Proposed Meeting Agenda - REVISED
SOUTH DAKOTA ELECTRICAL COMMISSION
Microsoft Teams
Meeting ID: 293 000 310 396 8 | Passcode: vR2Qp7Xc
or Call +1 605-679-7263 ID 567 126 030#

Thursday, January 8, 2026, at 1:00 p.m. CST

A.	Call to Order	
B.	Approval of Agenda	
C.	Approval of October 9 and October 28 Minutes	
D.	Public Comment	
E.	Class B Electrician Bill	
F.	Machinery Designation Applications	
G.	Subcommittee Reports	
	i. Fee Structure	
H.	Executive Session pursuant to SDCL 1-25-2, as necessary	
I.	President's Report	Tor Sorlien
J.	Program Director's Report	Pamela Overweg
K.	Inspector's Report	Brent Schoulte
L.	Next Meeting	April 16, 2026
M.	Adjournment	

Meeting Minutes
SOUTH DAKOTA ELECTRICAL COMMISSION
via Microsoft Teams and Conference Call
Thursday, October 9, 2025, at 1:00 p.m. CDT

Director Overweg called the roll. A quorum was present.

Members Present electronically: Dave Eide, Bob Jarding, Doug Fuerst, Carl Odde
Members Absent: Tor Sorlien, Stephen Burgess

Others Present: Pamela Overweg, Program Director, Jodi Aumer, Director of Professional Licensing, Brent Schoulte, Lead Inspector, Tammi Florentz, Senior Administrative Assistant, Jennifer Doubledee, Attorney, Billy Schneider, Kim Swift, Jeff Kirstein

Jarding made the motion to appoint Dave Eide as Temporary Chair. Fuerst seconded the motion. **MOTION PASSED**.

Eide called the meeting to order at 1:03 p.m.

Odde made a motion to approve the amended agenda with Public Comment after Class B Electrician Bill. Jarding seconded the motion. **MOTION PASSED.**

Jarding made a motion to approve the July 10 Minutes. Odde seconded the motion. **MOTION PASSED.**

Doubledee reviewed open meetings laws for the board. Odde made a motion to approve review of the open meeting laws, Fuerst seconded the motion. **MOTION PASSED**.

Director Overweg explained the reciprocal requirements shared in the meeting packet including the one-year license requirement. Fuerst made a motion to approve the reciprocity requirements as written in the packet. Jarding seconded the motion. **MOTION PASSED.**

Director Overweg thanked the board for allowing her to attend the NASCLA conference and provided a report on the value of South Dakota being a member of NASCLA. Director Overweg made a request of the board to be allowed to sit on the board of directors for NASCLA. Fuerst made a motion to approve Director Overweg's request to become a NASCLA board member. Jarding seconded the motion. **MOTION PASSED.**

Director Overweg presented the board with a draft bill to discontinue the issue of Class B electrician licenses after July 1, 2026. The board tabled the discussion.

Eide asked for public comment. No public comment was received.

The remainder of the agenda items were tabled until the next meeting due to no longer having a quorum present.

Fuerst made a motion to adjourn the meeting. Odde seconded the motion. **MOTION PASSED.**

The commission adjourned the meeting at 1:34 p.m.

Meeting Minutes
SOUTH DAKOTA ELECTRICAL COMMISSION
via Microsoft Teams and Conference Call
Tuesday, October 28, 2025, at 1:30 p.m. CDT

Members Present electronically: Dave Eide, Bob Jarding, Doug Fuerst, Carl Odde, Tor Sorlien, Stephen Burgess

Others Present: Pamela Overweg, Program Director, Jodi Aumer, Director of Professional Licensing, Jennifer Doubledee, Attorney

President Sorlien called the meeting to order at 1:39 p.m.

Director Overweg called the roll. A quorum was present.

Jarding made a motion to approve the agenda. Burgess seconded the motion. **MOTION PASSED.**

President Sorlien asked for public comment. None was received.

Director Overweg presented the board with a current draft bill to discontinue the issue of Class B electrician licenses after July 1, 2026. Eide made a motion to approve for the Class B electrician bill to move to the next step. Fuerst seconded the motion. **MOTION PASSED.**

Odde made a motion to enter executive session pursuant to SDCL 1-25-2(3) to confer with legal counsel regarding contractual matters and invited Director Overweg, Jodi Aumer, and Jennifer Doubledee to join. Jarding seconded the motion. **MOTION PASSED.**

The board entered executive session at 1:46 p.m. The board exited executive session at 1:59 p.m.

Fuerst made a motion to adjourn the meeting. Burgess seconded the motion. **MOTION PASSED.**

The commission adjourned the meeting at 2:03 p.m.

2026 South Dakota Legislature

Draft 389

Requested by: at the request of the Department of Labor and Regulation

An Act to discontinue the issuance of new Class B electrician licenses.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF SOUTH DAKOTA:

Section 1. That § 36-16-2 be AMENDED:

36-16-2. Terms used in this chapter mean:

(1) "Apprentice electrician," a person learning the trade under the supervision and employment of an electrical contractor, journeyman electrician, or Class B electrician, or a person learning the trade under the supervision of a 501(d) electrician, or a person employed by a public entity or private corporation, firm or partnership who is learning the trade under the supervision of an electrical contractor or Class B electrician ~~who is~~ employed by the same public entity or private corporation, limited liability company, firm, or partnership;

(2) "Class B electrician," a person licensed under this chapter before July 1, 2026, having the necessary qualifications, training, and technical knowledge, and at least thirty-six months' experience in wiring, installing, and repairing electrical apparatus and equipment in accordance with the standard rules established by the State Electrical Commission;

(3) "Electrical contractor," a person having the necessary qualifications, training, experience, and technical knowledge to plan, lay out, and supervise the installation and repair of electrical wiring, apparatus, and equipment for electric light, heat, and power in accordance with the standard rules governing ~~such~~ the work; and who undertakes or offers to undertake with another to plan for, lay out, supervise, and install or to make additions, alterations and repairs in the installation of ~~such~~ the work;

(4) "Electrical inspector," a person experienced in all classes of electrical work and either:

(a) Is a graduate of a recognized electrical school as approved by State Electrical Commission rules and has a total of four years of experience in electrical work, excluding school experience~~,~~; or

(b) Has at least six years of practical experience in electrical wiring.

A qualified inspector may be issued an electrical contractor's license if the qualified inspector pays the necessary fees as set forth in this chapter;

(5) "Journeyman electrician," a person having the necessary qualifications, training, technical knowledge and at least four years of experience in wiring, installing, and repairing electrical apparatus and equipment in accordance with the standard rules established by the State Electrical Commission;

(6) "Maintenance electrician," a person working under a maintenance electrician's license of a public entity, firm, partnership, limited liability company, or corporation; and

(7) "501(d) electrician," a person having the necessary qualifications, training and technical knowledge in wiring, installing, and repairing electrical apparatus and equipment in accordance with the administrative rules promulgated by the State Electrical Commission, pursuant to chapter 1-26. ~~A 501(d) licensee~~, who is restricted to wiring on 501(d) properties within the State of South Dakota. ~~501(d) is the reference to the federal internal revenue code that provides the exemption for a religious or apostolic association or corporation.~~

SOUTH DAKOTA DEPARTMENT OF LABOR AND REGULATION

SOUTH DAKOTA ELECTRICAL COMMISSION

217 West Missouri Avenue, Pierre, SD 57501
Tel: 605.773.3573 Toll-Free: 1.800.233.7765 Fax: 605.773.6213 dlr.sd.gov/electrical

MACHINERY DESIGNATION APPLICATION

Entity Name: Sioux Steel Company/Koyker MFGR Contact Person: Zach Dawson

Tel: (605) 965 – 4406

Address: 415 E Industrial Ave (STREET) Lennox (CITY) SD (STATE) 57039 (ZIP)

Installation Address: : 415 E Industrial Ave (STREET) Lennox (CITY) 57039 (ZIP)

☉ Yes ○ No: Entity presents application as official notice that Entity is designating the following equipment at the installation address as machinery.

Description of Machinery:
The Laser Machine is used for a unique manufacturing process at entity's location above.
3rd Party Evaluation for UL508a, NFPA 79, and NEC 670 Compliance by Muth Power Solutions (Joshua Jay Knighton). Field Evaluation Label (FEB) with unique identifier placed on the machinery.
Specific labels for this machine include - (MPS-FEB-060018)

Name of Professional Engineer involved: Joshua Knighton License No.: 16721

Please answer the following questions:

○ Yes ◉ No: The machinery as a packaged unit is available in a listed form.

○ Yes ◉ No: Has an electrical standard been prepared or adopted to which the machinery should conform. (e.g. NRTL or NFPA 79: Electrical Standard for Industrial Machinery)

◉ Yes ○ No: The machinery is specific electrical equipment for use by the applying entity and not a line as manufactured, stored, sold, installed, or attached.

◉ Yes ○ No: A label indicating the installation complies with nationally recognized standards or tests determining suitable usage for said installation in manner utilized has been adhered to machinery by 3rd party conducting field listing.

◉ Yes ○ No: In the opinion of the Entity the machinery complies with NEC 670.

◉ Yes ○ No: Entity accepts responsibility and liability for the machinery.

◉ Yes ○ No: Entity is of the opinion the machinery is safe for the use intended.

By my signature below, I do solemnly swear the statements made herein are true and correct to the best of my knowledge and belief. Completion of this application does not guarantee approval.

Name: Rick Schaff Position: Manager

SIGNATURE DATE: 01/05/2026

To Submit: Mail or fax to the South Dakota Electrical Commission (contact information at the top of this form).

