

# USER MANUAL

BSX900-DAF

Compact Walk Through Boot Scrubber



# USER MANUAL: BSX900-DAF

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

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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 SDS sheet for further first aid measures.
5. Follow safety instructions of chemical manufacturer (SDS).
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.



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## Overview

The BSX900-DAF is a compact walkthrough, sole-only, footwear scrubbing unit built to accommodate 1 user at a time with the ability to put through 15-25 users per minute.

The included user manual contain installation, operation, and maintenance instructions for all **BSX900-DAF** (115V, 230V, or 480V) Boot Scrubbers. The reference images and diagrams contained within will vary by model, but are subject to the same procedures as outlined.

For further support or information please contact your sanitation representative or Best Sanitizers, Inc. technical support.

## Specifications

- Construction: 304L stainless steel, UHMW, Polypropylene
- Weight: 425 lb (192.78 kg)
- Dimensions: 62 7/8" x 45 3/8" x 54 3/4"  
(1,597 x 1,152.5 x 1,390.65 mm)
- Water Consumption: 0.75-1.5 GPM  
(2.8 - 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 and capillary-tube style injector metering tip.

### WARRANTY

One year warranty on all parts and components. Warranty void if unit is misused, modified, serviced by anyone other than an authorized technician, or used with an incompatible chemical. We recommend using Alpet® No-Rinse Quat Sanitizer.

## System Requirements

### Water Supply

- Flow: 1.5 GPM (3.8 L/m) minimum\*
- Pressure: 30-60 psi (207-414 kPa)\*\*
- Temperature: 40-100°F (4-38°C)

*Minimum 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:** A back flow preventer must be installed in the water line to this unit. Check local codes to ensure proper installation.

### Electrical

- 115VAC, single phase, 60Hz, 19.1A  
(BSX900-DAF-115V)
- 230VAC, single phase, 60Hz, 13.7A  
(BSX900-DAF-230V)
- 480VAC, triple phase, 60Hz, 3.9A  
(BSX900-DAF-480V)

**Questions? Call us at 888.225.3267**

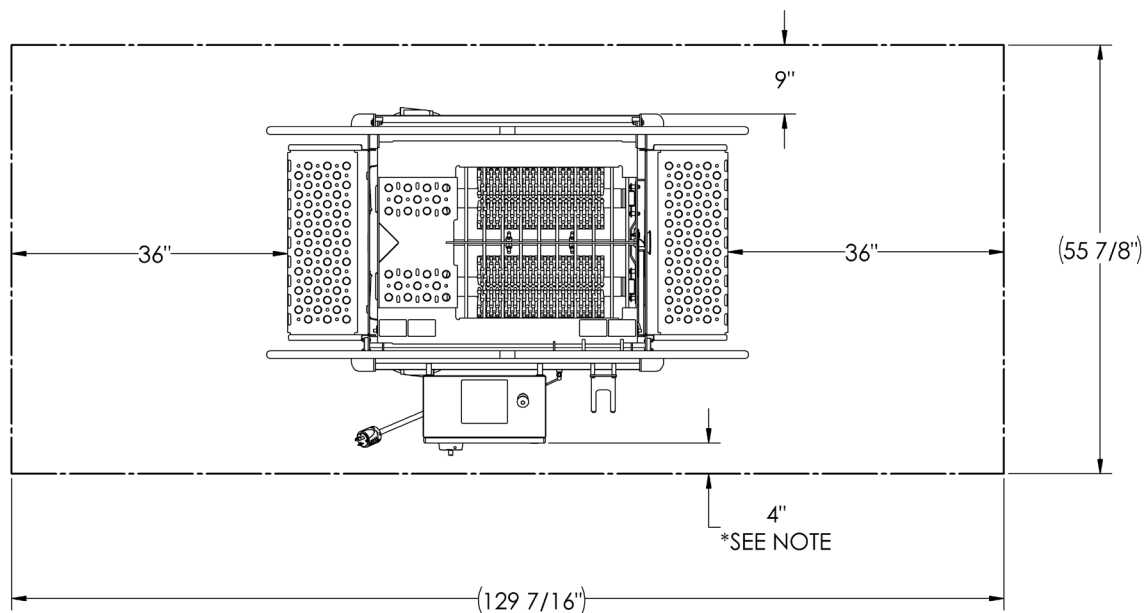


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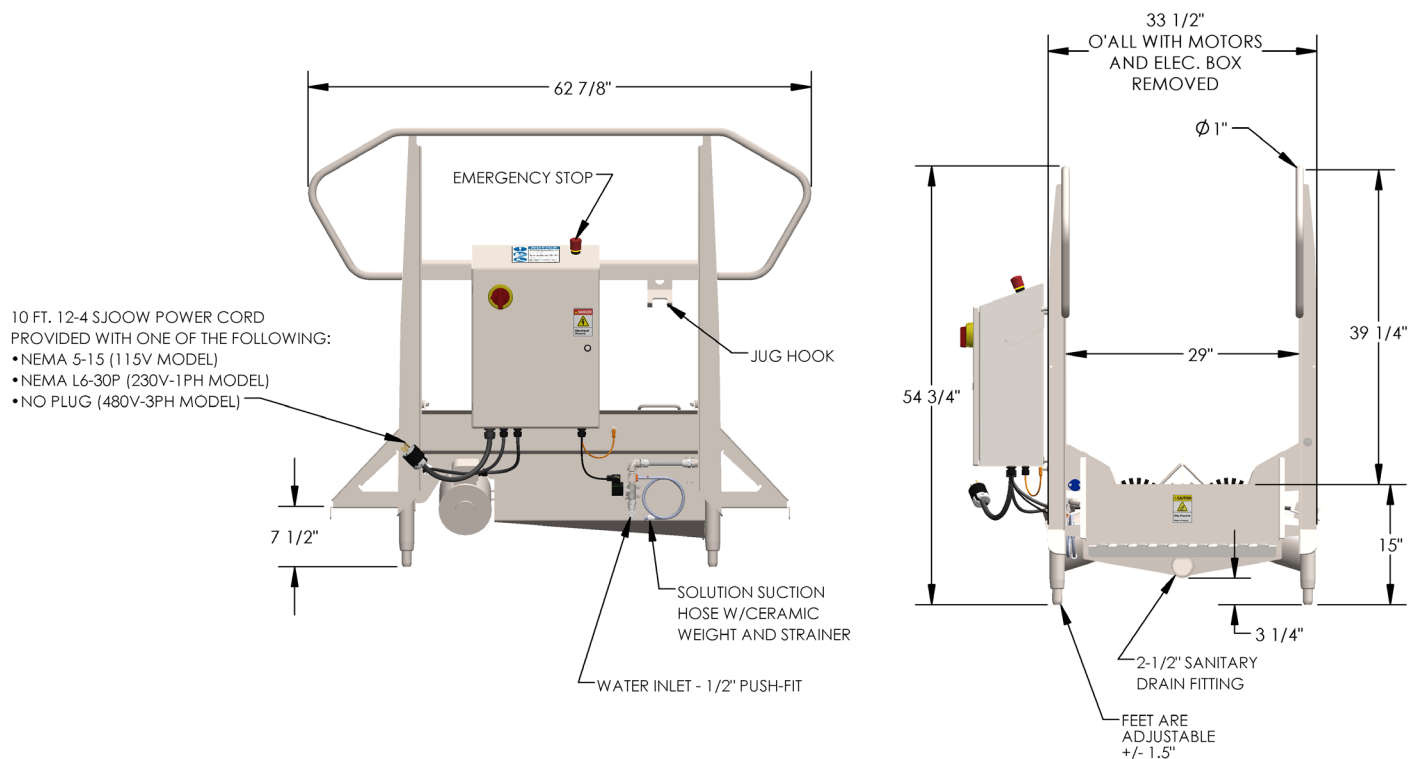
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## Installation



**NOTE:** For fixed installations, area in front of electrical panel must have at least 36" of clearance.



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## Installation

### Physical Set Up:

1. Set unit in desired location.
2. Aspects to consider when deciding on placement:
  - Clearance for entering and exiting
  - Location of drain
  - Emergency exit paths or egress in case of emergency
  - Head room for personnel while using the unit
  - 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 or using the handrails. Pad the forks to protect the finish.

3. Use a level to make sure the unit is stable and leveled at each end of the tub [Figure 5.1].
4. Connect unit to electrical supply.

### Plumbing Connections:

1. Connect water source to solenoid valve quick fitting inlet using 1/2" Polyethylene tubing or similar [Figure 5.2].
2. If necessary, adjust the dilution ratio by selecting an appropriate metering tip (included) and test.
  - 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.
3. With the metering tip installed, connect solution source to orange hose barb of the Venturi Injector (located above water inlet) using 1/4" clear PVC tubing (included) [Figure 5.2].

