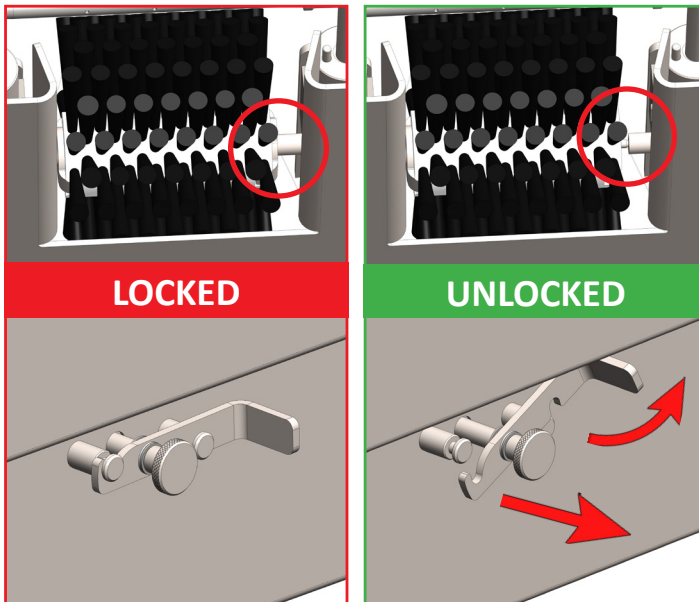


Fig. 7.2: Sensor location and brush rotation

## Cleaning Procedures

### Removing & Replacing 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. Remove the grate by lifting up on the back section, away from its alignment bolts, and pull the entire grate platform up and out of the tub.
4. Release the sole brush anchor by turning and pulling the anchor lever out, away from the tub. The lever is located on the side of the tub as shown below:



5. Lift the sole brush out of the tub by grabbing the open end and lifting up to clear the opposing drive shaft anchor [Figure 8.2].
6. Brushes can be washed individually in a COP tank or wash machine.
7. The tub can be washed by conventional means.

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

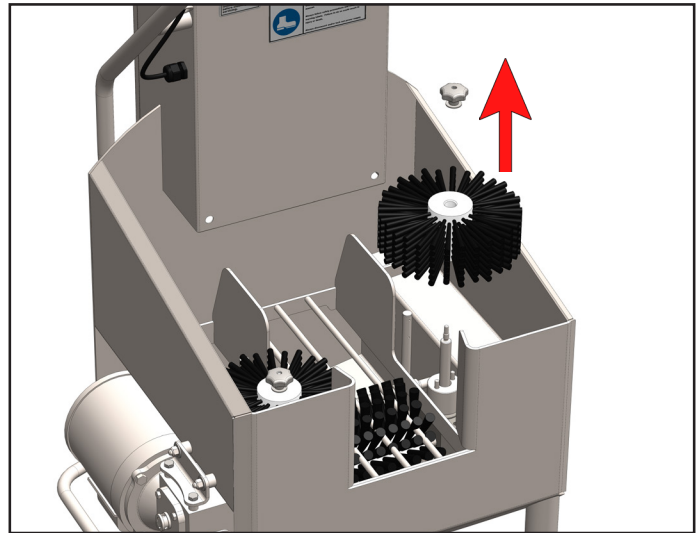


Fig. 8.1: Removing vertical brushes

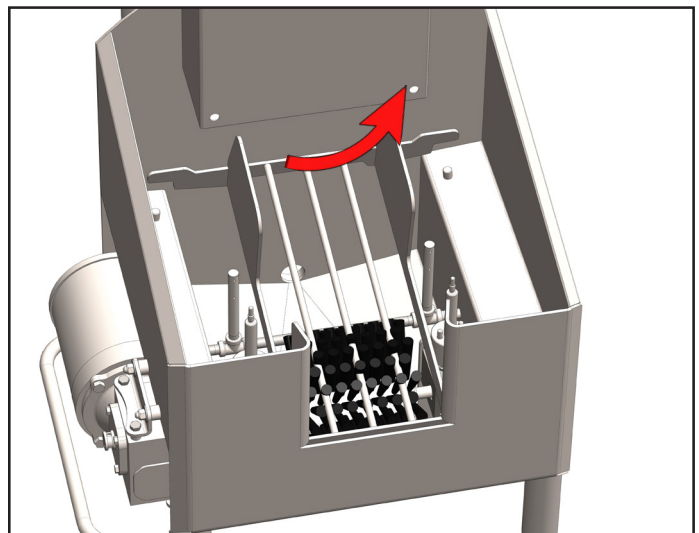


Fig. 8.2: Removing grate

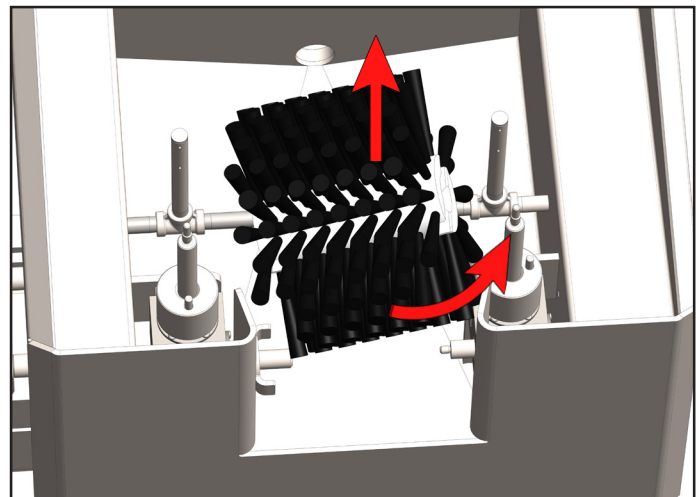


Fig. 8.3: Removing soles brush



## 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.

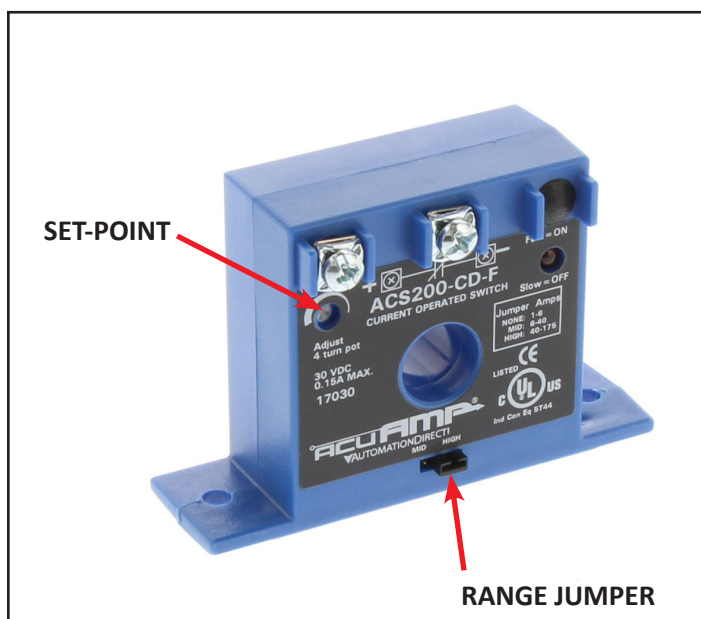


Fig. 9.1: Current Sensor Settings Identification

### 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

#### Allen Bradley 4M Variable Frequency Drive

Parameter Number	Description	Setting	Units
P102	Motor NP Hertz	60	Hz
P104	Minimum Freq	30	Hz
P105	Maximum Freq	60	Hz
P106	Start Source	2	N/A
P109	Accel Time	1	s
P110	Decel Time	2	s
t201	Digital In1 Sel	3	N/A
t221	Relay Out Sel	1	N/A