Ensure your application includes:

☑ Signature and Date
☑ Attach Stamped Engineering plans

LICENSED PROFESSIONAL ENGINEER
REG. NO. 16721
JOSHUA J. KNIGHTON
SOUTH DAKOTA

12/30/2025

Field Evaluation of Non-Listed Industrial Machinery
MPS-FEB-060018

MITSUBISHI ML3015GX-F100(D)

Koyker MFGR / Sioux Steel
221 E 11th Avenue
Lincoln County, South Dakota

Revision	Description	Date
0.0	Initial Release - **FAILED**	2025-11-24
1.0	After Corrections - **PASSED**	2025-12-30

Muth Power Solutions

Summary:

MITSUBISHI, ML3015GX-F100(D) laser equipment and **MSC Controller, PTSV3015** were installed without a recognized listing label. The panels + connected equipment was built solely for **Sioux Steel Company / Koyker MFGR** and will only be used in their production processes. South Dakota's Electrical Commission requires an application to be submitted when there is ***"No Listing on Installation"***. The requirements for the machinery designation & to be approved by the commission and authority having jurisdiction (AHJ) is as follows:

- No Standard has been prepared or adopted
- Owner states machinery is safe for intended us
- The machinery is specific electrical equipment for use by applying entity and not a line as manufactured, stored, sold, installed, or attached
- Comply with Article 670 of NFPA 70
  - Nameplate Information
  - **Provide proof of compliance with NFPA 79 by licensed professional engineer**

The intent of this report is to show the findings of the evaluation by a professional engineer. If anything was discovered to be non-compliant, it'll be listed in the ***Observations Log*** at the end of the report. Any issues discovered that require corrective actions must be corrected before a final report will be sent to the South Dakota Electrical Commission and the Field Evaluation Body (FEB) label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

In compliance with NFPA 791, Muth Power Solutions (M.P.S) generated a unique serial number for the FEB label: **MPS-FEB-060018**. This serial number will be referenced on the machine label as well as in this evaluation report once the machinery is compliant with applicable standards.

Any performance testing is outside the scope and was not performed during this evaluation.

The following versions of codes / standards were used for this evaluation

- NFPA 70 National Electrical Code (2020)
- NFPA 79 Electrical Standard for Industrial Machinery (2024)
- NFPA 790 Competency of Third-Party Field Evaluation Bodies (2024)
- NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment (2024)

Overall Result of Evaluation:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of NFPA 70, Article 670:

Definition of Industrial Machinery [NFPA 70, Article 670.2]

A power-driven machine (or a group of machines working together in a coordinated manner), not portable by hand while working, that is used to process material by cutting; forming; pressure; electrical, thermal, or optical techniques; lamination; or a combination of these processes. It can include associated equipment used to transfer material or tooling, including fixtures, to assemble/disassemble, to inspect or test, or to package [The associated electrical equipment, including the logic controller(s) and associated software/logic together with the machine actuators and sensors, are considered as part of the industrial machine]

- **Per the definition above, the MITSUBISHI equipment in this report should be classified as industrial machinery**
  - The machine is used to process material by cutting techniques using laser technology. It also includes equipment to transfer the metal from process to process

Nameplate Data [NFPA 70, Article 670.3(A)]

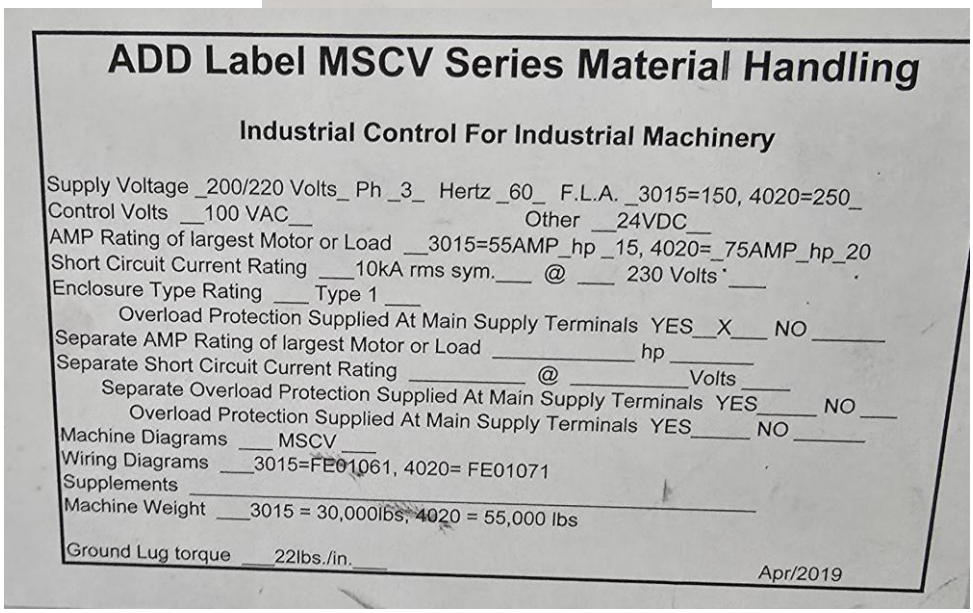
The nameplate must be attached to the control equipment enclosure or machine with the following information. There are (2) cabinets that have a separate supply circuit.

Laser Processing Machine Enclosure

- Supply Voltage: **208V**
- Number of Phases: **3 Phase**
- Frequency Rating: **60 Hz**
- Full-Load Current: **46 kVA (128 Amps)**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: Multiple, but shows supply at 46 kVA
- Electrical Drawing Number: Multiple Drawings for the machine

MSC Controller Enclosure

- Supply Voltage: **208V**
- Number of Phases: **3 Phase**
- Frequency Rating: **60 Hz**
- Full-Load Current: **65 kVA (180 Amps)**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: Multiple, but shows supply at 65 kVA
- Electrical Drawing Number: Multiple Drawings for the machine



MSC Sub Panel (Tower Control Box)

- Supply Voltage: **208V**
- Number of Phases: **3 Phase**
- Frequency Rating: **60 Hz**
- Full-Load Current: **42 Amps**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **11 kW**
- Electrical Drawing Number: **FE01061-20**

MSC Sub Panel (Box21L)
- Supply Voltage: **208V**
- Number of Phases: **3 Phase**
- Frequency Rating: **60 Hz**
- Full-Load Current: **15.3 Amps**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **2.2 kW**
- Electrical Drawing Number: **FE01061-01**

MSC Sub Panel (Cart Control Box)
- Supply Voltage: **208V**
- Number of Phases: **3 Phase**
- Frequency Rating: **60 Hz**
- Full-Load Current: **5.6 Amps**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **0.4 kW**
- Electrical Drawing Number: **FE01061-42 & 43**

Corrective Action was Required
- Each sub-panel was missing a nameplate, and one was placed on the enclosures with the information above after the initial report was released

Supply Conductors [NFPA 70, Article 670.4(A)]

The supply conductors must have an ampacity rating not less than

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

- The machine has appropriate supply conductors to each electrical enclosure

Laser Processing Machine Enclosure
- The total load is shown as 46 kVA on the nameplate. 46 * 1.25 = 57.5
- With a supply voltage of 208V/3ph, this results in 159.6A
- The supply conductors are 3/0 CU, which are rated for 200A @ 75 Deg, so this is compliant since the feeder breaker is 200A

MSC Controller Enclosure
- The total load is shown as 65 kVA on the nameplate.
- With a supply voltage of 208V/3ph, this results in 180.4A
- The supply conductors are 3/0 CU, which are rated for 200A @ 75 Deg, so this is compliant since the feeder breaker is 200A & the disconnect/breaker inside is only 150A

MSC Controller (Sub Panel Tower Control Box)
- The total load was calculated to be 13.5 kW & PF around 0.8 to 0.83
- With a supply voltage of 208V/3ph, this results in 42A
- The supply conductors to this enclosure appear to be #6 CU, which are rated for 65A @ 75 Deg, so this is compliant

MSC Controller (Sub Panel Box 21L) – Feeds the Vacuum ASSY Motors
- The total load was calculated to be 4.4 kW & PF around 0.8

- With a supply voltage of 208V/3ph, this results in 15.3A
- The supply conductors to this enclosure appear to be #12 CU, which are rated for 25A @ 75 Deg, so this is compliant

MSC Controller (Sub Panel Cart Control Box)

- The total load was calculated to be 1.6 kW & PF around 0.9
- With a supply voltage of 208V/3ph, this results in 5.66A
- The supply conductors to this enclosure appear to be #12 CU, which are rated for 25A @ 75 Deg, so this is compliant

Disconnecting Means [NFPA 70, Article 670.4(B)]

The electrical enclosure must have a disconnecting means since the machine is considered an individual unit. It is not required to have integral overcurrent protection.