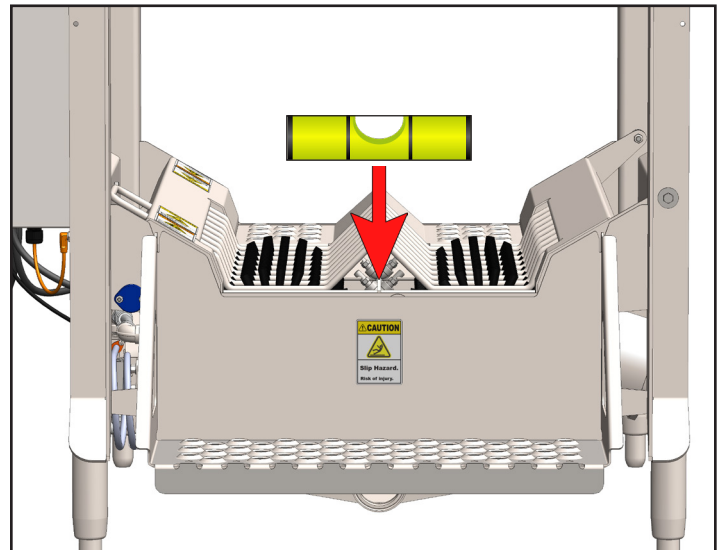


Fig. 5.1: Level and stabilize unit using level against end cap of tub

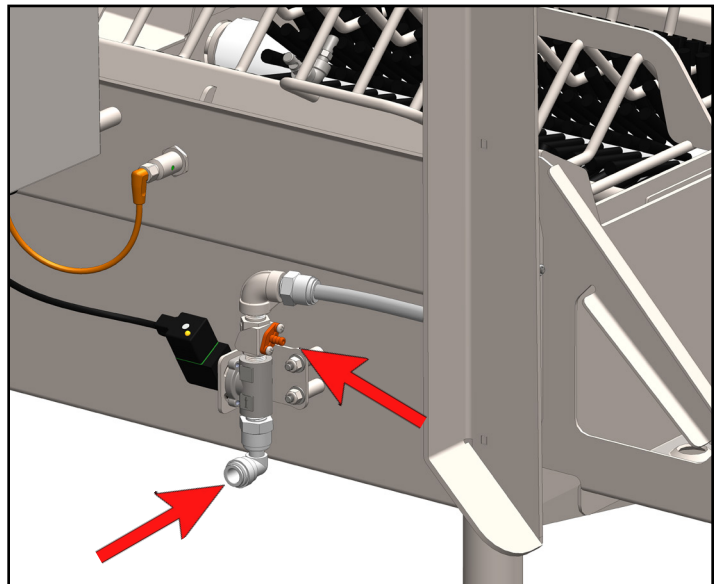


Fig. 5.2: Water and Venturi Injector (solution) inlets

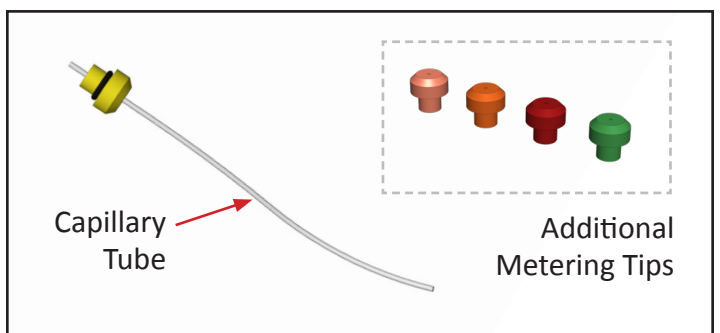


Fig. 5.3: Metering Tips and Capillary Tube

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## 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. Best Sanitizers, Inc. recommends 70 RPM/48 Hz.



Fig. 6.1: PowerFlex 4M Variable Frequency Drive

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## Operation

### Start Up

1. Verify installation has been completed:
  - Brushes are secure
  - Walkway grate is lowered
  - Unit is plugged in and receiving power
  - Water and solution have been plumbed and lines are open
2. Pull the E-STOP switches up and engage power, the E-STOP will illuminate red when the unit is receiving power [Figure 7.1].

**NOTE:** Prior to placing footwear into the unit, test that it is working properly by activating the sensor (put weight on the grate).

### Use

1. Step onto the walkway grate.

#### CAUTION:

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

2. The walkway grate will depress, activating a proximity sensor which starts the brush rotation and solution spray [Figure 7.2].
3. Walk through the unit, allowing the rotating brushes to clean by moving the boot to make contact with hard to reach areas.
4. One second after the user steps off of the walkway grate 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.

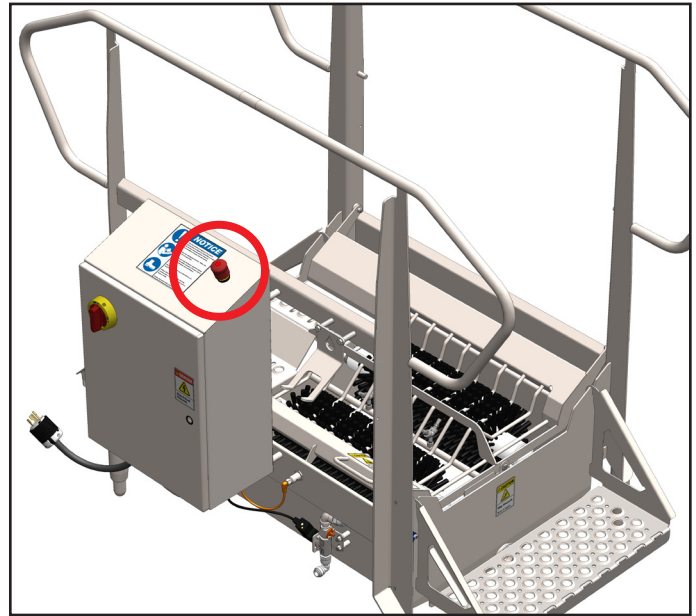


Fig. 7.1: E-STOP indicator light on control box

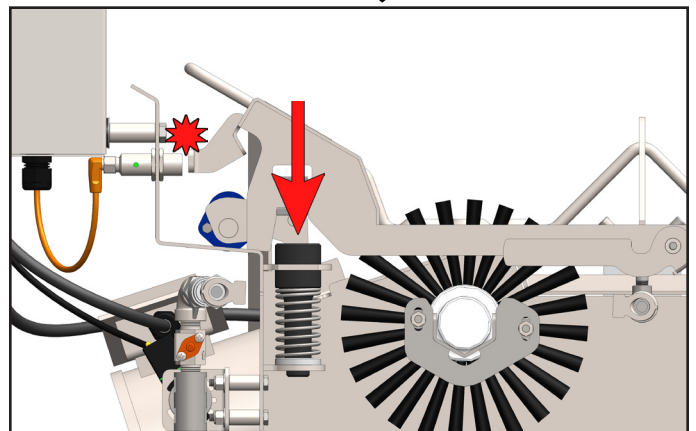
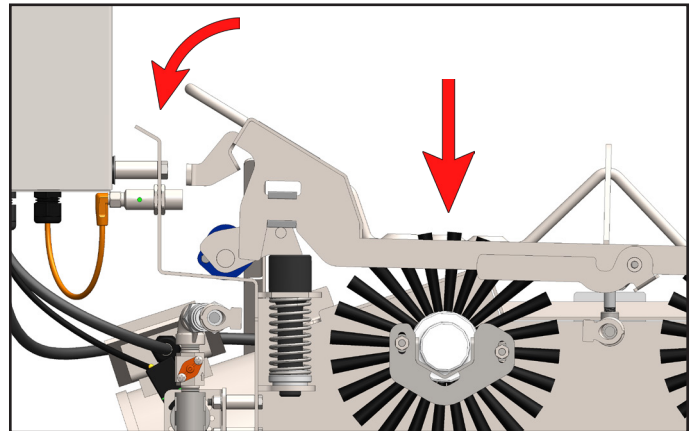


Fig. 7.2: Grate triggering Prox Switch (some components hidden for clarity)

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## Cleaning Procedures



### CAUTION:

Failure to latch the grate properly could result in grate falling closed unexpectedly.

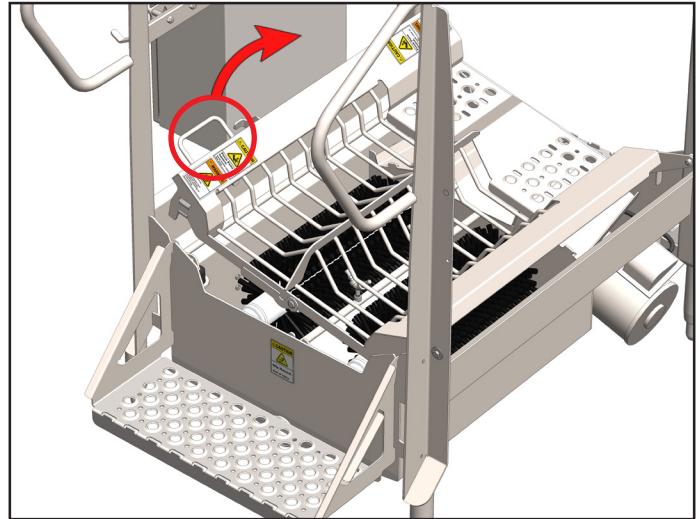


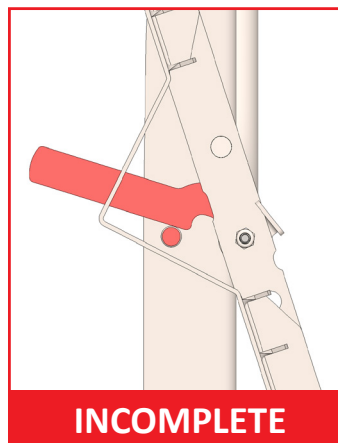
Fig. 8.1: Grate Lifting, shown on BSX1000S-DAF

## Removing & Replacing Brushes

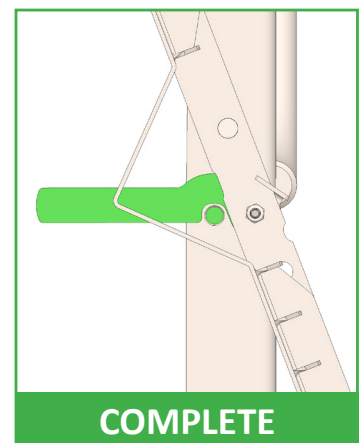
1. Shut down the unit and open the grate.
2. Lift each brush out of the tub by grabbing the open end and lifting up [Figure 8.3 - Arrow 1].
3. With the open end lifted, the brush can be detached from its anchor [Figure 8.3 - Arrow 2].
4. Repeat this process to remove the other brush.
5. Brushes can be washed individually in a COP tank or wash machine.