### **DANGER:**

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

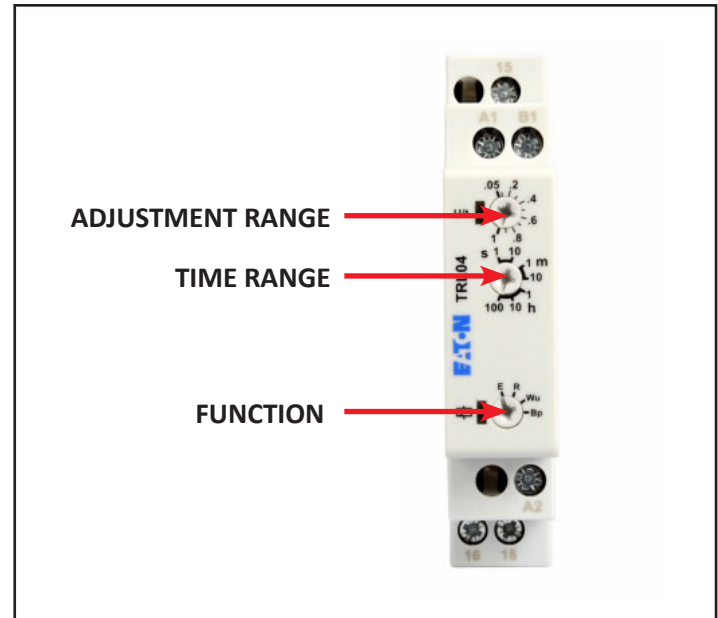


Fig. 10.1: Eaton TRL04 Setting Identification

### Timing Relay Settings

#### Eaton TRL04

- **Function:** R (Off Delay)
- **Time Range:** 1 sec.

#### Schneider Electric Magnecraft

- **Function:** S (Off Delay)
- **Time Range:** 1 sec.

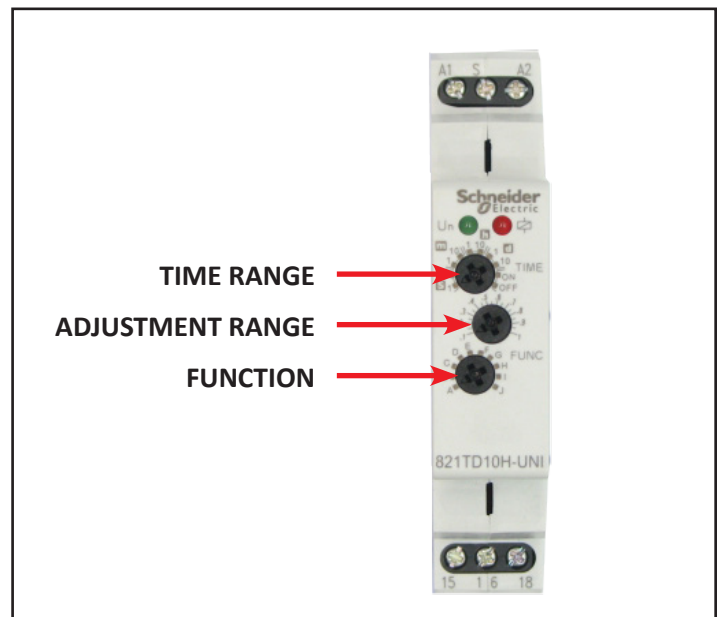


Fig. 10.2: Schneider Magnecraft Setting Identification

## 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 & E-STOP not Illuminated:

- Verify unit is plugged in.
- Verify E-STOP is not pushed down.
- Verify main power going to the unit.
- Verify circuit breakers in the building have not been tripped.

### Unit not operating & E-STOP 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 pushing down the E-STOP, waiting 10 seconds, then turning the unit on again.

### 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

### F002 Fault Code on Variable Frequency Drive:

**Cause:** Power may have been cycled to the unit while it was “ON”. To solve:

1. While power is still applied, turn the unit “off” by pushing down hard on the e-stop button
2. Wait at least 5 seconds, then pull the e-stop button out again. *DO NOT stand on the walkway grate during this process.*
3. The unit should now be ready for use.

**Cause:** If the brushes stop suddenly during normal use and the fault is displayed, the Motor Current Sensor set point may be too low. To solve:

1. Turn the set point adjusting screw clockwise ½ turn to raise the set point and re-test.

### F004 Fault Code on Variable Frequency Drive:

- If unit is connected to a GFCI, verify its ratings (class, mA restrictions, etc.)
- Verify minimum frequency setting on VFD is set between 15 to 20 Hz.
  - **VFD Parameter:** P104 [Minimum Freq.]
  - **Manufacturer Default:** 30 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 GFI protection device [# **GFRBF-W**] for circumstances where the facility's original GFCI plug is not applicable.