- The panels are compliant with NEC 670 for disconnecting means

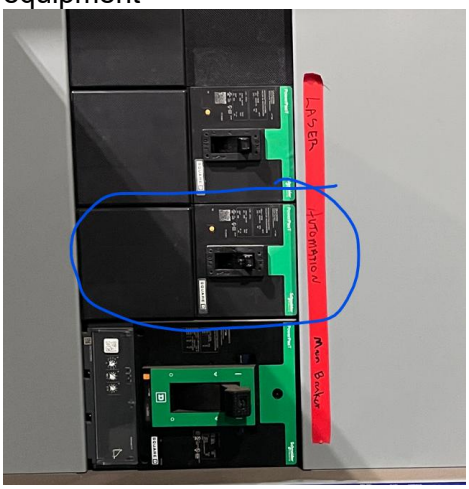
Laser Machine

- The disconnecting means is a distribution panel + 200A 3ph breaker located within sight of the laser equipment

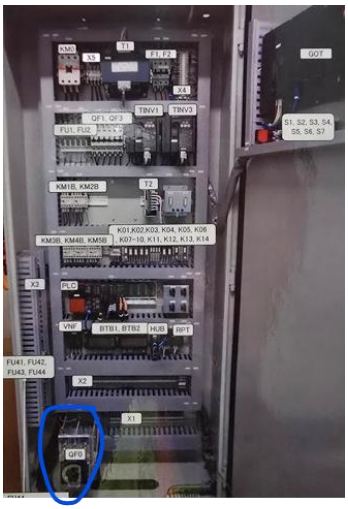
- There is also a disconnect on the control panel for the laser machine

MSC Controller

- The disconnecting means is a distribution panel + 200A 3ph breaker located within sight of the laser equipment



- There is also a disconnect integral on the MSC control panel



- Sub – Panel : Tower Control Box
  - This panel is disconnected from MSC via a contactor. If power is lost, or the MSC is locked out, the tower control box shuts off too

- Sub – Panel : Box 21L
  - This panel is disconnected from MSC since it's hardwired to the box
- Sub – Panel : Cart Control Box
  - This panel is disconnected from MSC since it's hardwired to the box

Overcurrent Protection [NFPA 70, Article 670.4(C)]

The electrical enclosure must have a single feeder circuit breaker or fuses when furnished as part of an industrial machine. The rating of the overcurrent device shall be sized on sum of (if not noted on the enclosure door for FLA)

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

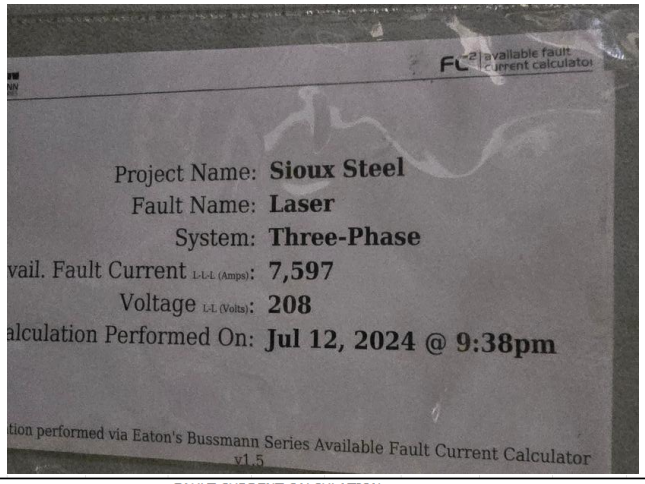
The laser machine is supplied from a 200A circuit breaker with 3/0 CU conductors & are landed on a disconnect + 175A breaker. This is compliant with NEC.

The MSC controller is supplied from a 200A circuit breaker with 3/0 CU conductors & are landed on a 150A breaker / disconnect inside the enclosure. This is compliant with NEC. The MSC controller then feeds (3) sub-panels. All feeds have appropriate over current protection

Short Circuit Current Rating [NFPA 70, Article 670.5]

The electrical enclosure must not be installed in a location where the maximum available fault current exceeds the nameplate rating.

- The fault current was calculated from the main utility TX down to the distribution panel that feeds the laser machine to ensure each electrical panel had appropriate SCCR of 10 kAIC. The equipment's SCCR exceeded the maximum available fault current calculated at the line terminals of each panel. There was another calculation posted on the panel that showed 7,597 A. The calculation performed during this evaluation resulted 6,657A. Either way, the machine has appropriate SCCR and is in compliance with the standards.



FAULT CURRENT CALCULATION

Utility XFMR Rating:	500 kVA	Transformer Phase:	3	Impedance (%Z):	1.80%	Fault Current (Inf. Bus):	33411.47 A	Utility XFMR Secondary Voltage	480								

Panel or Transformer Name	Feeder Length in Feet "L"	Upstream Available Fault Current "I"	Wire Material	Wire Size	Conduit Type	(Based on Wire and Conduit) "C"	Line-to-Line Voltage "E"	Number of Conductors "n"	f = √3 x L x I n x C x E	Total Available Fault Current Itot=Isc+Isy m(mot.cont.)	Transformer KVA	Transformer %Z	Transformer Phase	Transformer Primary Voltage	Transformer Secondary Voltage	f = Isc x Vprim x √3 x (%Z) 100,000 x KVAtrans	M = 1 / 1 + f	Transformer Secondary Available Fault Current Isc(secondary)= (Vprim/Vsecondary) x M x Isc(primary)
CT	50	33,411	COPPER	350 MCM	STEEL	19703	480	4	0.08	**31037**								
MSB	45	31,037	COPPER	350 MCM	STEEL	19703	480	4	0.06	**29172**								
Bus Duct Disconnect	250	29,172	COPPER	350 MCM	STEEL	19703	480	2	0.67	**17491**								
TR-LZR 2	180	17,491	COPPER	350 MCM	STEEL	19703	480	1	0.58		225	4.38	3	480	208	1.80	0.36	**9158**
208V Panel	10	9,158	COPPER	350 MCM	STEEL	19703	208	2	0.02	**8984**								
CNC Lazer	60	8,984	COPPER	3/0 AWG	STEEL	12843	208	1	0.35	**6657**								
MSC Controller	60	8,984	COPPER	3/0 AWG	STEEL	12843	208	1	0.35	**6657**								

Surge Protection [NFPA 70, Article 670.6]

The electrical enclosure shall have proper surge protection if the upstream supply circuit does not protect the enclosure

- Upstream MSB has integral surge protection and protects the facility from over voltages / surges on the service

NFPA 70, Article 670 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of UL508A:

Part 2 Enclosures
The enclosure shall have the proper rating for the environment it is installed in. It shall be constructed to support the weight within as well as the environmental forces such as wind & snow. It shall have appropriate markings to indicate manufacturer's intent.

Part 2 Industrial Machinery
Shall comply with NFPA 79 and other standards listed in sections 65 to 67

UL508A Compliance Result:
☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Construction Requirements of NFPA 79:

System must comply with sections 4 – 17 of NFPA 79. Some of the higher priority requirements are summarized below that are accompanied with onsite pictures of the actual gear. Other specific sections/requirements will be called out as needed, if it's applicable to the equipment being evaluated.

Electrical Supply
The system shall be able to operate within 90%-110% of voltage rating, 99%-101% frequency rating, and harmonic THD of 0%-10% for short periods of time.

- The supply was measured & it is within these ranges so it is compliant with NFPA 79

Environmental
The system shall be protected from the environment it is installed within.

- The enclosures are all compliant with the area they're installed in

Available Fault Current
The system shall have a larger withstand short circuit rating than the maximum available fault current on the line terminals of the system's disconnecting means.

- See NEC 670 section above for compliance

Disconnecting Means
The system shall have a single disconnecting means from the single supply circuit wherever possible. The line side must be protected from unintentional direct contact by users when the enclosure door is opened. A disconnecting means is not required for circuits less than 50VAC RMS or 60VDC. Where each machine has multiple supply circuits for individual control panels, each machine supply circuit disconnecting means shall be legibly marked as "Machine Supply Circuit Disconnecting Means" and it must note the location of the other machine disconnecting means for any other supply circuit.

- See NEC 670 section above for compliance
- Each enclosure has a single disconnecting means that is compliant with NFPA 79

Corrective Action was Required

- There are multiple supply circuits, so each disconnect must have a label showing the LOTO method for the machine. The label must show the number of disconnects (ex: 1 of 2) and show where the other disconnects are & what they're labeled. This will help make it safe for someone to work on the machine in the locked out state
    - This was corrected after the initial report was released & there are proper labels now

Protection from Electrical Hazards

The system shall have live parts insulated from users and openings/windows must meet UL requirements. It must have integral fault protection for accidental connections to live parts. Any interlocked electrical supply circuits must be indicated on the enclosure with a warning placard. An arc flash hazard warning placard must be placed on the enclosures with live electrical present.

Protection of Equipment

The system may have some of the following protection in order to protect the equipment

- Overcurrent
- Overloads for motors
- Ground fault
- Overvoltage
- Abnormal temperature
- Incorrect phases or loss of phases
- Overspeed of machines

- The electrical enclosures have appropriate protection and were observed to be operating in a normal manner & nothing was overheating. Everything appears to be compliant with NFPA 79

Laser Machine

- The incoming supply has appropriate surge protection from an upstream panel
- The supply is protected with a 175A circuit breaker
- The other circuits have appropriate overcurrent protection
- The DC power supplies have integral surge protection that protects the PLC & safety components
- The ground is being monitored for laser protection reasons / EMI & there is an isolated ground / single connection to earth

MSC Controller

- The incoming supply has appropriate surge protection from an upstream panel
- The supply is protected with a 150A circuit breaker

- The VFD has EMC filter protection

- The components are appropriate overcurrent protection

- The DC 24VDC has integral surge protection that protects the PLC & safety components

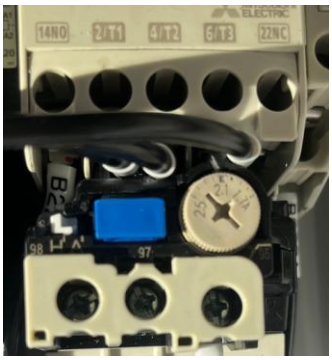
MSC Sub Panel : Box 21L

- The contactors are protected upstream in the MSC controller since this box was intended to be close to the vacuum assembly motors

MSC Sub Panel : Cart Control

- The supply is protected with a 20A circuit breaker

- Each motor is protected with an overload set at 2.1A

- 

MSC Sub Panel : Tower Control

- The supply is protected with a 50A contactor
- The VFD is protecting the motor with overload

- Each device has appropriate overcurrent protection

Grounding & Bonding

The system shall be installed in accordance with NFPA 70, Article 250 for grounding & bonding. The equipment grounding conductor must be identified with the word “GROUND” or be identified with the GND symbol.