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

6. The tub can be washed by conventional means.



INCOMPLETE



COMPLETE

Fig. 8.2: Grate Latch Orientation

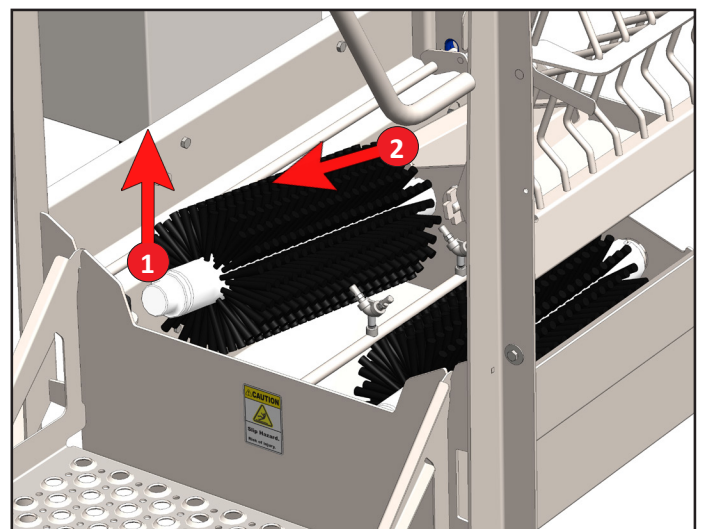


Fig. 8.3: Brush removal process



### CAUTION:

Use of high pressure (above 400 PSI) is not recommended on sensitive areas such as electrical components, motors, or gearboxes.



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## Cleaning Procedures (continued)

### Removing Steps

1. Shut down the unit.
2. Grab either side of the step by the handles.
3. Lift up to remove from tub [Figure 10.1].
4. Steps can be washed individually in a COP tank or wash machine.
5. Replace steps before enabling power and/or use.

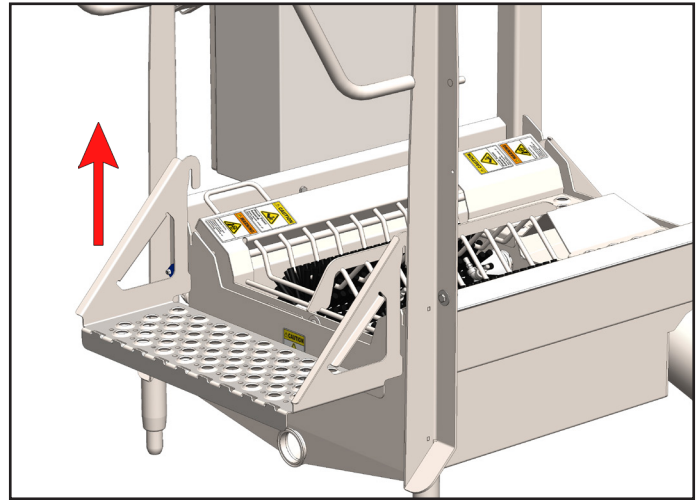


Fig. 10.1: Step removal

### Removing Grate Springs & Balancer

1. Open the Grate.
2. Rotate the Spring Balancer Weldment backward to provide enough clearance to remove the Spring assembly [Figure 10.2].
3. Lift the opposing end of the Balancer Weldment into the upper section of its keyhole. [Figure 10.3 - Arrow 1]
4. Slide the Balancer through the upper section of the keyhole to release the other end. [Figure 10.3 - Arrow 2]
5. Lift the free end up while sliding the Balancer out the keyhole to completely remove from the tub. [Figure 10.3 - Arrow 3]
6. Springs and Balancer Weldment can be washed individually in a COP tank or wash machine.

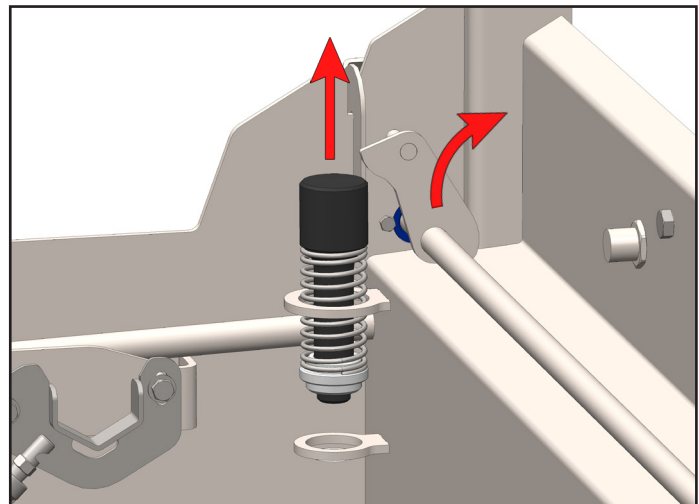


Fig. 10.2: Balancer Weldment rotation to remove Spring

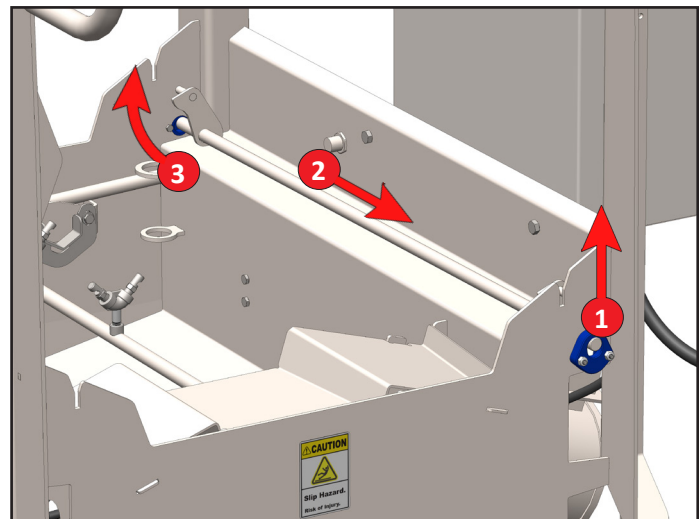
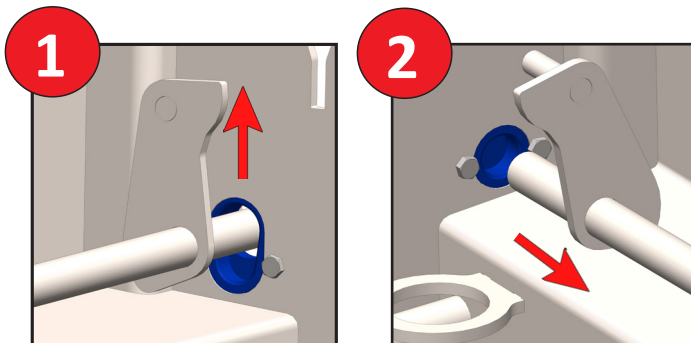


Fig. 10.3: Balancer Weldment removal procedure



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## Advanced Configuration Options

### Motor Current Sensor

The motor current sensor monitors the current draw of the motor and will stop the motor if an over-torque condition occurs, resulting in an F002 fault code on the VFD.

Default Set Point = 10 turns clockwise

#### ***Raise the Set-Point:***

1. Turn screw clockwise ½ turn and test

#### ***To Start Over:***

1. Turn screw counter-clockwise until it clicks.
2. Turn the screw clockwise 10 turns and test.

The sensor also features a time delay that is adjustable from 0.12 to 15 seconds. The current draw of the motor **MUST** exceed the time delay set point continuously for this duration in order for a fault to occur.