### More Information?

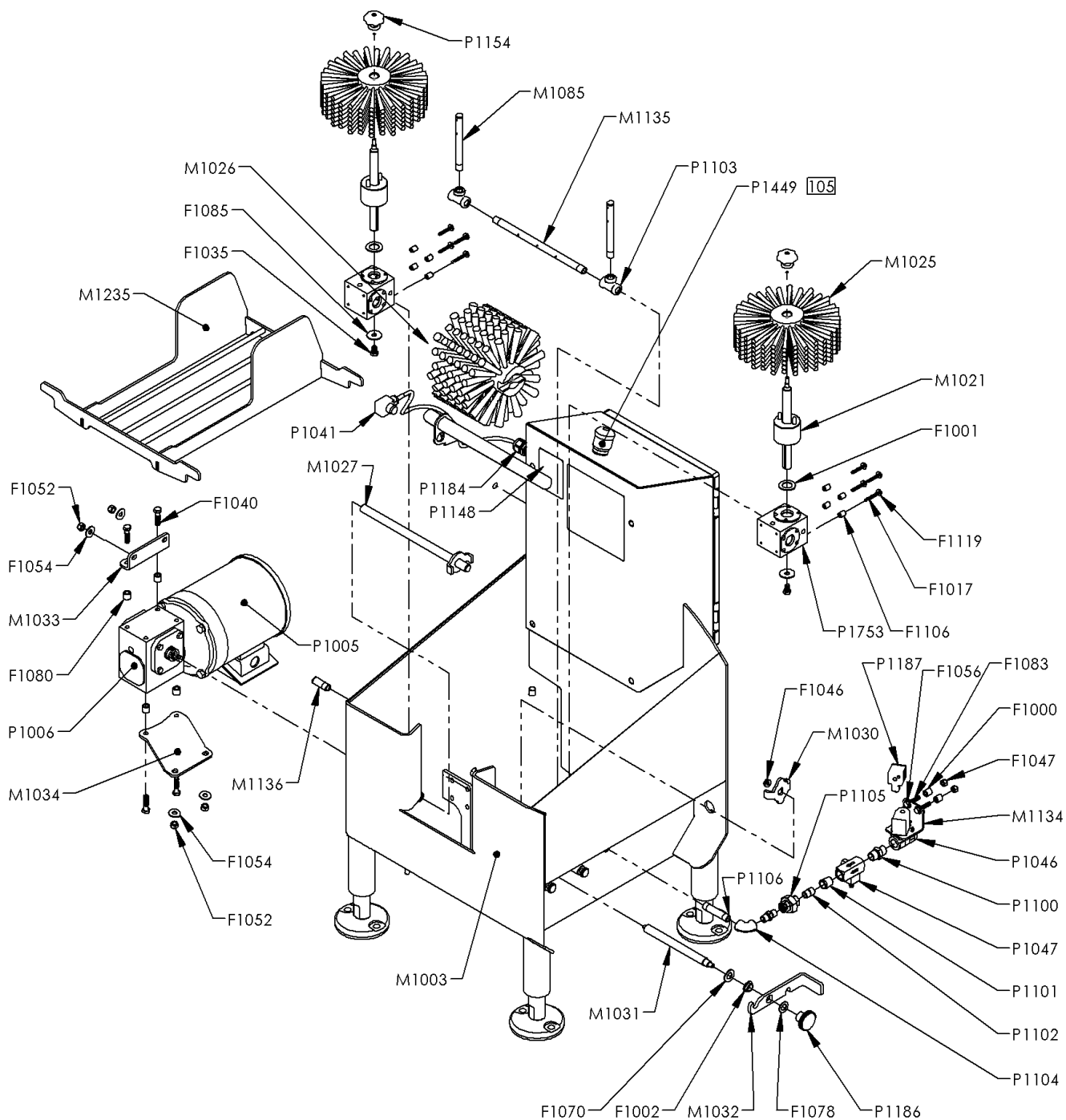
Please contact your equipment representative or manufacturer for further support.