Laster Machine

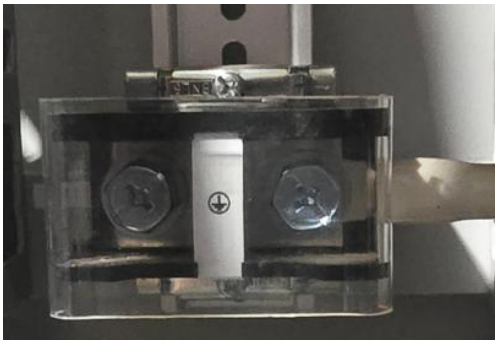
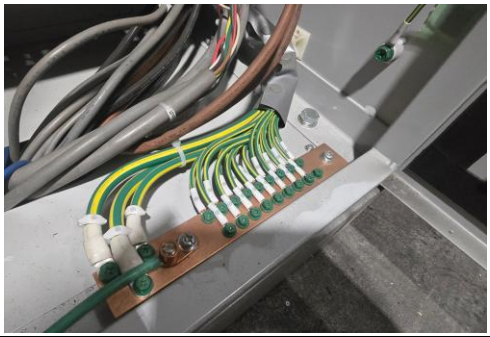
- The panel is bonded appropriately & has the ground symbols

Corrective Action was Required

- The isolated ground did not have green insulation & it wasn't protected in a non-metallic sleeve. This was corrected after the initial report, so the insulation & protective sleeve are compliant with the NEC now

MSC Control Panel

- The panel is bonded appropriately & has the ground symbols

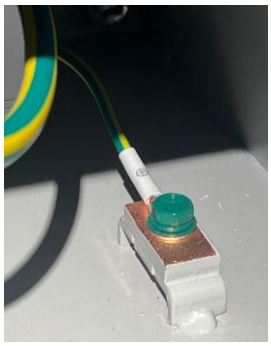




MSC Sub Panel : Cart Control

- The panel is bonded appropriately

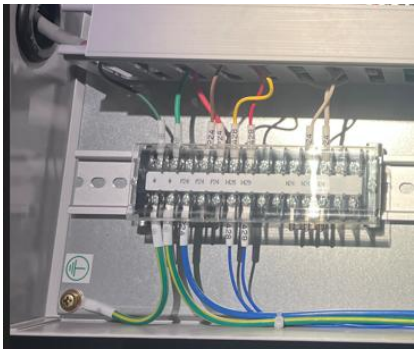

MSC Sub Panel : Tower Control

- The panel is bonded appropriately

MSC Sub Panel : Box 21L

- The panel is bonded appropriately

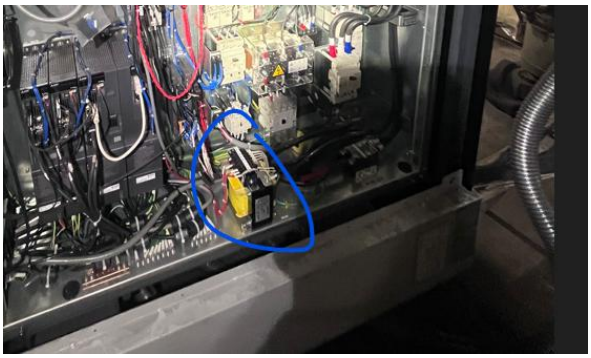
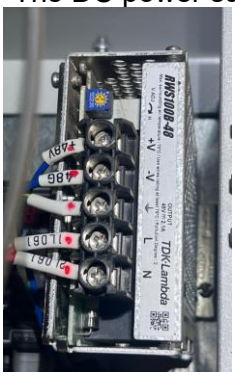



Control Circuits & Control Functions

The AC control circuit must come from a control transformer must not exceed 120VAC & maximum 1kA available fault current. Any DC control circuit must be less than 250 VDC. All control circuits must have overcurrent protection. All safety/start/stop functions must work as intended. Interlocks shall be in place to ensure machine fails safely. Emergency stops shall keep the machinery de-energized until safety conditions are reset (shouldn't restart, but act as a permissive to the machinery)

- Control circuits were tested in the MSC controller + downstream panels. They work as intended and are compliant. The MSC controller + sub panels are derived from a control XFMR and have a 120V secondary. The 24VDC loads are protected from overvoltage via the integral surge / over voltage protection on the power supply

- Control circuits were tested in the laser panel. They work as intended and are compliant. There is a control XFMR in the panel for control circuits. The DC power supply has overvoltage protection

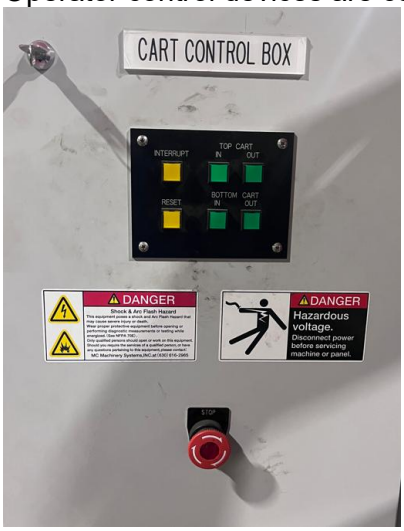



Operator Interface and Control Devices

The operator interface must be readily accessible to the machine. Control devices must be mounted securely / installed in compliance with the manufacturer and they must be protected from accidental operation / false signal to the machine. Color indicators shall be the following colors for each function:

- **Start or Normal Conditions** (Green but Black, White, or Gray)
- **Stop** (Red but Black, White, or Gray is permitted for non-emergencies)
- **Emergency Stop or Emergency Conditions** (Red)
  - Must be RED with Mushroom-head Type & yellow background for pushbutton-operated switches. Pull-cord operated switches are also valid.
- **Abnormal Conditions** (Yellow or Amber)
- **Push-Button that Causes Movement** (Black, but White, Gray, Blue is permitted)
- **Push-Button for Resets** (Blue, but Black, White, Gray, and RED if stop/emergency reset)
- **Mandatory Conditions** (Blue)
- **Neutral Conditions** (White)

  - Operator control devices are compliant with the color codes & NFPA 79



Control Equipment: Location, Mounting, and Enclosures

All enclosures must be mounted so it allows maintenance, protection against environmental influences, and allows normal operation of the machinery. Exposed, live electrical terminations must be protected. Mechanical tubing, piping, valves, etc to handle gas, liquid, or air must not be located within the enclosure. Electrical working spaces defined in NFPA 70, Article 110 shall be followed for the enclosure and its doors.

- All equipment is mounted in compliance with NFPA 79. There are not any process lines in the enclosures

Conductors, Cables, and Flexible Cords

All cabling/conductors shall be identified and installed in accordance with their intended use. Conductors must be copper with appropriate insulation and ampacity rating not less than 125% of the full load current

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

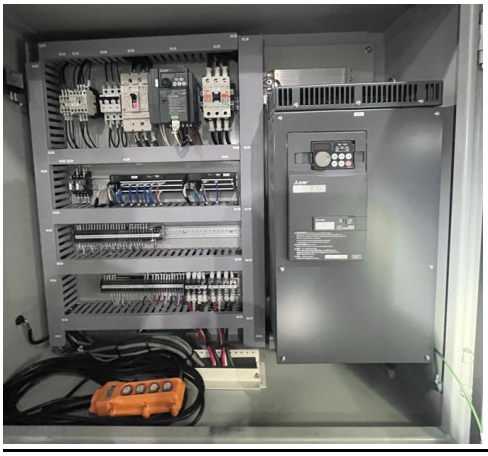
The ampacity rating must take into account deration factors such as more than three current-carrying conductors in raceway, temperature, buried, etc. The wire's insulation shall be rated for all voltage levels present within the raceway.

- All conductors are installed & sized in compliance with NFPA 79

Wiring Practices

All connections must be installed so it prevents accidental loosening. Terminals must be rated for the wire and labeled clearly. In no instance shall the wire cross over the terminals for panel/field wiring. Wires shall be run from source to destination without splices or joints within the enclosure. If an enclosure is supplied from more than one power source, the power wiring must be run in separate raceways for each disconnecting means. Exposed cables are permitted along machinery supports, but care should be taken to ensure the cabling doesn't inhibit maintenance (machine guards, grease ports, gauges, etc). Cabling must be supported adequately so sagging or damage doesn't occur. Cables subjected to damage must be protected and installed in compliance with NFPA 70. Grounding conductors must be identified by color green with or without yellow stripes.