Default Time Delay = 1/8 turn (about 0.3sec / 300ms)

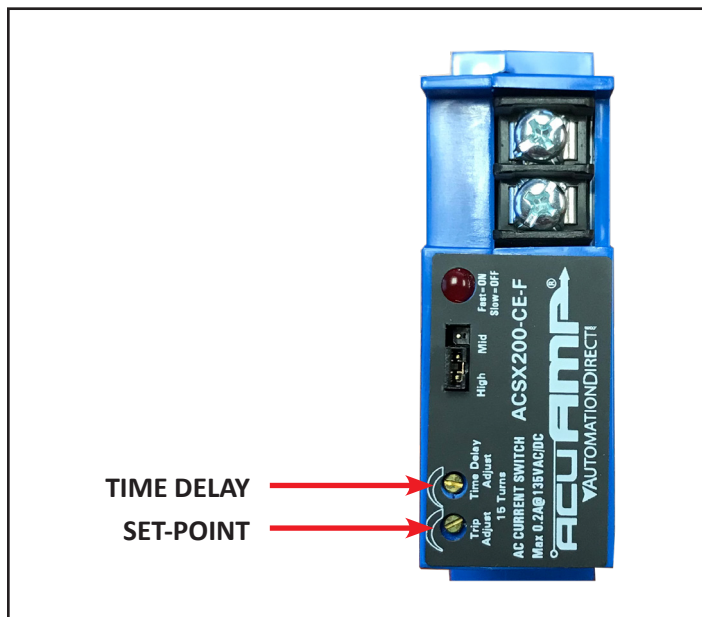


Fig. 11.1: Current Sensor Settings Identification

### Brush RPM Formula:

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

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

#### ***Example:***

- Motor Nameplate RPM = **1750**
- Motor Nameplate Frequency (Hz) = **60**
- Gear Reduction = **20**
- Drive Frequency (Hz) = **48**

$$= 1750 \times 48 \div 60 \div 20 = \underline{\underline{70 \text{ RPM}}}$$

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

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

#### ***Example:***

- Desired Speed in RPM = **70**
- Gear Reduction = **20**
- Motor Nameplate Frequency (Hz) = **60**
- Motor Nameplate RPM = **1750**

$$70 \times 20 \times 60 \div 1750 = \underline{\underline{48 \text{ Hz}}}$$



### **DANGER:**

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

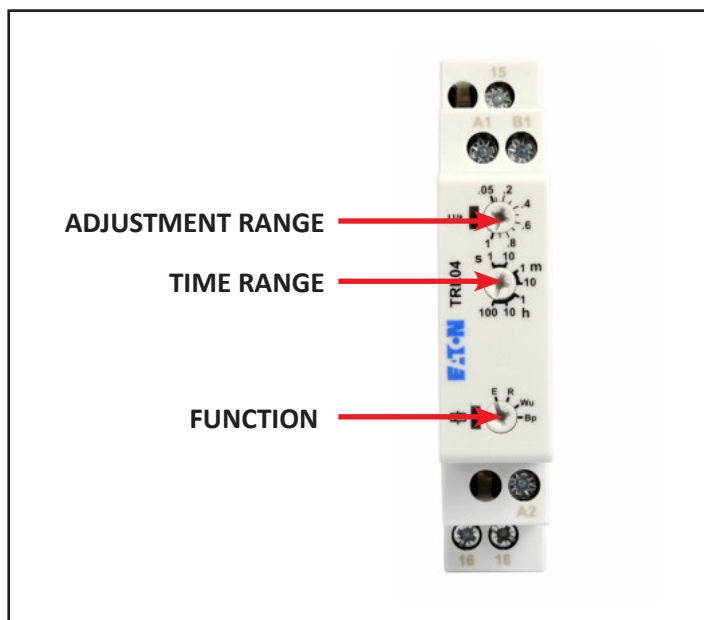
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## Drive Parameter Settings

Parameter Number	Description	Setting	Units
P102	Motor NP Hertz	60	Hz
P103	Motor OL Current	1.7	A
P104	Minimum Freq	15	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



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

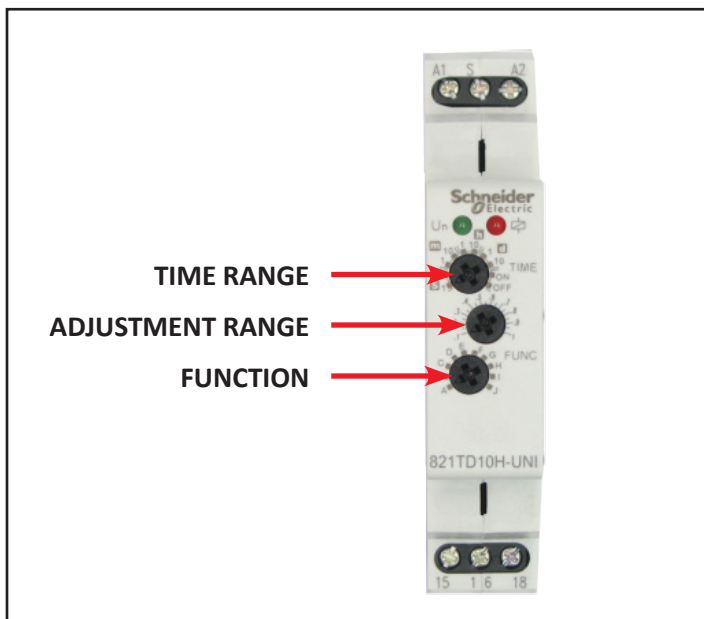


**Fig. 12.1: Eaton TRL04 Setting Identification**

**Eaton TRL04**

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

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



**Fig. 12.2: Schneider Magnecraft Setting Identification**

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## Preventative Maintenance

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

**NOTE:** Control box is equipped with a Lock-Out/Tag-Out switch for restricted power access when performing maintenance procedures.

### General Maintenance Instructions

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

#### Daily:

- Thoroughly clean and sanitize unit, brushes and components.
- If running multiple shifts, clean after every shift if possible.
- Test chemistry for proper dilution.

#### Weekly:

- Check unit for proper sensor function and brush rotation.
- Ensure spring loaded grate (if applicable) is 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 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.

#### Opening Grate

1. Shut down the unit (see pg. 5) and lift the grate up by its handle [Figure 8.1].

2. Swing the grate open completely

Latch into place against the pin attached to the corner rail [Figure 8.2].

#### 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.
- Keep clean and ventilating openings (on TEFC motors) clear of any obstructions.
- 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.

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## Troubleshooting

### Unit will not operate:

- Follow the startup procedure (pg. 7)
- Verify the control box is closed and the power-disconnect switch is in the ON position.
- Verify that there is power going to the unit.
  - Verify the circuit breakers in the building have not been tripped.

### Unit will not spray:

- Verify water pressure at the inlet to the water/solution solenoid (35 psi min.)
- Inspect spray nozzles for clogging.
- Verify that the orange LED light on the solenoid valve connector illuminates when the brushes are rotating.

### Green START button is illuminated, but one or more brushes will not rotate when unit is activated:

- Power cycle the unit by turning the disconnect switch to OFF and then back to ON. Follow the start up procedure on Page 7.

### 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
- Use the yellow “Capillary Tube” style metering tip (see pg. 5 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.

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## Troubleshooting (continued)

### 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:** Best Sanitizers, Inc. recommends Leviton's GFI protection device [# **GFRBF-W**] for circumstances where the facility's original GFCI plug is not applicable.

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## Appendix A - Parts Callout (BSX900-DAF)

Part No.	Description
F1000	STANDOFF 1/4-20 x 1/2 x 1/2 SS
F1040	BOLT HHC 5/16-18 x 1-1/4 SS
F1047	NUT NYLOCK 1/4-20 SS
F1052	NUT NYLOCK 5/16-18 SS
F1056	WASHER 1/4 SS TYPE A
F1066	NUT NYLOCK 10-32 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
F1088	BOLT HHC 1/4-20 X 1-3/4 SS
F1126	BOLT HHC 10-32 X 1 SS
F1130	BOLT HHC 5/16-18 X 5/8' SS
F1135	STANDOFF 1/4 X 1/2 X 3/16 SS
F1136	STANDOFF 1/4 X 1/2 X 1 SS
F1139	BOLT SHUTTER 1/4-20 X 1 SS
F1166	BOLT HHC 5/16-18 X 2-1/4' SS
M1134	SOLENOID BRACKET
M1183	DRIVE SHAFT MOTOR-BRUSH WELDMENT
M1237	GRATE LATCH
M1420	BRUSH SUPPORT WELDMENT
M1534	SPACER .313 X .5 X 1.5
M1720	BRUSH BSX HORIZONTAL SOLE
M1746	BSX JUG HOOK
M1758	BSX GRATE STEPPED HINGE PIN
M1795	BSX FORMED STEP 24 INCH
M1850	BSX1000 GEN2 SPRAY NOZZLE RISER WELDMENT
M1851	BSX1000 GEN2 PIPE NIPPLE
M1852	BSX1000 GEN2 MOTOR COVER
M1892	BSX SPRING BALANCER WELDMENT V3
M1894	BSX C-CHANNEL GRATE LIFT PIN GLIDE
M1896	BSX GRATE SPRING ASSEMBLY
M1904	BSX SPRING BALANCER BEARING ROUND
M1905	BSX SPRING BALANCER BEARING SLOTTED
M1981	BSX900 TUB WELDMENT
M1982	BSX900 SPRAY MANIFOLD WELDMENT

Part No.	Description
M1986	BSX900 GRATE V3 WLDMNT
P1005	STERLING SS MOTOR 1/2HP, 1800 RPM, 230/460/3/60, TENV, 56C FOOTLESS
P1006	STERLING GEAR REDUCER 20:1, 56C, HOLLOW QUILL, .625 HOLLOW OUTPUT, 1.33" CENTER DISTANCE,
P1046	VALVE, SOLENOID, 3/8" SS 24VDC DIN COIL, DEMA 463PS.4D
P1121	Induce Proxy 18mm PP 8mm RN 4-Wire DC N.E./M.C. M12 IQ/D Shielded
P1147	CORD GRIP 1/2 NPT X .170-.450 BLK HEYCO M3231
P1148	CORD GRIP NUT 1/2' NPT BLACK - HEYCO 8463
P1187	SOLENOID CABLE 18MM DIN 24V LED 3M SC18-LS24-3
P1242	TERMINAL, 1/4" RING, 14-16 AWG INS
P1252	PIPE PLUG 1/4" NPT SOCKET HD SS
P1331	1/2" OD POLYETHYLENE TUBING - NATURAL
P1400	CABLE, M12, 4 POLE, 5m (16.48 ft), RT-ANG FEMALE/AXIAL MALE
P1418	QUICK FIT ADAPTER 3/8 NPT X 1/2 TUBE PP
P1511	QUICK FIT STEM ELBOW 1/2' X 1/2'
P1599	METERING TIP, CAPILLARY TUBE
P1769	METERING TIPS, ULTRA LEAN 100-15KU
P1828	WIRE, VFD-MOTOR, 14 AWG, 4-CONDUCTOR, SHIELDED, XLPE/PVC
P1830	PIPE ELBOW 3/8" x 90 304SS
P1903	VENTURI INJECTOR DEMA ROCKET, ORANGE, .070", 1.3GPM@100PSI, SINGLE BARB
P1934	GREASE, ELECTRIC INSULATING .17OZ ONE TIME USE PACK
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