# USER MANUAL: BLX-600

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT



## Appendix A - Parts Callout : BLX-600



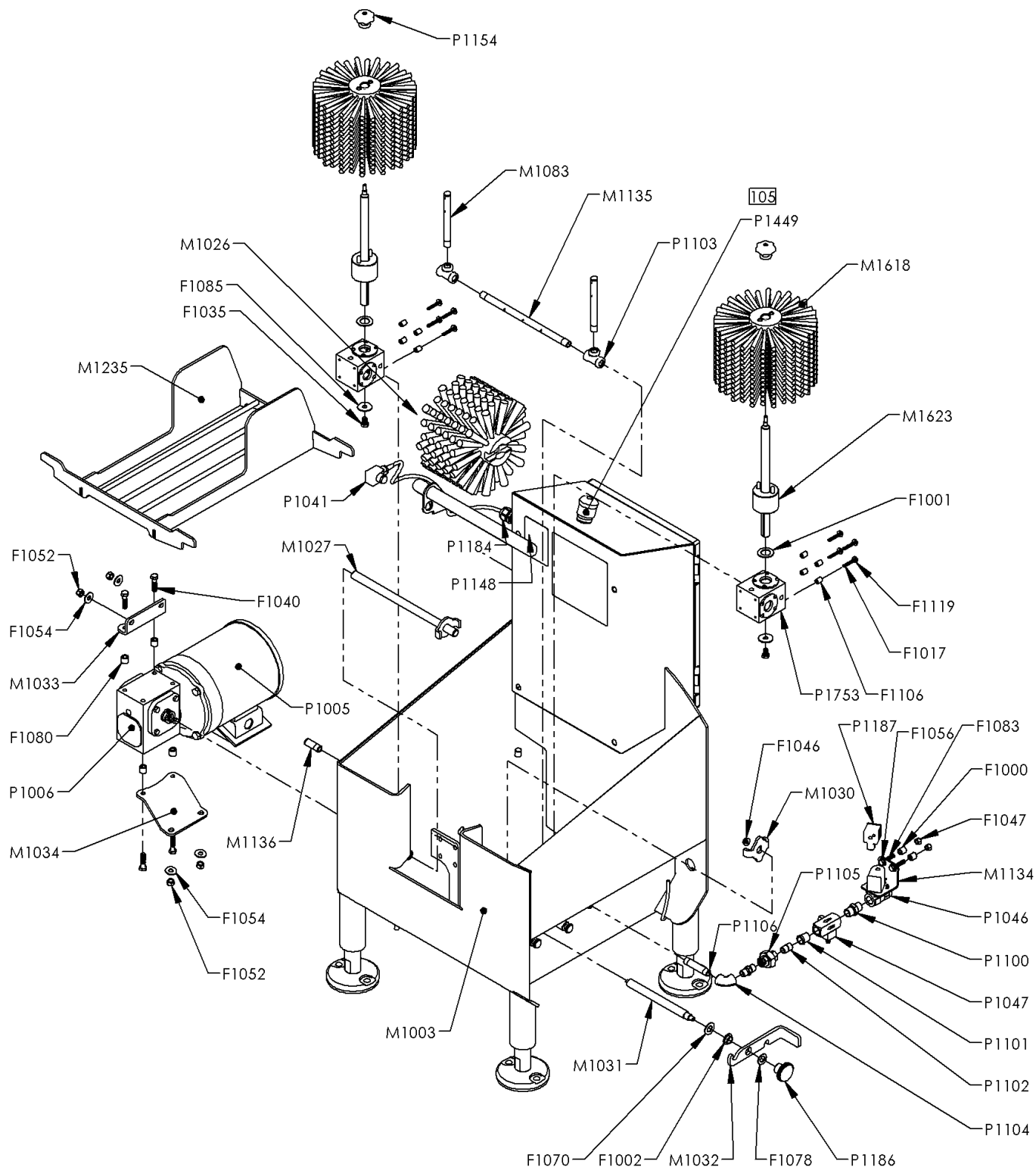


## Appendix A - Parts Callout : BLX-600

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
F1017	BOLT HHC 10-32 x 1 1/4 SS
F1035	BOLT HHC 5/16-18 x 1/2 SS
F1040	BOLT HHC 5/16-18 x 1-1/4 SS
F1046	NUT HEX FLANGED 1/4-20 SS
F1047	NUT NYLOCK 1/4-20 SS
F1052	NUT NYLOCK 5/16-18 SS
F1054	WASHER 5/16 SS
F1056	WASHER 1/4 SS TYPE A
F1070	WASHER THIN 1/2 SS
F1078	WASHER .5 X .88 X .06 UHMW
F1083	BOLT HHC 1/4-20 x 1-1/4 SS
F1085	WASHER FENDER 5/16-18 SS
F1105	BOLT HHC 1/4-20 X 1/2 SS
F1106	STANDOFF #10 X 1/2 X 3/8 O.D. SS
F1119	WASHER 10 SS
M1000	TUB WELDMENT BLX-600-DAF
M1016	GRATE WELDMENT BLX-600
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
M1031	Drive Shaft 2 BLX-600
M1032	Shaft Latch BLX-600
M1033	SS MOTOR MOUNT A
M1034	SS MOTOR MOUNT B
M1057	BRUSH KNOB WELDMENT FEMALE
M1085	VERTICAL SPRAY BAR WELDMENT
M1134	SOLENOID BRACKET
M1135	SPRAY POLE BLX-600
M1136	PIPE SUPPORT POST
M1283	LATCH STUD THREADED
M1924	BLX GEN2 PANEL ASSEMBLY 400-600-800 - 115V
P1000	Right Angle Gear Box, 5/8" Hollow Input & Output Shafts, Right Hand Rotation
P1005	SS MOTOR 1/2HP, 1800 RPM, 230/460/3/60, TENV, 56C FOOTLESS

Part No.	Description
P1006	STERLING GEAR REDUCER 20:1, 56C, HOLLOW QUILL, .625 HOLLOW OUTPUT, 1.33" CENTER DISTANCE,
P1041	Photo Eye, Allen-Bradley 42EF, 24VDC
P1046	VALVE, SOLENOID, 3/8" SS 24VDC DIN COIL, DEMA 463PS.4D
P1047	VENTURI INJECTOR SS BODY & METER KNOB 3/8'
P1100	PIPE HEX NIPPLE 3/8 SS
P1101	PIPE BUSHING 3/8 x 1/4 SS
P1102	PIPE NIPPLE 1/4 CLOSE SS
P1103	PIPE TEE 1/4' NPT SS
P1104	PIPE ELBOW 1/4 x 90 SS
P1105	Pipe Union, Female , 1/4' NPT
P1106	PIPE NIPPLE 1/4 x 2-1/2 SS
P1147	CORD GRIP 1/2 NPT X .170-.450 BLK HEYCO M3231
P1148	CORD GRIP NUT 1/2" NPT BLACK - HEYCO 8463
P1184	CORD GRIP 1/2 NPT X .095-.260 BLK HEYCO M4518
P1186	KNOB 1-1/2 x 5/16-18 THREADED HOLE SS 60205K68
P1187	SOLENOID CABLE 18MM DIN 24V LED 3M SC18-LS24-3
P1188	PIPE HEX NIPPLE 1/4 SS
P1197	WIRE SJOOW 14AWG 4 CONDUCTOR BLACK (0.415 OD) 300V 01364.15T01
P1200	125V 15A 5-15 MALE PLUG
P1242	CRIMP ON TERMINAL, RING 1/4" ID, 14-16 AWG INSULATED
P1449	Push-Pull Pushbutton, Red, 24V Direc Full Voltage, 22mm Mounting, LED, 2NC Contact Block, 12-30VAC/DC Bulb
P1556	CRIMP ON TERMINAL, RING #10, 14-16 AWG INSULATED
P1599	METERING TIP, CAPILLARY TUBE
P1677	SPLICE TERMINAL 10-16 AWG NATURAL
P1753	Right Angle Gear Box, 5/8" Hollow Input & Output Shafts, Left Hand Rotation
P1769	METERING TIPS, ULTRA LEAN 100-15KU
P1828	WIRE, VFD-MOTOR, 14 AWG, 4-CONDUCTOR, SHIELDED, XLPE/PVC
P1934	GREASE, ELECTRIC INSULATING .17OZ ONE TIME USE PACK