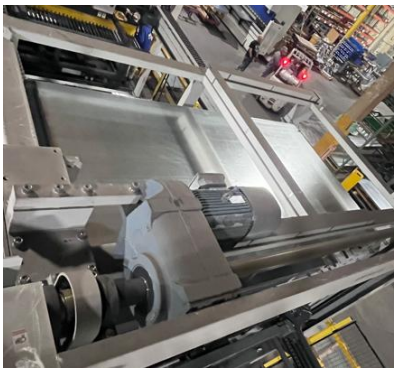
- Terminations were done in a professional manner & labels are clear when you open the enclosures. No joints / splices were observed. Each enclosure has single supply and have appropriate disconnects. The installation is in compliance with NFPA 79

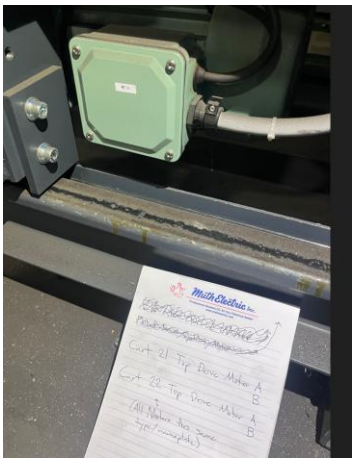


Electric Motors and Associated Equipment

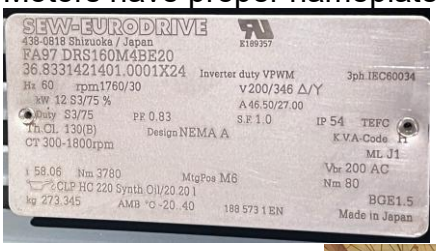
All motors shall be mounted so they are adequately protected from damage, accessible for maintenance, have proper cooling, and can be easily replaced. Motors shall be selected to match the connected process conditions. Motors must have nameplate data marked in compliance with NFPA 70, Article 430, and they must have appropriate motor controllers and protection.

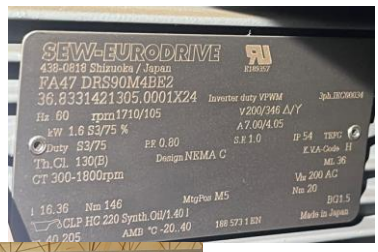
- Motors are mounted in compliance with NFPA 79

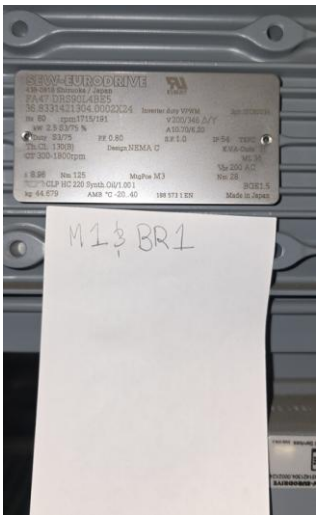


- Motors have proper nameplate data on them







Receptacles and Lighting

Receptacles for machinery must be GFCI-protected, supplied from grounded 120V source, have proper overcurrent protection, and be rated to withstand the environment it is installed in. Only lighting systems designed for use greater than 150V may be permitted; otherwise, lighting systems should be 120V for machinery. Lighting must have overcurrent protection, must not exceed 15 Amps, and must be rated for the physical environment.

- Not applicable since receptacles were not observed onsite

Marking and Safety Signs

The equipment must be marked with supplier's name, trademark, and identifying symbol. Safety placards and markings must be permanent.

- Warning Label – *Potential Electric Shock and Arc Flash Hazard*
  - Place visibly on Enclosure when Voltage is greater than 50VAC or 60VDC

- Warning Label – *Does Not De-Energize All Exposed Parts When Disconnecting Means in (off) Position*
  - Place visibly on Enclosure next to disconnect when multiple sources are present

- Warning Label – *Power Shall Be Disconnected from Equipment Prior to Opening Enclosure Door*
  - Place visibly on Enclosure when an attachment plug is used as disconnecting means

Overall Machine

- The machine has warning placards placed all around the machine to let operators know where danger is present. The machine also has appropriate guards + safety sensors


MSCV3015
MAX.LOAD WEIGHT 6600 lbs/PALLET
MATERIAL THICKNESS 1/32"-1"

Laser Machine

- The enclosure has appropriate warning placards

MSC Controller

- The enclosure has appropriate warning placards

MSC Sub Panel : Cart Control Box

- The enclosure has appropriate warning placards

MSC Sub Panel : Tower Control Box

- The enclosure has appropriate warning placards

MSC Sub Panel : Box21L

- The enclosure has appropriate warning placards

- Nameplate
  - Required by manufacturer
    - Name of Supplier

- Model, Serial Number, etc
- Rated voltage, phase, frequency, and full-load current for each supply
- Largest Motor or Load
- Max Protective Device Threshold
- Short Circuit Current Rating
- Electrical Diagram Number(s) or Drawing Index

- Refer to NEC 670 section above for nameplate notes

Technical Documentation
The machinery must have necessary information present for installation, operation, maintenance, and storage of the machine. This can be in the form of drawings, diagrams, charts, tables, etc. It must be stored onsite with the machine.

Corrective Action Was Required

- Technical drawings / documentation was not stored with the machine onsite. This information was printed off after the initial report & is now stored with the machine onsite

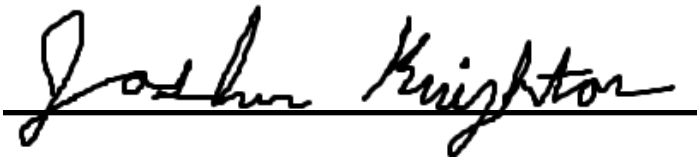
NFPA 79 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

I hereby certify that I am a professional engineer, registered in the State of South Dakota and I do not benefit financially by the sale/manufacturing of the equipment evaluated within this report, I did not impose excessive financial preconditions to evaluate the equipment, and there were not any conflicts of interests in performing the evaluation. I attest that the evaluation and report was performed by me personally and is to the best of my knowledge complete and accurate.



December 30, 2025

Date:

Joshua J. Knighton
Professional Engineer

Observation Log:

During the evaluation, differences between the observed installation and the governing standards are logged here with recommended actions to correct the issue (if required).

Any issue discovered that requires corrected actions must be corrected and re-evaluated before a final report will be sent to the Electrical Commission and the FEB label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

Observation Log			
Non-Compliance Issue No.	**Standard/Code Reference**	**Issue**	**Corrective Action Required**
1	NFPA 79	Multiple supply circuits to the machine & there isn't proper marking/label that shows the location + quantity of other disconnects on the machine	YES – put markings at the laser machine disconnect (1 of 2) & the MSC controller (2 of 2). Label must show LOTO procedure & call out (1 of 2 or 2 of 2 disconnects) at each location, so an operator can safely LOTO the machine **Corrected December 2025**
2	NEC 670	The sub enclosures from MSC controller are missing nameplates (Tower Control Box, Box21L, Cart Control Box)	YES – put permanent nameplates on each enclosure that has the appropriate information shown in this report & compliant with NEC 670 **Corrected December 2025**
3	NFPA 79	Technical documentation	YES – make sure all technical information is stored with the machine onsite **Corrected December 2025**
4	NEC	Laser machine's isolated grounding electrode is not green insulation & not protected in non-metallic raceway	YES – Use green insulation & protect conductor in non-metallic raceway up to machine **Corrected December 2025**
5	NEC	EMT support from the disconnect to the machine panel is longer than 10'.	YES – an additional support should be added, so any of the support to support distances are less than 10' **Corrected December 2025**

SOUTH DAKOTA DEPARTMENT OF LABOR AND REGULATION

SOUTH DAKOTA ELECTRICAL COMMISSION

217 West Missouri Avenue, Pierre, SD 57501
Tel: 605.773.3573 Toll-Free: 1.800.233.7765 Fax: 605.773.6213 dlr.sd.gov/electrical

MACHINERY DESIGNATION APPLICATION

Entity Name: Henkel Contact Person: Kevin Erickson

Tel: (605) 582 – 7803

Address: 600 E Willow St (STREET) Brandon (CITY) SD (STATE) 57005 (ZIP)

Installation Address: : 600 E Willow St (STREET) Brandon (CITY) 57005 (ZIP)

☉ Yes ○ No: Entity presents application as official notice that Entity is designating the following equipment at the installation address as machinery.

Description of Machinery:
The Mill Machine is used for a unique manufacturing process at entity's location above.
3rd Party Evaluation for UL508a, NFPA 79, and NEC 670 Compliance by Muth Power Solutions (Joshua Jay Knighton). Field Evaluation Label (FEB) with unique identifier placed on the machinery.
Specific labels for this machine include - (MPS-FEB-060017)

Name of Professional Engineer involved: Joshua Knighton License No.: 16721

Please answer the following questions:

○ Yes ◉ No: The machinery as a packaged unit is available in a listed form.

○ Yes ◉ No: Has an electrical standard been prepared or adopted to which the machinery should conform. (e.g. NRTL or NFPA 79: Electrical Standard for Industrial Machinery)

◉ Yes ○ No: The machinery is specific electrical equipment for use by the applying entity and not a line as manufactured, stored, sold, installed, or attached.

◉ Yes ○ No: A label indicating the installation complies with nationally recognized standards or tests determining suitable usage for said installation in manner utilized has been adhered to machinery by 3rd party conducting field listing.

◉ Yes ○ No: In the opinion of the Entity the machinery complies with NEC 670.

◉ Yes ○ No: Entity accepts responsibility and liability for the machinery.

◉ Yes ○ No: Entity is of the opinion the machinery is safe for the use intended.

By my signature below, I do solemnly swear the statements made herein are true and correct to the best of my knowledge and belief. Completion of this application does not guarantee approval.

Name: Rick Schaff Position: Manager

SIGNATURE

01/05/2026
DATE

To Submit: Mail or fax to the South Dakota Electrical Commission (contact information at the top of this form).