Distributed by:



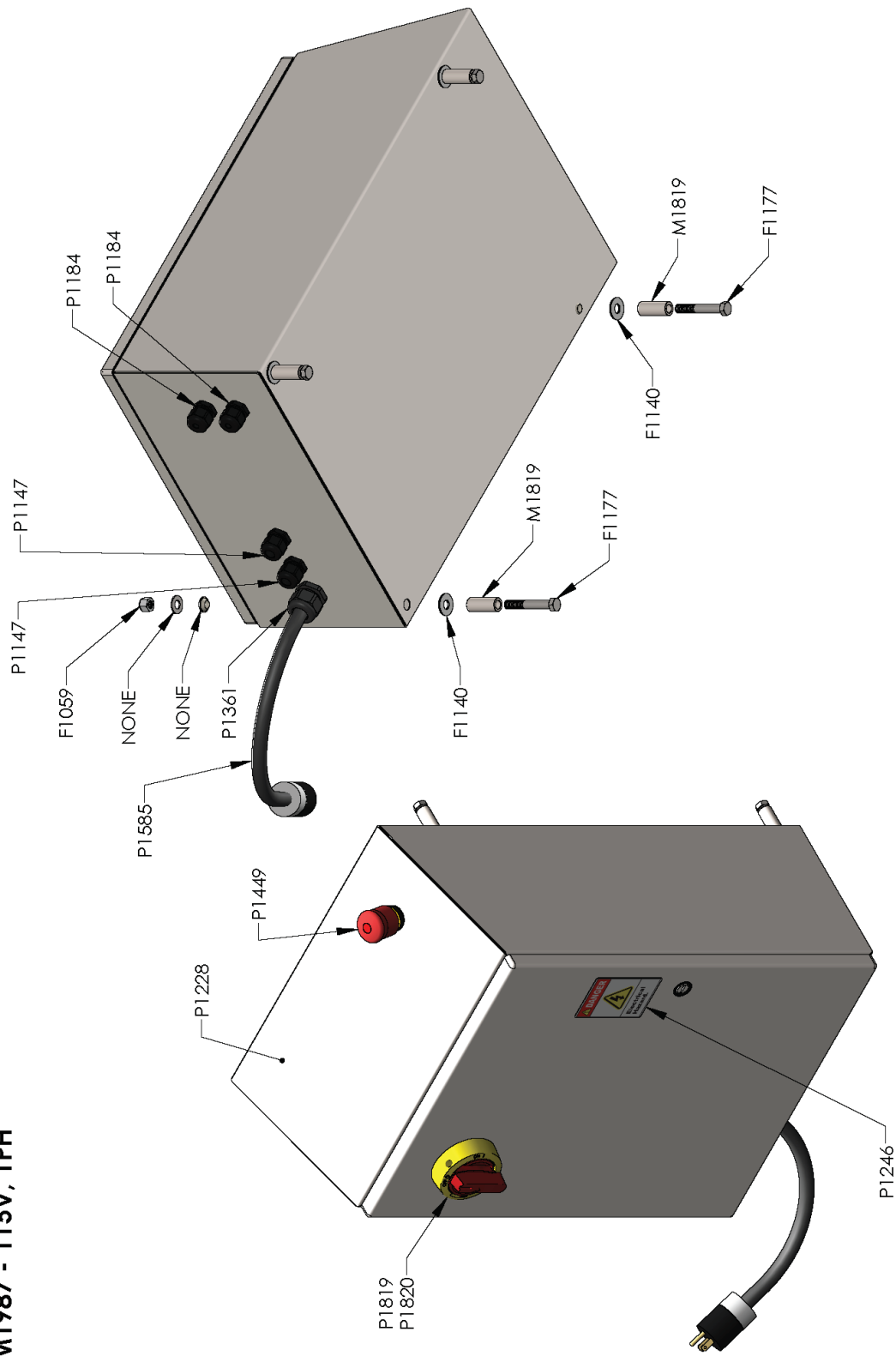
800-826-8302 nelsonjameson.com

USER MANUAL: BSX900-DAF

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

Appendix A - Parts Callout (M1987 : 115V, 1PH)

M1987 - 115V, 1PH

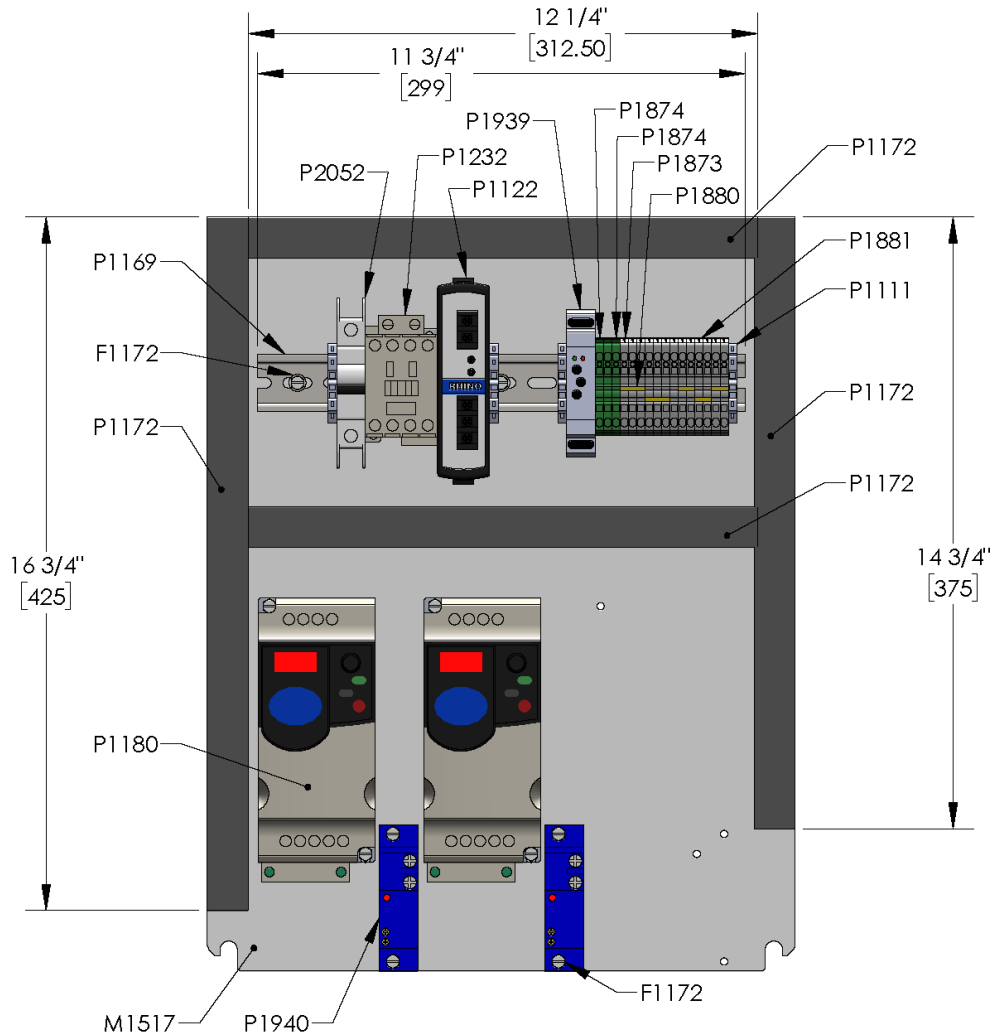


FOR ELECTRICAL SCHEMATIC, REFER TO  
DRAWING NUMBER **ES1022**

# USER MANUAL: BSX900-DAF

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

## Appendix A - Parts Callout (M1987 : 115V, 1PH)



Part No.	Description
F1059	NUT NYLOCK 3/8-16 SS
F1140	WASHER SEALING 3/8" ID 1" OD SS
F1172	SCREW THREAD FORMING 10-32 X 1/2 HEX WASHER HEAD ZINC
F1177	BOLT HHC 3/8-16 X 2-1/2 SS
M1517	BACK PANEL CP2016
M1819	SPACER 3/8" X 1-1/2" SS
P1111	ENDSTOP PHOENIX CONTACT 3022276 CLIPFIX 35-5
P1122	POWER SUPPLY RHINO 24VDC 60W PLASTIC CASE
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
P1228	ENCLOSURE SS 20x16x8 SLOPED TOP HOFFMAN
P1232	IEC CONTACTOR 3P 12A 24VDC COIL 1 N/O AUX CONTACT