## Appendix A - Parts Callout : BLX-600-6



# USER MANUAL: BLX-600

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

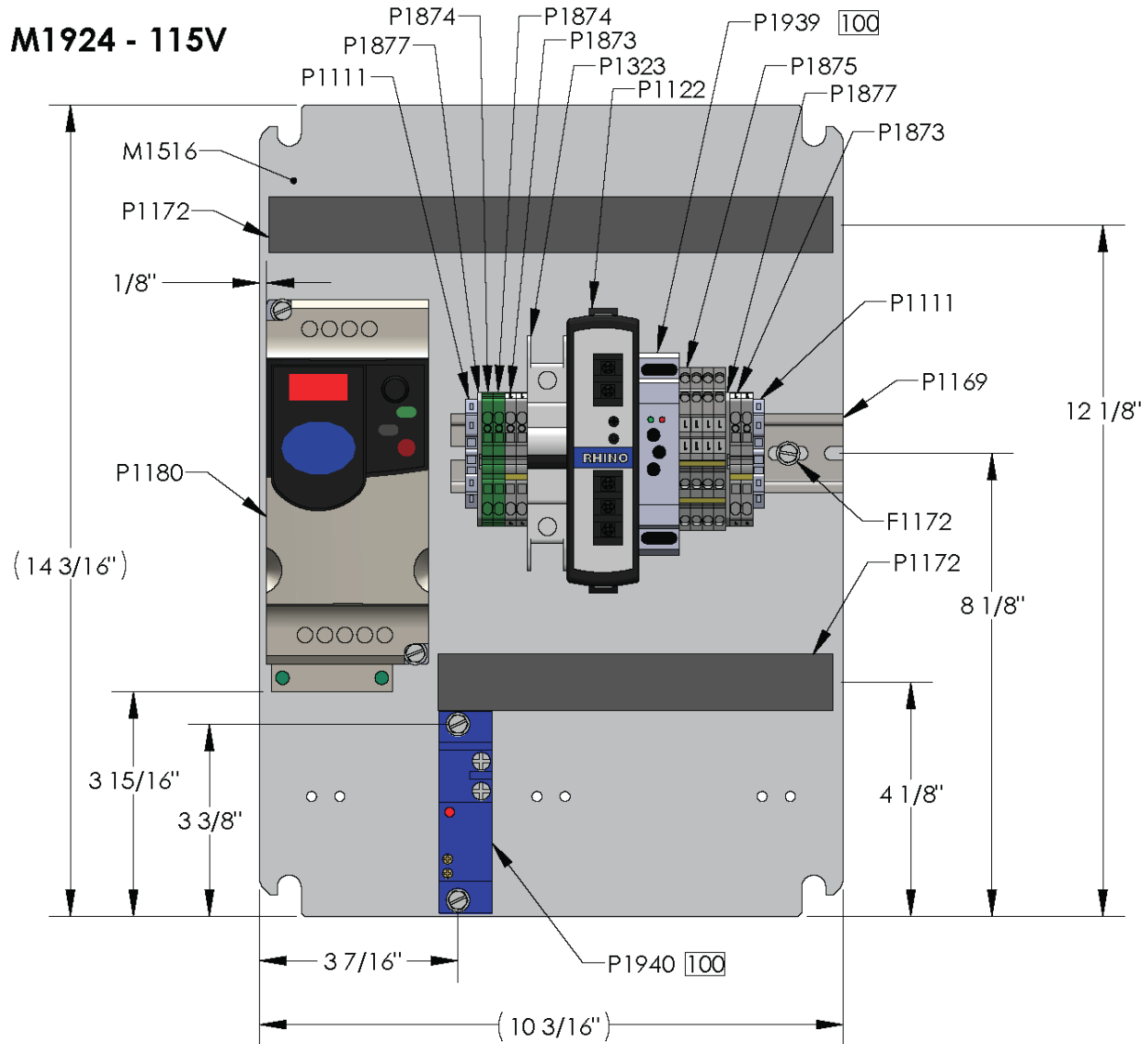


## Appendix A - Parts Callout : BLX-600-6

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
F1017	BOLT HHC 10-32 x 1 1/4 SS
F1035	BOLT HHC 5/16-18 x 1/2 SS
F1040	BOLT HHC 5/16-18 x 1-1/4 SS
F1046	NUT HEX FLANGED 1/4-20 SS
F1047	NUT NYLOCK 1/4-20 SS
F1052	NUT NYLOCK 5/16-18 SS
F1054	WASHER 5/16 SS
F1056	WASHER 1/4 SS TYPE A
F1070	WASHER THIN 1/2 SS
F1078	WASHER .5 X .88 X .06 UHMW
F1083	BOLT HHC 1/4-20 x 1-1/4 SS
F1085	WASHER FENDER 5/16-18 SS
F1105	BOLT HHC 1/4-20 X 1/2 SS
F1106	STANDOFF #10 X 1/2 X 3/8 O.D. SS
F1119	WASHER 10 SS
M1000	TUB WELDMENT BLX-600-DAF
M1016	GRATE WELDMENT BLX-600
M1026	HORIZONTAL BRUSH BLX-600/800/1000 8" DIAMETER, 6" WIDE
M1027	DRIVE SHAFT 1 WELDMENT BLX-600
M1030	Brush Coupler BLX-600
M1031	Drive Shaft 2 BLX-600
M1032	Shaft Latch BLX-600
M1033	SS MOTOR MOUNT A
M1034	SS MOTOR MOUNT B
M1057	BRUSH KNOB WELDMENT FEMALE
M1085	VERTICAL SPRAY BAR WELDMENT
M1134	SOLENOID BRACKET
M1135	SPRAY POLE BLX-600
M1136	PIPE SUPPORT POST
M1283	LATCH STUD THREADED
M1618	BRUSH VERTICAL CYL 8 X 6
M1623	BRUSH SHAFT WLDMNT V-6
M1719	BRUSH SHAFT V-6
M1924	BLX GEN2 PANEL ASSEMBLY 400-600-800 - 115V
P1000	Right Angle Gear Box, 5/8" Hollow Input & Output Shafts, Right Hand Rotation
P1005	SS MOTOR 1/2HP, 1800 RPM, 230/460/3/60, TENV, 56C FOOTLESS

Part No.	Description
P1006	STERLING GEAR REDUCER 20:1, 56C, HOLLOW QUILL, .625 HOLLOW OUTPUT, 1.33" CENTER DISTANCE,
P1041	Photo Eye, Allen-Bradley 42EF, 24VDC
P1046	VALVE, SOLENOID, 3/8" SS 24VDC DIN COIL, DEMA 463PS.4D
P1047	VENTURI INJECTOR SS BODY & METER KNOB 3/8'
P1100	PIPE HEX NIPPLE 3/8 SS
P1101	PIPE BUSHING 3/8 x 1/4 SS
P1102	PIPE NIPPLE 1/4 CLOSE SS
P1103	PIPE TEE 1/4' NPT SS
P1104	PIPE ELBOW 1/4 x 90 SS
P1105	Pipe Union, Female , 1/4' NPT
P1106	PIPE NIPPLE 1/4 x 2-1/2 SS
P1147	CORD GRIP 1/2 NPT X .170-.450 BLK HEYCO M3231
P1148	CORD GRIP NUT 1/2" NPT BLACK - HEYCO 8463
P1184	CORD GRIP 1/2 NPT X .095-.260 BLK HEYCO M4518
P1186	KNOB 1-1/2 x 5/16-18 THREADED HOLE SS 60205K68
P1187	SOLENOID CABLE 18MM DIN 24V LED 3M SC18-LS24-3
P1188	PIPE HEX NIPPLE 1/4 SS
P1197	WIRE SJ00W 14AWG 4 CONDUCTOR BLACK (0.415 OD) 300V 01364.15T01
P1200	125V 15A 5-15 MALE PLUG
P1242	CRIMP ON TERMINAL, RING 1/4" ID, 14-16 AWG INSULATED
P1449	Push-Pull Pushbutton, Red, 24V Direc Full Voltage, 22mm Mounting, LED, 2NC Contact Block, 12-30VAC/DC Bulb
P1556	CRIMP ON TERMINAL, RING #10, 14-16 AWG INSULATED
P1599	METERING TIP, CAPILLARY TUBE
P1677	SPLICE TERMINAL 10-16 AWG NATURAL
P1753	Right Angle Gear Box, 5/8" Hollow Input & Output Shafts, Left Hand Rotation
P1769	METERING TIPS, ULTRA LEAN 100-15KU
P1828	WIRE, VFD-MOTOR, 14 AWG, 4-CONDUCTOR, SHIELDED, XLPE/PVC
P1934	GREASE, ELECTRIC INSULATING .17OZ ONE TIME USE PACK