Ensure your application includes:

☑ Signature and Date
☑ Attach Stamped Engineering plans

Field Evaluation of Non-Listed Industrial Machinery
MPS-FEB-060017

RELIABLE RUBBER & MACHINERY COMPANY (6058)

LICENSED PROFESSIONAL ENGINEER
REG. NO. 16721
JOSHUA J. KNIGHTON
SOUTH DAKOTA

11/24/2025

Henkel
600 E Willow St
Minnehaha County, South Dakota

Revision	Description	Date
0.0	Initial Release - **FAILED**	2025-11-13
1.0	Corrections Made - Passed	2025-11-24

Muth Power Solutions

Summary:

RELIABLE RUBBER & MACHINERY COMPANY, (6058) panel + connected equipment was installed without a recognized listing label. The panel + connected equipment was built solely for **Henkel** and will only be used in their production processes. South Dakota's Electrical Commission requires an application to be submitted when there is ***"No Listing on Installation"***. The requirements for the machinery designation & to be approved by the commission and authority having jurisdiction (AHJ) is as follows:

- No Standard has been prepared or adopted
- Owner states machinery is safe for intended us
- The machinery is specific electrical equipment for use by applying entity and not a line as manufactured, stored, sold, installed, or attached
- Comply with Article 670 of NFPA 70
  - Nameplate Information
  - **Provide proof of compliance with NFPA 79 by licensed professional engineer**

The intent of this report is to show the findings of the evaluation by a professional engineer. If anything was discovered to be non-compliant, it'll be listed in the ***Observations Log*** at the end of the report. Any issues discovered that require corrective actions must be corrected before a final report will be sent to the South Dakota Electrical Commission and the Field Evaluation Body (FEB) label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

In compliance with NFPA 791, Muth Power Solutions (M.P.S) generated a unique serial number for the FEB label: **MPS-FEB-060017**. This serial number will be referenced on the machine label as well as in this evaluation report once the machinery is compliant with applicable standards.

Any performance testing is outside the scope and was not performed during this evaluation.

The following versions of codes / standards were used for this evaluation

- NFPA 70 National Electrical Code (2020)
- NFPA 79 Electrical Standard for Industrial Machinery (2024)
- NFPA 790 Competency of Third-Party Field Evaluation Bodies (2024)
- NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment (2024)

Overall Result of Evaluation:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of NFPA 70, Article 670:

Definition of Industrial Machinery [NFPA 70, Article 670.2]

A power-driven machine (or a group of machines working together in a coordinated manner), not portable by hand while working, that is used to process material by cutting; forming; pressure; electrical, thermal, or optical techniques; lamination; or a combination of these processes. It can include associated equipment used to transfer material or tooling, including fixtures, to assemble/disassemble, to inspect or test, or to package [The associated electrical equipment, including the logic controller(s) and associated software/logic together with the machine actuators and sensors, are considered as part of the industrial machine]

Nameplate Data [NFPA 70, Article 670.3(A)]

The nameplate must be attached to the control equipment enclosure or machine with the following information

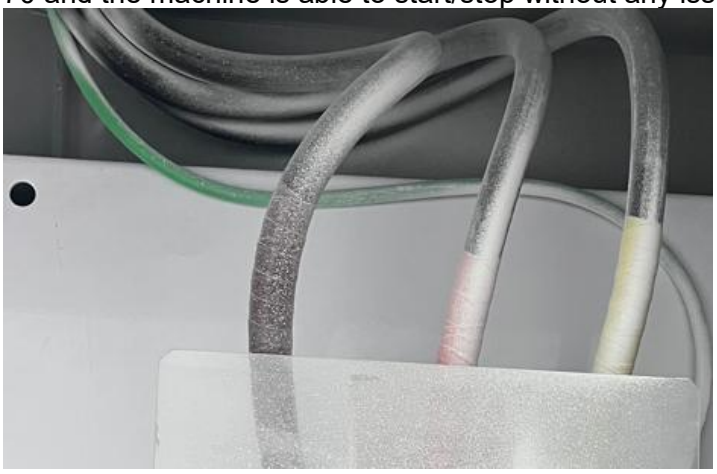
- Supply Voltage: **460 VOLT**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **188A**
- Short Circuit Current Rating: **100 KAIC**
- Largest Motor or Load: **150 HP**
- Electrical Drawing Number: **6058-E-22**

Supply Conductors [NFPA 70, Article 670.4(A)]

The supply conductors must have an ampacity rating not less than

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

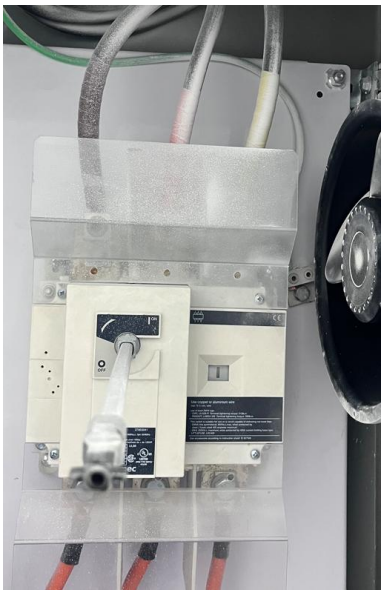
- The supply conductors are rated appropriately. The feeder breaker is 225A. This is adequate by NFPA 70 and the machine is able to start/stop without any issues.



Disconnecting Means [NFPA 70, Article 670.4(B)]

The electrical enclosure must have a disconnecting means since the machine is considered an individual unit. It is not required to have integral overcurrent protection.

- The machine has a single disconnecting means via fused disconnect.

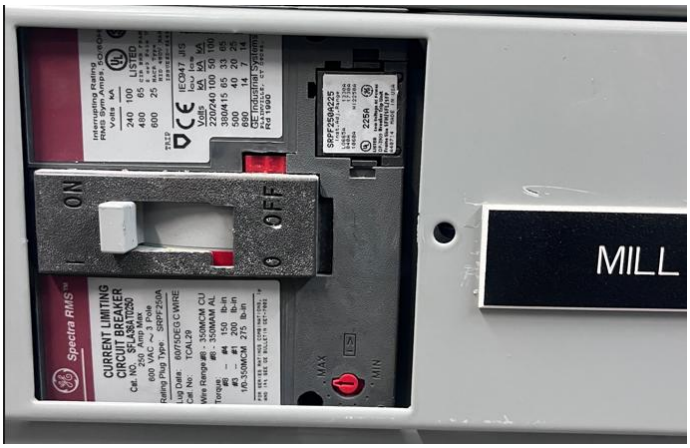


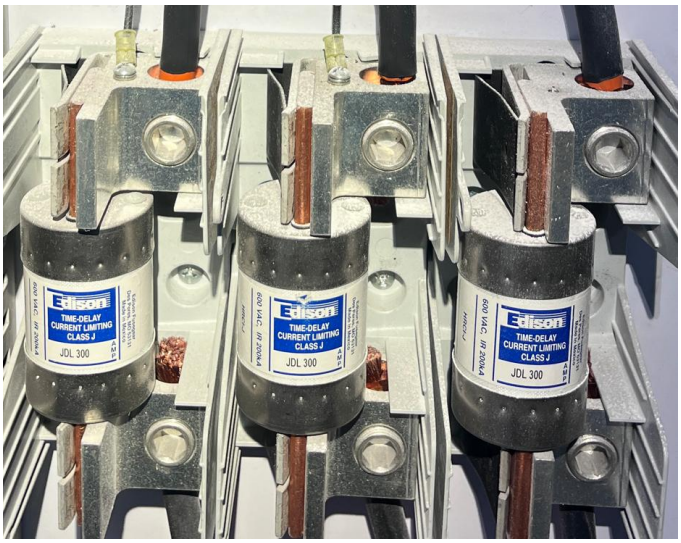
Overcurrent Protection [NFPA 70, Article 670.4(C)]

The electrical enclosure must have a single feeder circuit breaker or fuses when furnished as part of an industrial machine. The rating of the overcurrent device shall be sized on sum of

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

- The supply conductors are adequate and the machine is fed from a single breaker, which is 225A. This is adequate by code. The machine has a single disconnecting means with a fused disconnect + 300A fuses. This is okay since the machine is able to start/stop fine with the upstream 225A breaker.





Short Circuit Current Rating [NFPA 70, Article 670.5]

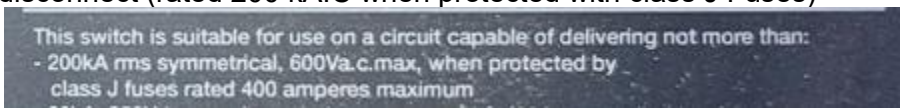
The electrical enclosure must not be installed in a location where the maximum available fault current exceeds the nameplate rating.

- The maximum available fault current was calculated to be less than 10 kA at this node, and the gear is rated for at least 100 kAIC, so the design is compliant

FAULT CURRENT CALCULATION

Utility XFMR Rating:	750 kVA	Transformer Phase:	3	Impedance (%Z):	6.03%	Fault Current (Inf. Bus):	14960.36 A	Utility XFMR Secondary Voltage	480									

Panel or Transformer Name	Feeder Length in Feet "L"	Upstream Available Fault Current "I"	Wire Material	Wire Size	Conduit Type	(Based on Wire and Conduit) "C"	Line-to-Line Voltage "E"	Number of Conductors "n"	f = √3 x L x I / n x C x E	Total Available Fault Current Itot=Isc+Isym (mot.cont.)	Transformer KVA	Transformer %Z	Transformer Phase	Transformer Primary Voltage	Transformer Secondary Voltage	f = Isc x Vprim x √3 x (%Z) / 100,000 x KVAtrans	M = 1 / 1 + f	Transformer Secondary Available Fault Current Isc(secondary)= (Vprim/Vsecondary) x M x Isc(primary)
MSB	110	14,960	ALUMINUM	750 MCM	NON-MAGNETIC	23491	480	10	0.03	14592								
FD-2	190	14,592	COPPER	4/0 AWG	STEEL	15082	480	1	0.66	8773								
Roll Mill	15	8,773	COPPER	4/0 AWG	STEEL	15082	480	1	0.03	8505								