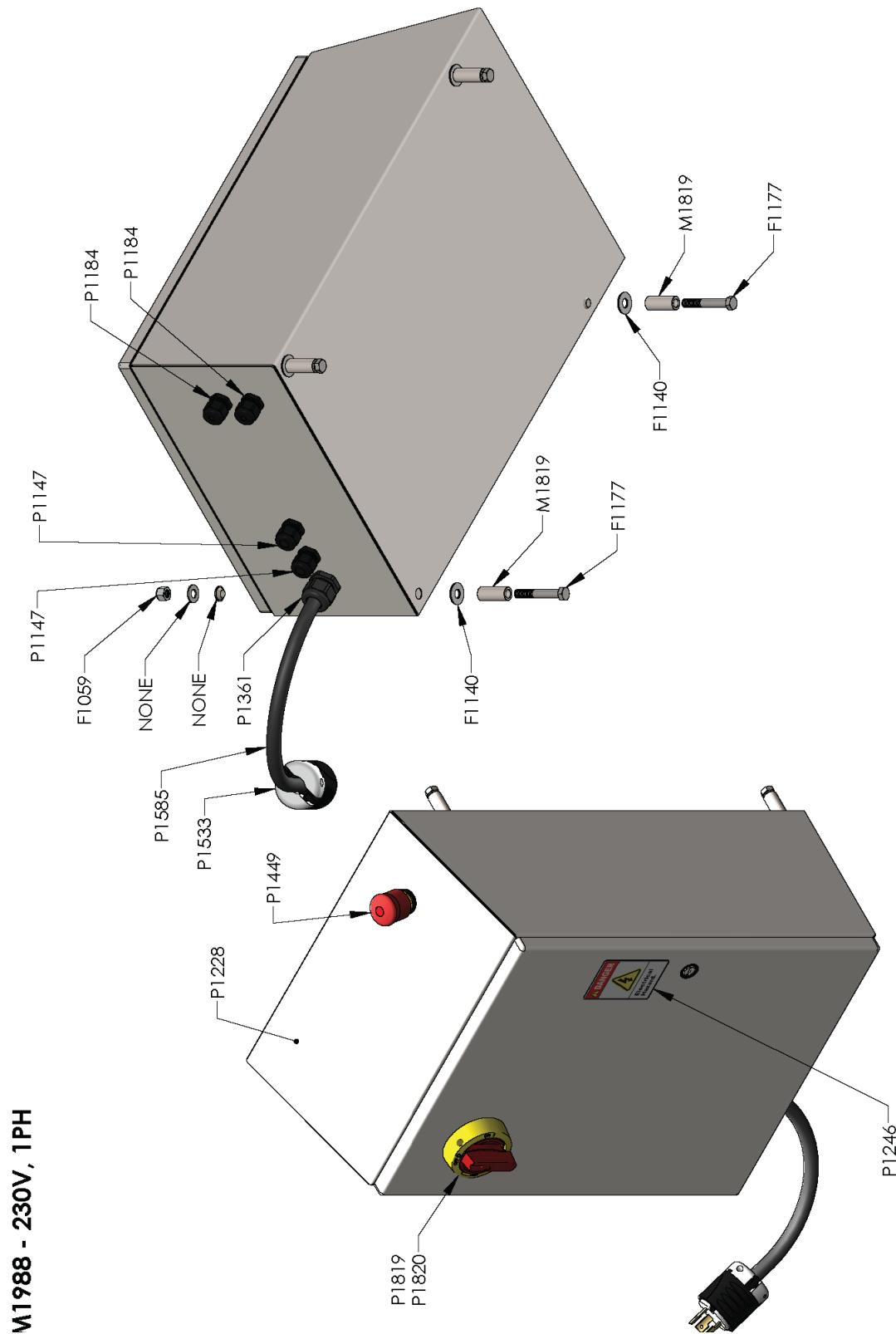
Part No.	Description
P1325	CIRCUIT BREAKER EATON WMZT2D13
P1347	VARIABLE FREQUENCY DRIVE POWERFLEX 4M 1/2HP 240V 1PH
P1361	CORD GRIP 3/4 NPT X .435-.705 BLK HEYCO M3234
P1585	WIRE SJOWW 12AWG 4 CONDUCTOR BLACK (0.650 OD) 600V 02726.41T.01
P1711	INDICATOR LIGHT 24V MODULAR LED GREEN
P1819	DISCONNECT SWITCH 25A 3-POLE
P1820	DISCONNECT HANDLE KIT RED/YELLOW FOR P1819
P1873	TERMINAL BLOCK SPRING CLAMP 5.1mm GRAY
P1874	TERMINAL BLOCK SPRING CLAMP 5.1mm GROUND
P1880	TERMINAL JUMPER 5.1mm
P1939	RELAY, TIMER, MULTIFUNCTION 24VDC
P1940	SWITCH, CURRENT SENSING WITH TIME DELAY, 1-175A ADJUSTABLE, FIXED CORE, NC



USER MANUAL: BSX900-DAF

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

Appendix A - Parts Callout (M1888 : 230V, 1PH)