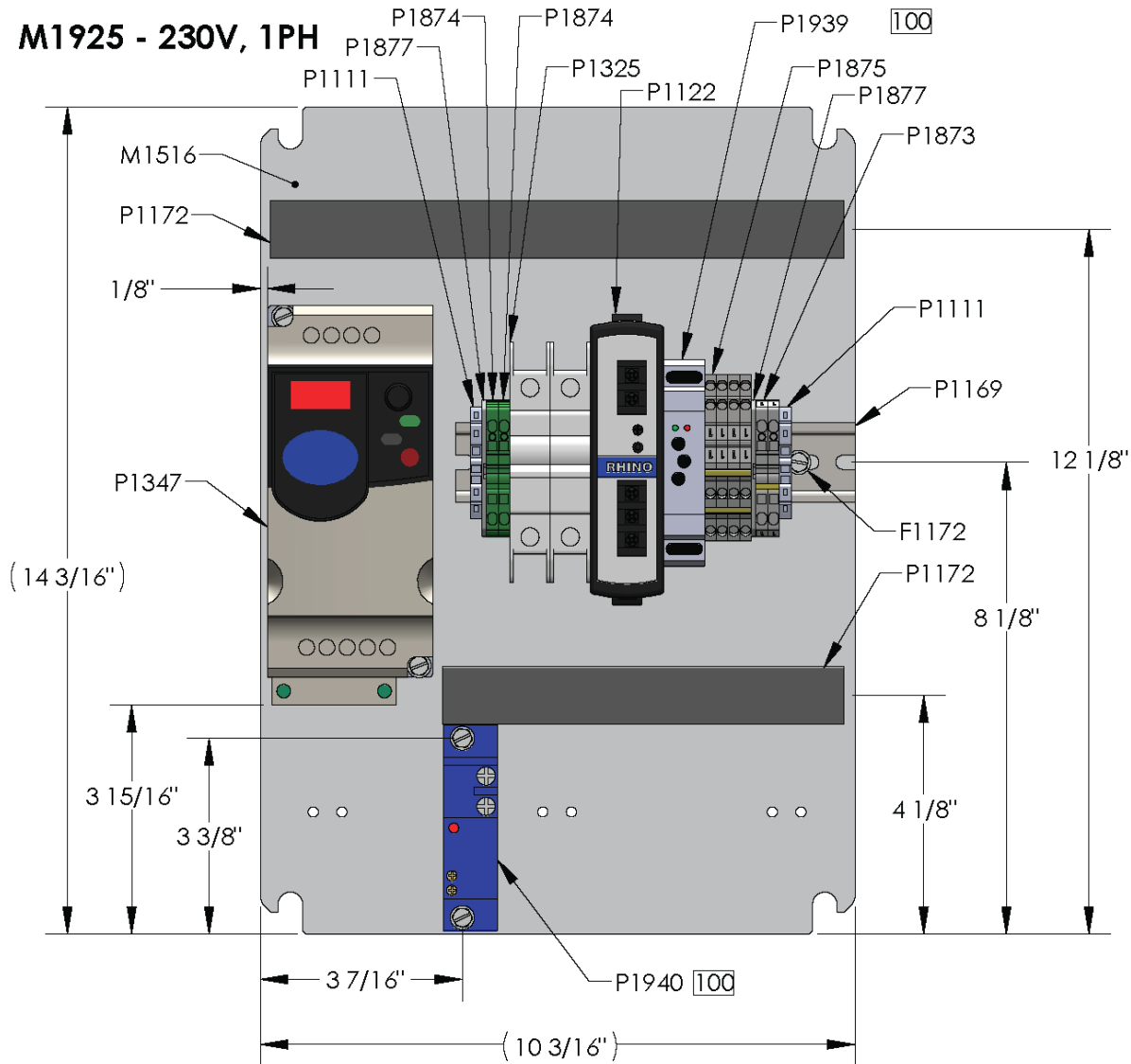
## Appendix B - Electrical Panel Parts Callout



Part No.	Description
F1172	SCREW THREAD FORMING 10-32 X 1/2 HEX WASHER HEAD ZINC
P1111	END STOP TERMINAL BLOCK
P1122	POWER SUPPLY 24VDC 60W
P1180	VARIABLE FREQUENCY DRIVE 0.5HP 120VAC
P1323	CIRCUIT BREAKER 10A SINGLE POLE
P1873	TERMINAL BLOCK SPRING CLAMP 5.1mm GRAY
P1874	TERMINAL BLOCK SPRING CLAMP 5.1mm GROUND

Part No.	Description
P1875	TERMINAL BLOCK SPRING CLAMP 5.1mm DUAL-LEVEL GRAY
P1877	TERMINAL BLOCK END BARRIER L3 SERIES
P1880	TERMINAL JUMPER 5.1mm
P1939	RELAY, TIMER, MULTIFUNCTION 24VDC (REPLACES P1115)
P1940	SWITCH, CURRENT SENSING WITH TIME DELAY, 1-175A ADJUSTABLE, FIXED CORE, NC

## Appendix B - Electrical Panel Parts Callout



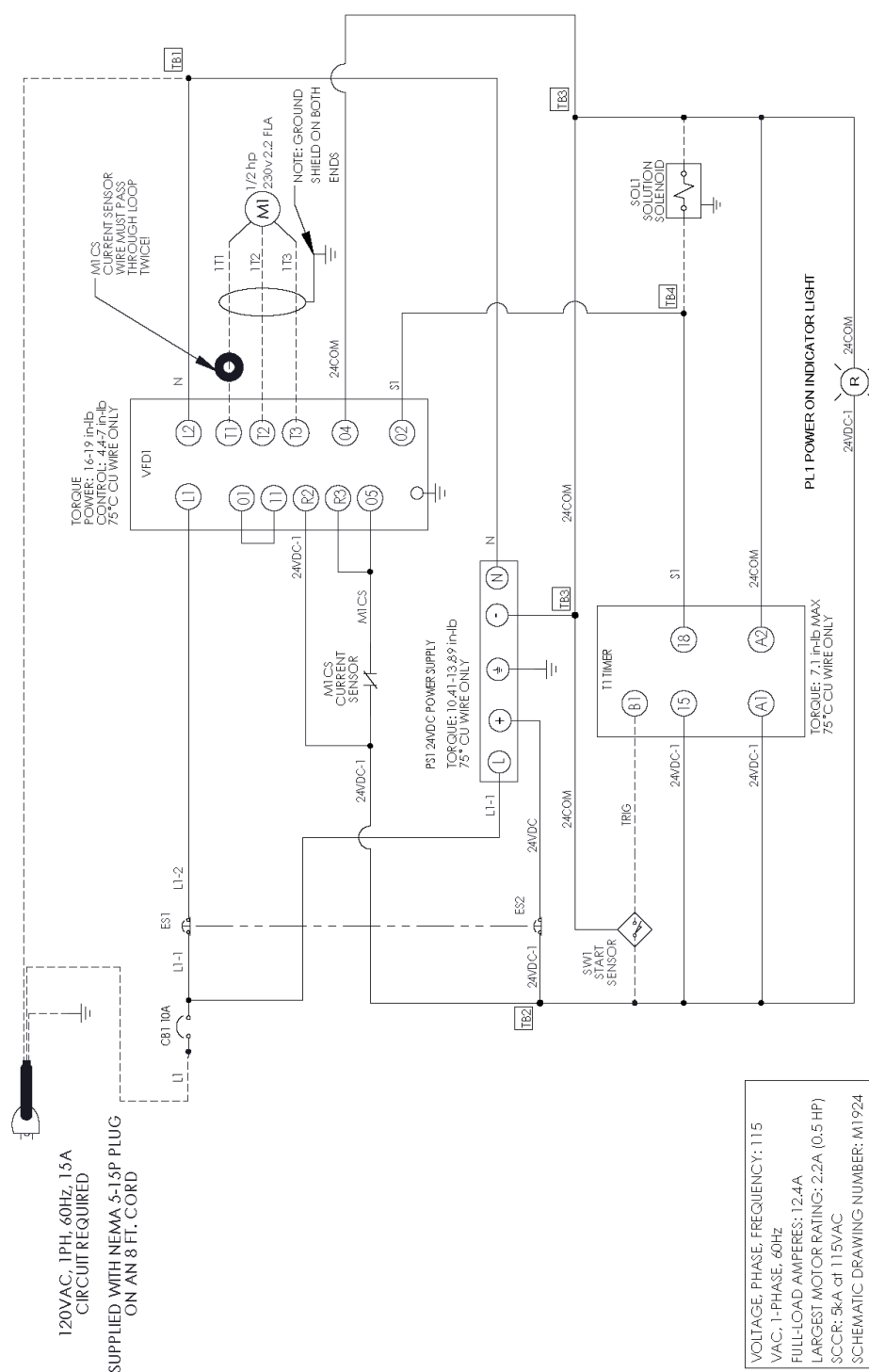
Part No.	Description
F1172	SCREW THREAD FORMING 10-32 X 1/2 HEX WASHER HEAD ZINC
P1111	END STOP TERMINAL BLOCK
P1122	POWER SUPPLY 24VDC 60W
P1325	CIRCUIT BREAKER 13A DOUBLE POLE
P1347	VARIABLE FREQUENCY DRIVE 0.5HP 240VAC
P1873	TERMINAL BLOCK SPRING CLAMP 5.1mm GRAY
P1874	TERMINAL BLOCK SPRING CLAMP 5.1mm GROUND