- The equipment within the panel results in a rating of 100 kAIC
  - Fused disconnect (rated 200 kAIC when protected with class J Fuses)
    - 

  - Control XFMR protected by fuses with 200 kAIC rating

  - VFD (rated 100 kA when protected by fuses)

460V Class GS4 Specifications – Constant & Variable Torque
Frame Sizes E, F, G (125hp–300hp)

				GS4-4125	GS4-4150	GS4-4175	GS4-4200	GS4-4250	GS4-4300
Model Name									
Price				$9,037.50	$10,170.50	$12,111.50	$13,867.00	$18,993.00	$22,173.00
Frame Size				E		F		G	
Output Rating	Constant Torque (CT)	Max Motor Output	hp	125	150	175	215	250	300
			kW	90	110	132	160	185	220
		Rated Output Capacity	kVA	136	167	197	235	280	348
		Rated Output Current	A	171	209	247	295	352	437
		Carrier Frequency	kHz	2 to 6					
	Variable Torque (VT)	Max Motor Output	hp	125	150	175	215	250	300
			kW	90	110	132	160	185	220
		Rated Output Capacity	kVA	143	175	207	247	295	367
		Rated Output Current	A	180	220	260	310	370	460
		Carrier Frequency	kHz	2 to 9					
Input Rating *	CT	Rated Input Current	A	159	197	228	285	361	380
	VT			167	207	240	300	380	400
	Rated Voltage/Frequency			3-phase 380–480 VAC (-15% to +10%), 50/60Hz					
	Operating Voltage Range			323–528 VAC					
	Frequency Tolerance			47–63 Hz					
	Short Circuit Withstand (SCCR) (A, rms symmetrical)			100kA					
IE2 Efficiency - Relative Power Loss				1.2%	1.2%	1.3%	1.3%	1.4%	1.5%
Weight (kg [lb])				64.8 [143]		86.5 [191]		134 [295]	
Watt Loss @ 100% I (W) **				2092	2599	3081	3783	4589	5772
Cooling Method				fan					
Dynamic Braking				optional					
DC Choke				built in					
EMI Filter				optional					

* For Use With Three-Phase Motors Only.
If 3-phase power source is non-symmetrical, refer to "Circuit Connections – RFI Jumper" in the GS4 AC Drives User Manual, Chapter 2 (www.automationdirect.com).
Please refer to "GS4 DURApulse Accessories – Fusing" (pg.GSX-164) for input fusing information.
** Watt loss is reduced if the GS4 drive is flange mounted (frame sizes A through F; frame G is not capable of flange mounting).

Surge Protection [NFPA 70, Article 670.6]

The electrical enclosure shall have proper surge protection if the upstream supply circuit does not protect the enclosure

- The upstream distribution panel has integral surge protection, so this is compliant

NFPA 70, Article 670 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of UL508A:

Part 2 Enclosures

The enclosure shall have the proper rating for the environment it is installed in. It shall be constructed to support the weight within as well as the environmental forces such as wind & snow. It shall have appropriate markings to indicate manufacturer's intent.

Part 2 Industrial Machinery

Shall comply with NFPA 79 and other standards listed in sections 65 to 67

UL508A Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Construction Requirements of NFPA 79:

System must comply with sections 4 – 17 of NFPA 79. Some of the higher priority requirements are summarized below that are accompanied with onsite pictures of the actual gear. Other specific sections/requirements will be called out as needed, if it's applicable to the equipment being evaluated.

Electrical Supply

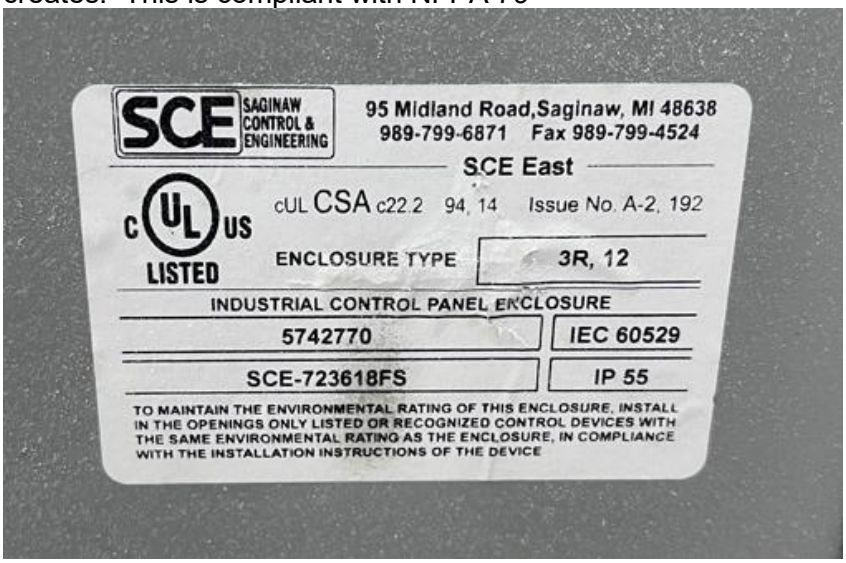
The system shall be able to operate within 90%-110% of voltage rating, 99%-101% frequency rating, and harmonic THD of 0%-10% for short periods of time.

- The equipment is operating around 460V and is within the machine's tolerance. It was observed to be working with the evaluated conditions (feeder size, voltage, breaker, etc). It is compliant with NFPA 79

Environmental

The system shall be protected from the environment it is installed within.

- The control cabinets are NEMA 3R/12, which is the best protection from all of the white dust the mill creates. This is compliant with NFPA 79



Available Fault Current

The system shall have a larger withstand short circuit rating than the maximum available fault current on the line terminals of the system's disconnecting means.

- See NEC 670 section above. The installation is compliant

Disconnecting Means

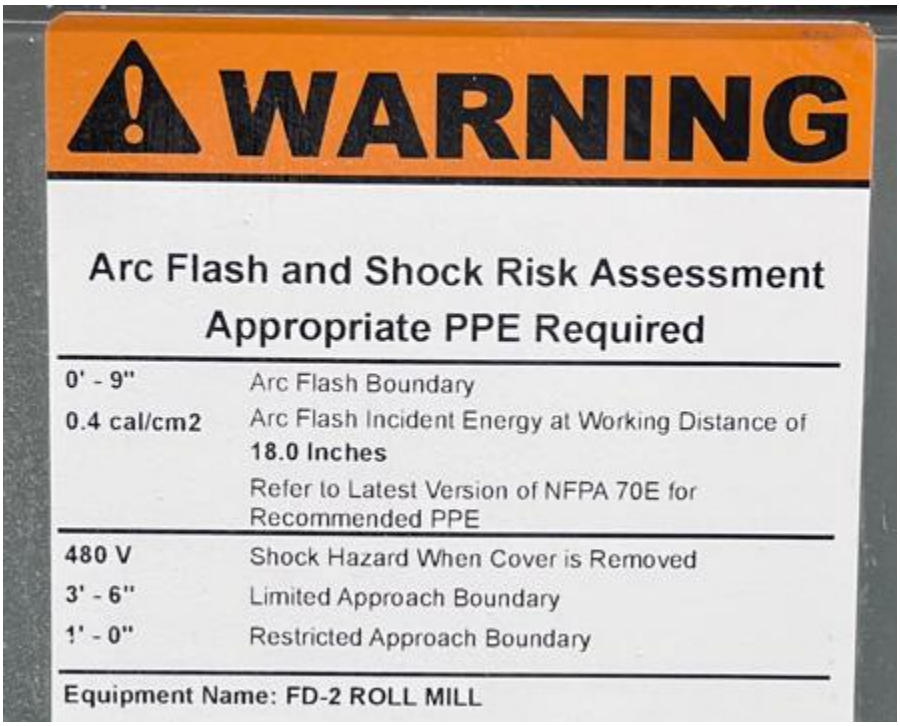
The system shall have a single disconnecting means from the single supply circuit wherever possible. The line side must be protected from unintentional direct contact by users when the enclosure door is opened. A disconnecting means is not required for circuits less than 50VAC RMS or 60VDC.

- See NEC 670 section above. The installation is compliant

Protection from Electrical Hazards

The system shall have live parts insulated from users and openings/windows must meet UL requirements. It must have integral fault protection for accidental connections to live parts. Any interlocked electrical supply circuits must be indicated on the enclosure with a warning placard. An arc flash hazard warning placard must be placed on the enclosures with live electrical present.