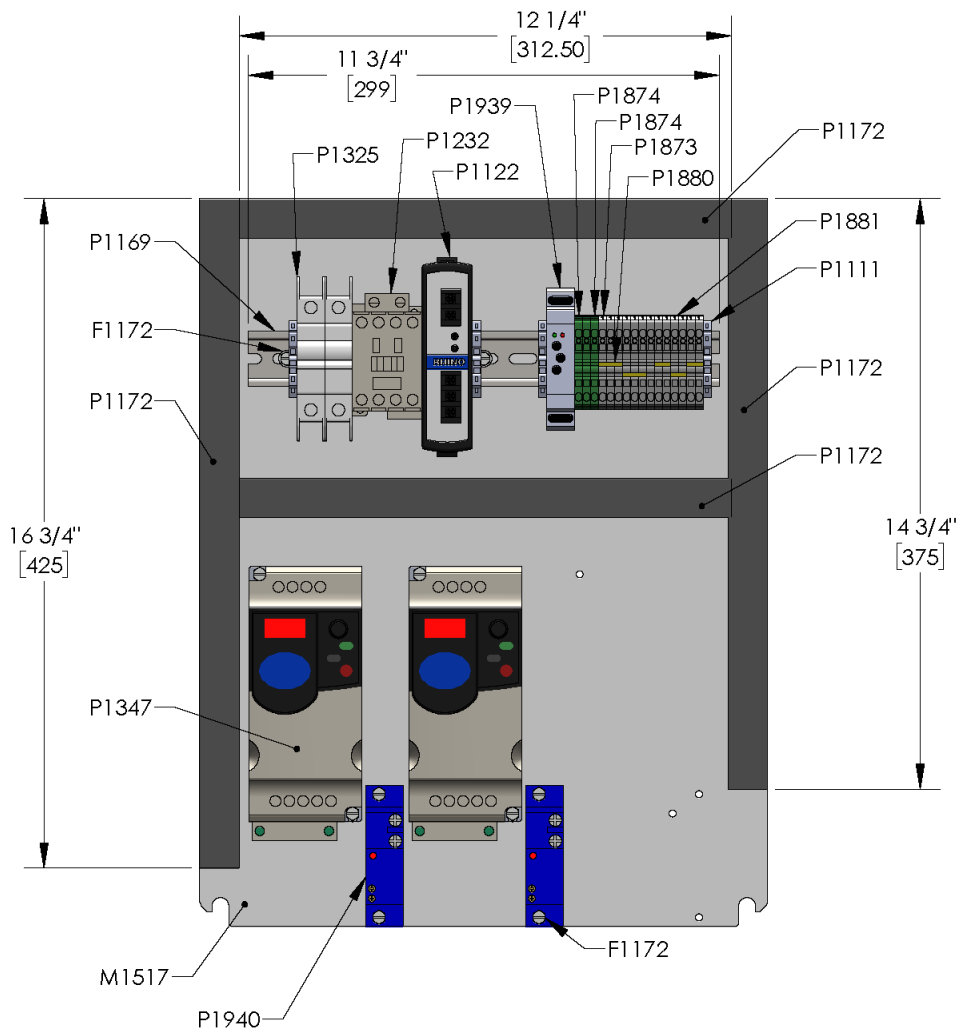


M1888 - 230V, 1PH

FOR ELECTRICAL SCHEMATIC, REFER TO  
DRAWING NUMBER **ES1023**

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

## Appendix A - Parts Callout (M1888 : 230V, 1PH)



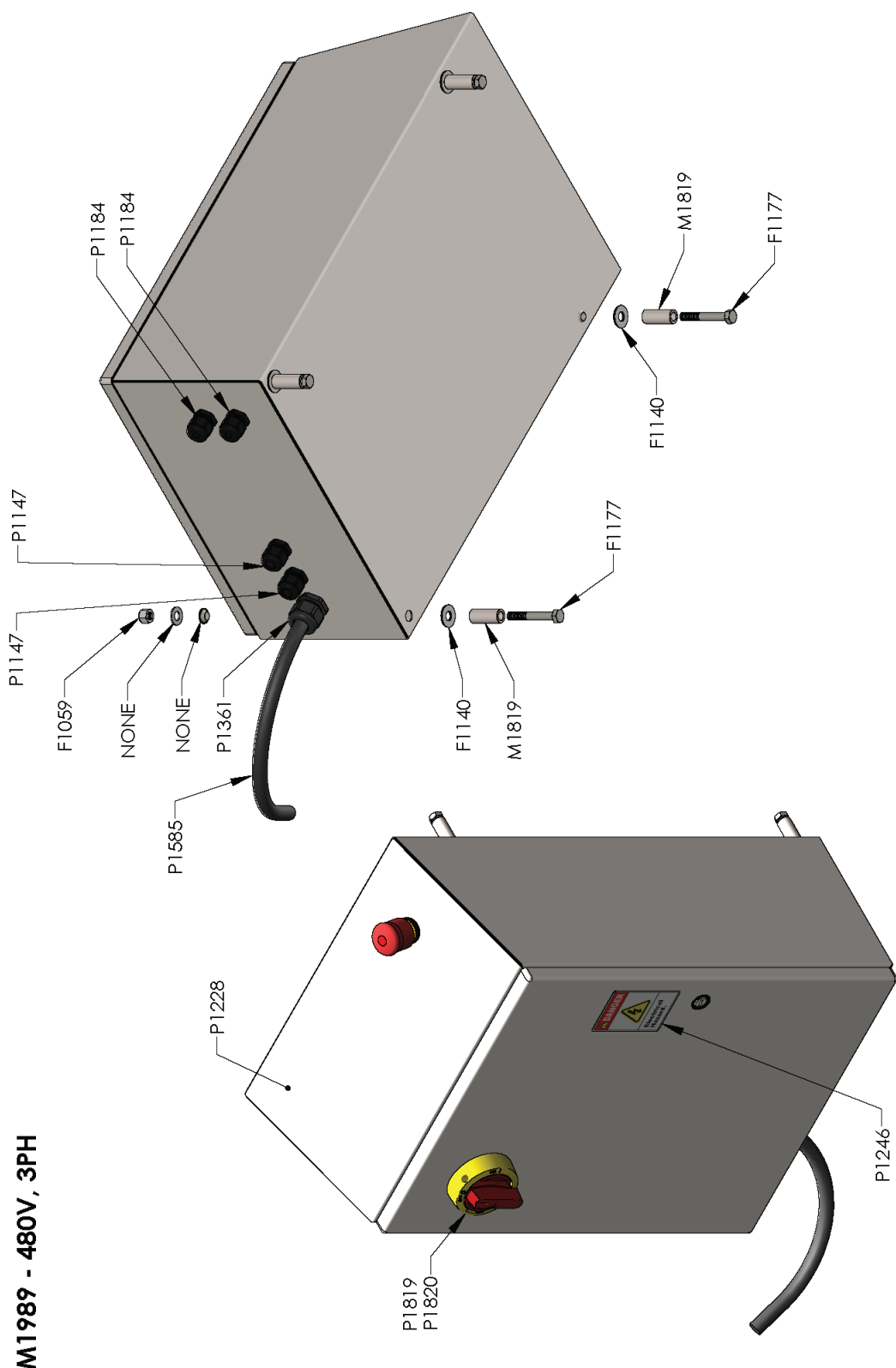
Part No.	Description
F1059	NUT NYLOCK 3/8-16 SS
F1140	WASHER SEALING 3/8" ID 1" OD SS
F1172	SCREW THREAD FORMING 10-32 X 1/2 HEX WASHER HEAD ZINC
F1177	BOLT HHC 3/8-16 X 2-1/2 SS
M1517	BACK PANEL CP2016
M1819	SPACER 3/8" X 1-1/2" SS
P1111	ENDSTOP PHOENIX CONTACT 3022276 CLIPFIX 35-5
P1122	POWER SUPPLY RHINO 24VDC 60W PLASTIC CASE
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
P1228	ENCLOSURE SS 20x16x8 SLOPED TOP HOFFMAN
P1232	IEC CONTACTOR 3P 12A 24VDC COIL 1 N/O AUX CONTACT

Part No.	Description
P1325	CIRCUIT BREAKER EATON WMZT2D13
P1347	VARIABLE FREQUENCY DRIVE POWERFLEX 4M 1/2HP 240V 1PH
P1361	CORD GRIP 3/4 NPT X .435-.705 BLK HEYCO M3234
P1363	CORD GRIP NUT 3/4' NPT NYLON HEYCO 8465
P1449	Push-Pull Pushbutton, Red, 24V
P1533	250V 30A L6-30 MALE PLUG
P1585	WIRE SJOWW 12AWG 4 CONDUCTOR BLACK
P1819	DISCONNECT SWITCH 25A 3-POLE ALTECH KU325N
P1820	DISCONNECT HANDLE KIT ALTECH OKA/KU LK10 Y/R
P1873	TERMINAL BLOCK SPRING CLAMP 5.1mm GRAY
P1874	TERMINAL BLOCK SPRING CLAMP 5.1mm GROUND
P1939	RELAY, TIMER, MULTIFUNCTION 24VDC EATON TRLO4
P1940	SWITCH, CURRENT SENSING WITH TIME DELAY

USER MANUAL: BSX900-DAF

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

Appendix A - Parts Callout (M1889 : 480V, 3PH)



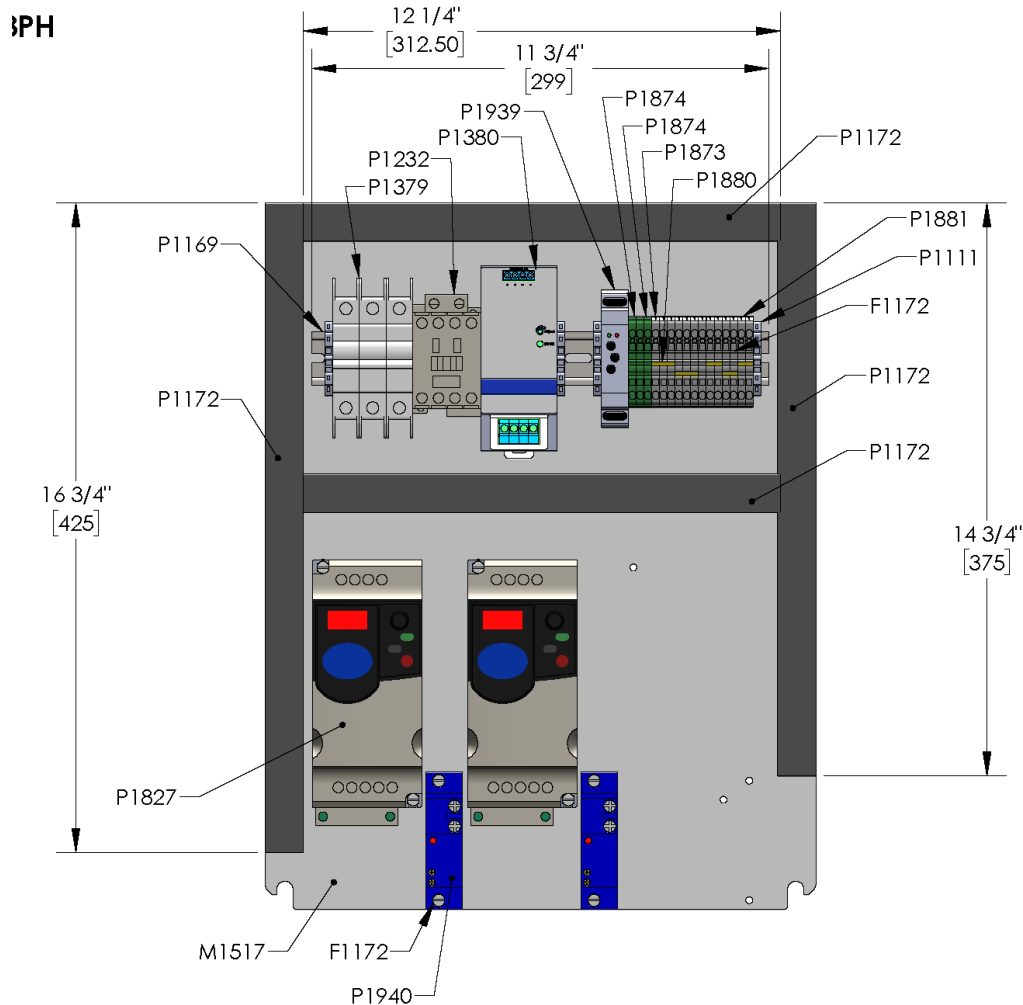
M1989 - 480V, 3PH

FOR ELECTRICAL SCHEMATIC, REFER TO  
DRAWING NUMBER ES1024

# USER MANUAL: BSX900-DAF

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

## Appendix A - Parts Callout (M1889 : 480V, 3PH)



Part No.	Description
F1059	NUT NYLOCK 3/8-16 SS
F1140	WASHER SEALING 3/8" ID 1" OD SS
F1172	SCREW THREAD FORMING 10-32 X 1/2 HEX WASHER HEAD ZINC
F1177	BOLT HHC 3/8-16 X 2-1/2 SS
M1517	BACK PANEL CP2016
M1819	SPACER 3/8" X 1-1/2" SS
P1111	ENDSTOP PHOENIX CONTACT 3022276 CLIPFIX 35-5
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
P1228	ENCLOSURE SS 20x16x8 SLOPED TOP HOFFMAN
P1232	IEC CONTACTOR 3P 12A 24VDC COIL 1 N/O AUX CONTACT
P1361	CORD GRIP 3/4 NPT X .435-.705 BLK HEYCO M3234

Part No.	Description
P1363	CORD GRIP NUT 3/4' NPT NYLON HEYCO 8465
P1379	CIRCUIT BREAKER EATON WMZT3D04
P1380	POWER SUPPLY RHINO PSB24-060S-3
P1449	Push-Pull Pushbutton, Red, 24V
P1585	WIRE SJOOW 12AWG 4 CONDUCTOR BLACK (0.650 OD) 600V 02726.41T.01
P1819	DISCONNECT SWITCH 25A 3-POLE ALTECH KU325N
P1820	DISCONNECT HANDLE KIT ALTECH OKA/KU LK10 Y/R
P1827	VARIABLE FREQUENCY DRIVE POWERFLEX 4M 1/2 HP 480V 3PH
P1873	TERMINAL BLOCK SPRING CLAMP 5.1mm GRAY A-B 1492-L3
P1874	TERMINAL BLOCK SPRING CLAMP 5.1mm GROUND A-B 1492-LG3
P1939	RELAY, TIMER, MULTIFUNCTION 24VDC EATON TRL04
P1940	SWITCH, CURRENT SENSING WITH TIME DELAY