Part No.	Description
P1875	TERMINAL BLOCK SPRING CLAMP 5.1mm DUAL-LEVEL GRAY
P1877	TERMINAL BLOCK END BARRIER L3 SERIES
P1880	TERMINAL JUMPER 5.1mm - 10 POSITION
P1939	RELAY, TIMER, MULTIFUNCTION 24VDC (REPLACES P1115)
P1940	"SWITCH, CURRENT SENSING WITH TIME DELAY, 1-175A ADJUSTABLE, FIXED CORE, NC"

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT



FOR PANEL DRAWING, REFER TO  
DRAWING NUMBER **M1924**

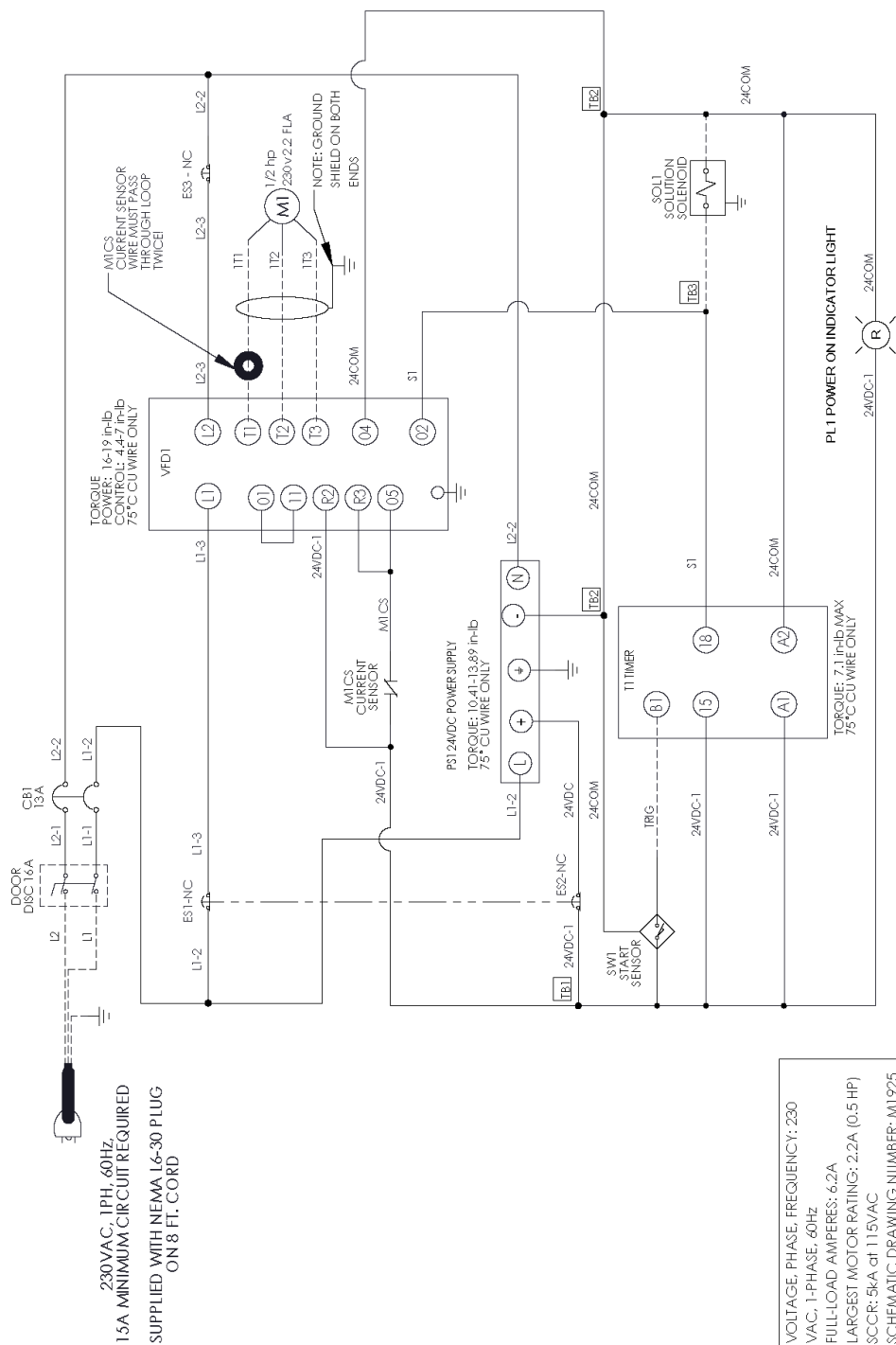


**LEGEND**

----	INDICATES FIELD WIRING
-----	INDICATES MECHANICAL LINKAGE
▢	INDICATES TERMINAL BLOCK #S



Appendix C - Electrical Schematic (230VAC)



## Appendix D - Venturi System Maintenance

### Solenoid & Venturi Injector Maintenance:

1. Shut down the unit (see page 7)
2. Shut OFF the sanitizer supply and remove pressure from the line.
3. Using small phillips screwdriver, remove the set-screw connection from the solenoid to the control box.
4. Using a 7/16" socket wrench, remove the bolts/nuts holding the solenoid bracket to the unit.
5. Pull the assembly away from the unit and unscrew the Venturi injector and solenoid assembly from the spray bars.
6. Unscrew the Venturi injector from the 3/8" pipe nipple.
7. Take a 1/4" socket wrench and remove the solenoid from the solenoid bracket. The insides of the solenoid and Venturi can now be accessed and cleaned to remove any debris or residue.

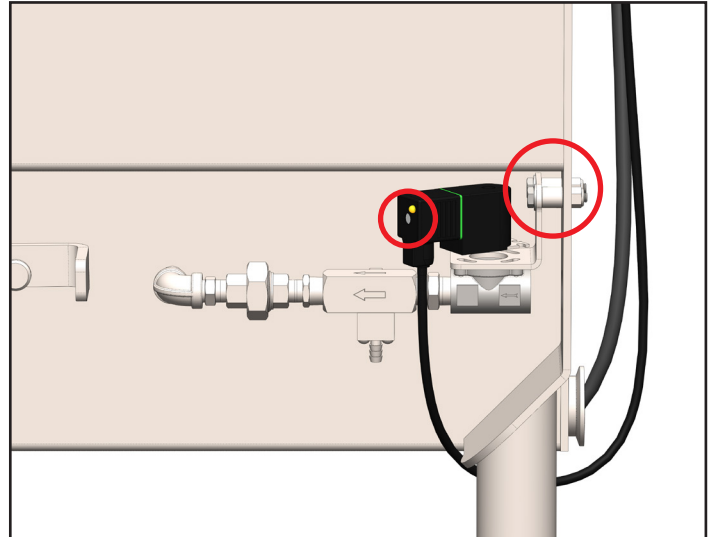


Fig. 10.1: Solenoid set screw and mounting bolts

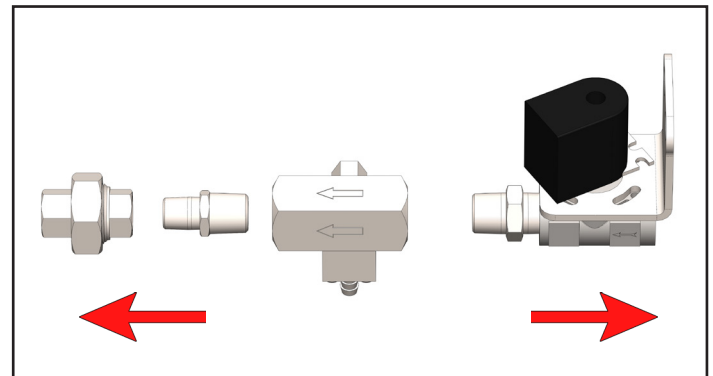
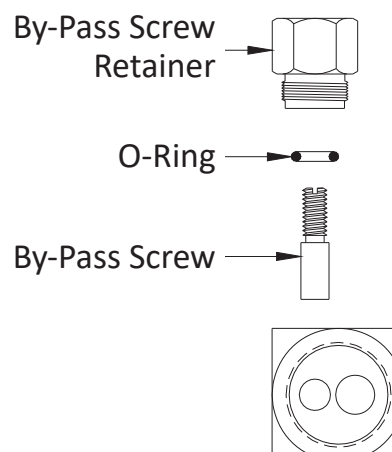
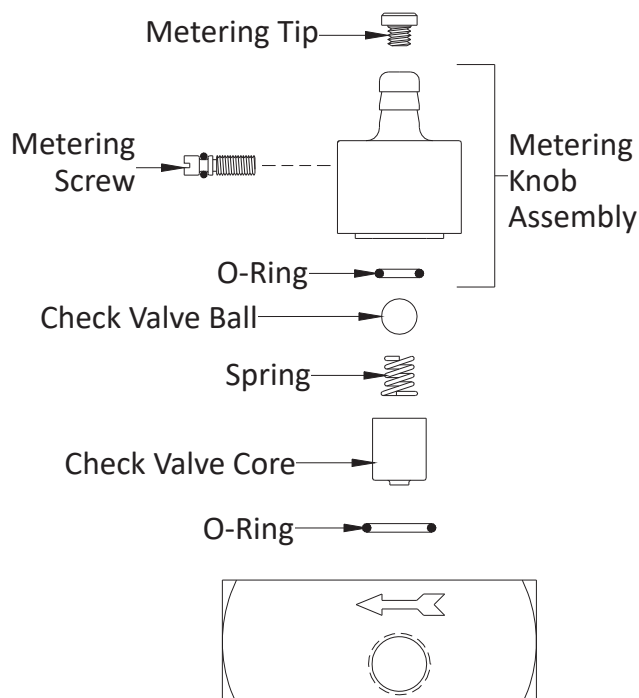


Fig. 10.2: Removing Venturi and Solenoid from pipe fittings



## Appendix E - Venturi System Metering Tips

### Solenoid & Venturi Injector Maintenance:

1. See [Figure 19.1] for location of water bypass screw and fine metering adjustment screw.
2. Turn on water supply valve.
  - The injector may draw momentarily as the system is filling but will stop as it builds up to full pressure.
3. To actuate injector, turn the bypass screw clockwise until product begins to be drawn from the container.
4. After the fluid reaches the injector, the feed rate may be adjusted to the desired rate by turning the bypass screw:
  - For low injection rates, it is advisable to set the bypass screw for more injection than required; then turn the metering screw clockwise to reduce to the desired rate.
  - **Common Issues:**
    - **Injector will not draw with bypass screw full-in** = water flow is *below* range of the injector.
    - **Injector draws with screw full-out, but pressure loss is excessive** = flow is *above* the range.

Water Pressure psi	Operating Range Gal/Min
10	0.50- 3.50
20	0.55- 4.40
40	0.70- 5.40
60	0.80 - 6.40
100	1.00- 8.00
200	1.40 - 11.00
400	1.90 - 15.00
500	2.10 - 17.00
*700	2.50 - 20.00
*1000	3.00 - 23.00
*1500	3.50 - 28.00
*2000	4.70 - 37.00
*3000	5.00 - 45.00

Table 19.3: Operation Range of injector

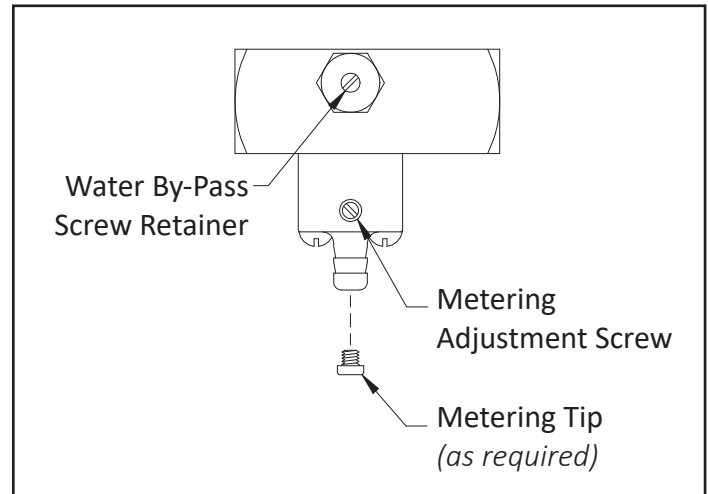


Fig. 19.1: Venturi Metering tip and adjustment screw locations

Fluid Viscosity cps	Maximum Injection Oz/Min
1	16
75	8
200	4

Table 19.1: Maximum Injection Rates

Metering Tip Color	Viscosity cps		
	1	75	200
Tan	1.1	0.8	0.5
Orange	1.4	1.0	0.7
Turquoise	2.0	1.4	1.0
Pink	2.7	1.8	1.3
Clear	3.5	2.4	1.6
Brown	4.0	2.7	1.7
Red	4.9	3.3	2.0
White	5.9	3.9	2.3
Green	6.5	4.4	2.5
Blue	7.2	4.9	2.7
Yellow	9	5.9	2.9
Black	12	6.7	3.0
Purple	14	6.7	3.1
Gray	15	7.1	3.3
NONE	16	8.0	3.7

Table 19.2: Injection rates using metering tips