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

## General

## Installation

## Operation

## Configuration

## Maintenance

## Troubleshooting

## Appendix



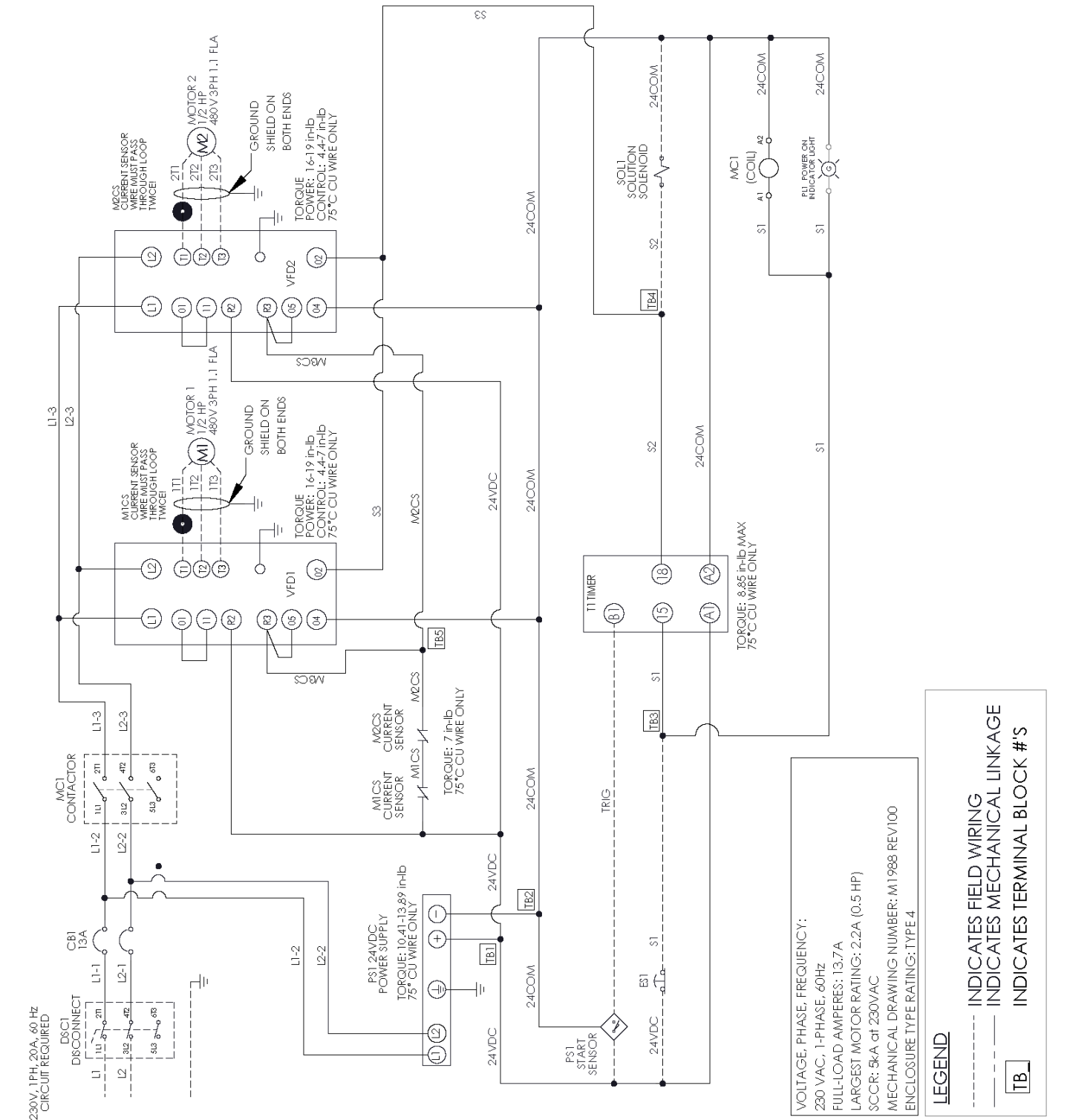
VOLTAGE, PHASE, FREQUENCY:  
115 VAC, 1-PHASE, 60HZ  
FULL-LOAD AMPERES: 19.1A  
LARGEST MOTOR RATING: 2.2A (0.5 HP)  
SCCR: 5kA @ 115VAC  
MECHANICAL DRAWING NUMBER: M1987 REV100  
ENCLOSURE TYPE RATING: TYPE 4



# USER MANUAL: BSX900-DAF

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

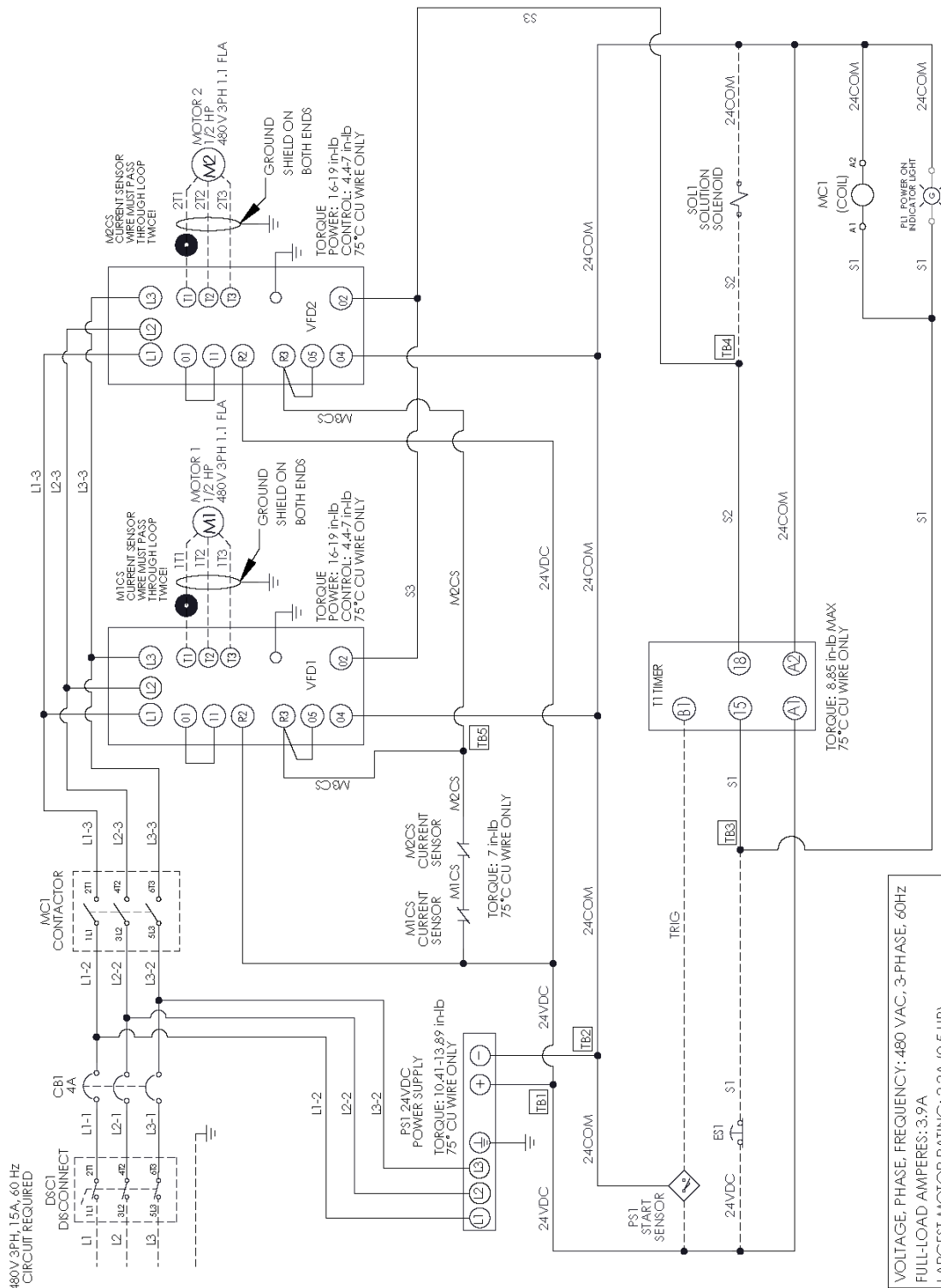
## Appendix B - Electrical Schematic (M1988 : 230V, 1PH)



# USER MANUAL: BSX900-DAF

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

## Appendix B - Electrical Schematic (M1989 : 480V, 3PH)



VOLTAGE, PHASE, FREQUENCY: 480 VAC, 3-PHASE, 60Hz  
FULL-LOAD AMPERES: 3.9A  
LARGEST MOTOR RATING: 2.2A (0.5 HP)  
SCCR: 5kA at 480VAC  
SCHEMATIC DRAWING NUMBER: ES1024 REV100  
MECHANICAL DRAWING NUMBER: M1989 REV100  
ENCLOSURE TYPE RATING: TYPE 4

**LEGEND**  
- - - INDICATES FIELD WIRING  
— INDICATES MECHANICAL LINKAGE  
[TB] INDICATES TERMINAL BLOCK #'