- The installation is compliant with NFPA 79. The fuse clips have phase dividers, but someone could still come in contact with live parts, if the disconnect switch's interlock is bypassed. The socomec disconnect must be in the "off" position for the door to be opened, but someone could easily turn the shaft to the "on" position once the door is opened. The door has the proper warning signs that lets people know there's an arc flash hazard though, if the door is opened. A recent arc flash study was also completed that lets an operator know the incident energy present at the line terminals



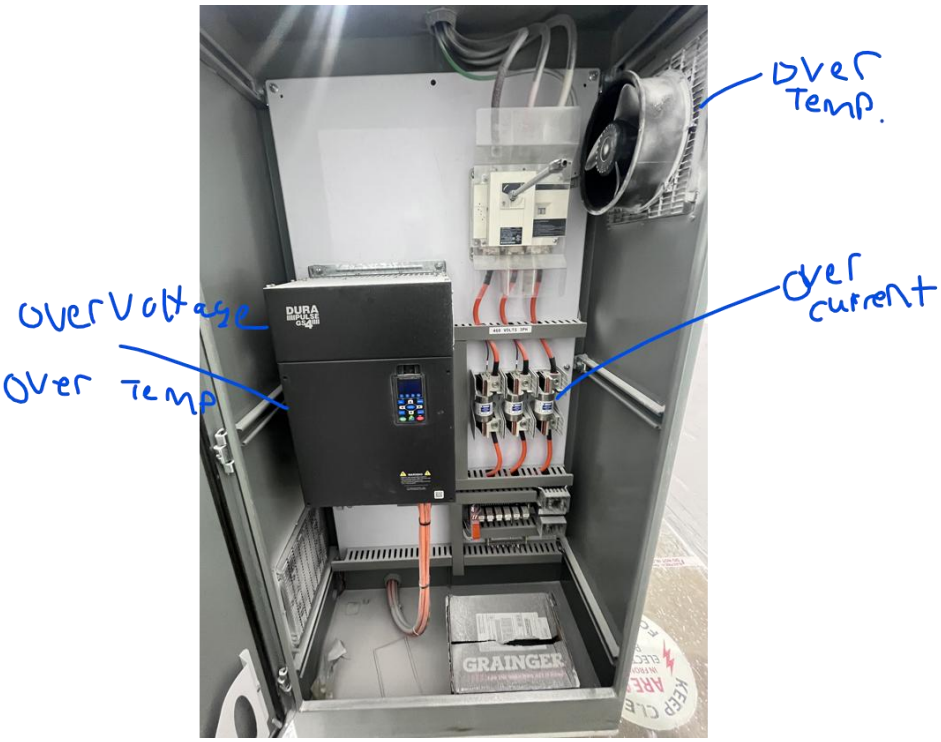
Protection of Equipment

The system may have some of the following protection in order to protect the equipment

- Overcurrent
- Overloads for motors
- Ground fault
- Overvoltage
- Abnormal temperature
- Incorrect phases or loss of phases
- Overspeed of machines

- The machine is protected by overcurrent, overload for the motor (within the VFD), overvoltage by upstream surge protection & integral to VFD, and overtemperature by enclosure fans & integral to the VFD. The VFD also protects against ground leakage, stall prevention, etc.

Protection Characteristics	***Motor Protection***	Electronic thermal relay protection
	Over-current Protection	For drive model 230V and 460V: Over-current protection for 240% rated current Current clamp: VT duty 170–175%; CT duty 180–185%
	Over-voltage Protection	230V: drive will stop when DC-BUS voltage exceeds 410V 460V: drive will stop when DC-BUS voltage exceeds 820V
	Over-temperature Protection	Built-in temperature sensor
	Stall Prevention	Independent stall prevention during acceleration, deceleration, and running
	Restart After Instantaneous Power Failure	Up to 20 seconds (parameter settable)
	Ground Leakage Current Protection	Leakage current is higher than 50% of rated current of the AC motor drive
	Hi-Pot Test	UL508C; EN 61800-5-1
	Conformal Coating	IEC-60721-3-3



Grounding & Bonding

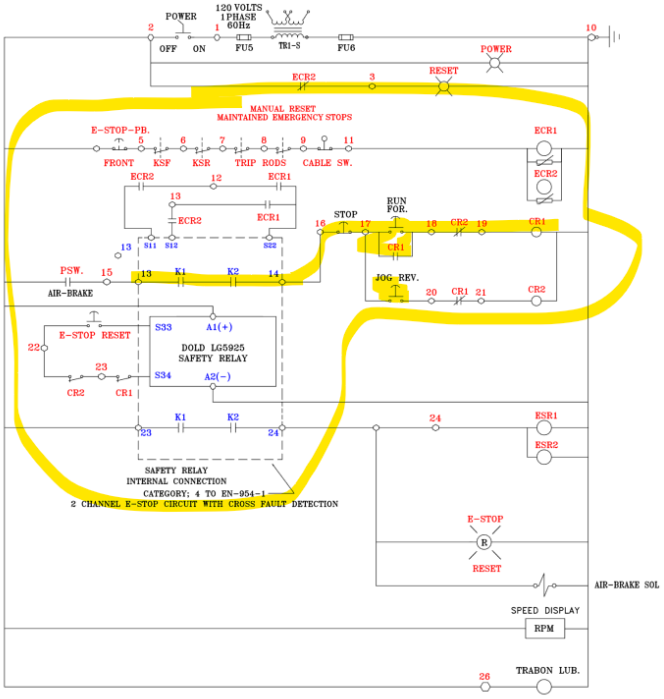
The system shall be installed in accordance with NFPA 70, Article 250 for grounding & bonding. The equipment grounding conductor must be identified with the word “GROUND” or be identified with the GND symbol.

- Corrective actions were made & the symbols were added for the equipment grounds.
- The doors were bonded after the evaluation was done

Control Circuits & Control Functions

The AC control circuit must come from a control transformer must not exceed 120VAC & maximum 1kA available fault current. Any DC control circuit must be less than 250 VDC. All control circuits must have overcurrent protection. All safety/start/stop functions must work as intended. Interlocks shall be in place to ensure machine fails safely. Emergency stops shall keep the machinery de-energized until safety conditions are reset (shouldn’t restart, but act as a permissive to the machinery).

- The control circuits are derived from a 120VAC control XFMR 250VA
- The emergency stops & safety relays use this 120VAC control power to operate. The DOLD safety relay interlocks the Run & Jog commands to the VFD, so an operator can only do that, if the E-stop push-buttons, safety cords, air brake, and trip rods are not active. The safeties were verified to be in working order



Operator Interface and Control Devices

The operator interface must be readily accessible to the machine. Control devices must be mounted securely / installed in compliance with the manufacturer and they must be protected from accidental operation / false signal to the machine. Color indicators shall be the following colors for each function:

- **Start or Normal Conditions** (Green but Black, White, or Gray)
- **Stop** (Red but Black, White, or Gray is permitted for non-emergencies)
- **Emergency Stop or Emergency Conditions** (Red)
  - Must be RED with Mushroom-head Type & yellow background for pushbutton-operated switches. Pull-cord operated switches are also valid.

- **Abnormal Conditions** (Yellow or Amber)
- **Push-Button that Causes Movement** (Black, but White, Gray, Blue is permitted)
- **Push-Button for Resets** (Blue, but Black, White, Gray, and RED if stop/emergency reset)
- **Mandatory Conditions** (Blue)
- **Neutral Conditions** (White)

- The installation is compliant with NFPA 79 control devices & colors. The reset is blue, stop is red, emergency stop is red, run is green, movement is black

Control Equipment: Location, Mounting, and Enclosures

All enclosures must be mounted so it allows maintenance, protection against environmental influences, and allows normal operation of the machinery. Exposed, live electrical terminations must be protected. Mechanical tubing, piping, valves, etc to handle gas, liquid, or air must not be located within the enclosure. Electrical working spaces defined in NFPA 70, Article 110 shall be followed for the enclosure and its doors.

- The installation is compliant with NFPA 79 and NFPA 70 working clearances

Conductors, Cables, and Flexible Cords

All cabling/conductors shall be identified and installed in accordance with their intended use. Conductors must be copper with appropriate insulation and ampacity rating not less than 125% of the full load current

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

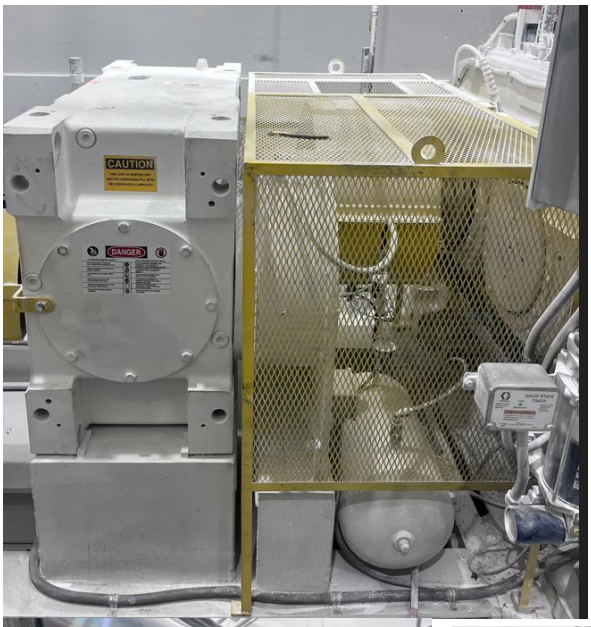
The ampacity rating must take into account deration factors such as more than three current-carrying conductors in raceway, temperature, buried, etc. The wire's insulation shall be rated for all voltage levels present within the raceway.

- The cabling & raceways within the control cabinets are compliant with NFPA 79 and NFPA 70

Wiring Practices

All connections must be installed so it prevents accidental loosening. Terminals must be rated for the wire and labeled clearly. In no instance shall the wire cross over the terminals for panel/field wiring. Wires shall be run from source to destination without splices or joints within the enclosure. If an enclosure is supplied from more than one power source, the power wiring must be run in separate raceways for each disconnecting means. Exposed cables are permitted along machinery supports, but care should be taken to ensure the cabling doesn't inhibit maintenance (machine guards, grease ports, gauges, etc). Cabling must be supported adequately so sagging or damage doesn't occur. Cables subjected to damage must be protected and installed in compliance with NFPA 70. Grounding conductors must be identified by color green with or without yellow stripes.

- The cabling & raceways are secured in compliance with NFPA 79 and NFPA 70. Only one power source was brought to the mill. There is a local disconnecting means for the machine on the control cabinet & there's a fused disconnect for the electrical feeder within 15' of the machine. It was observed that large conductors are permanently installed & there are metal cages protecting critical items. There were not loose cables, raceways, or hoses. Grounding conductors were all green insulation.



Electric Motors and Associated Equipment

All motors shall be mounted so they are adequately protected from damage, accessible for maintenance, have proper cooling, and can be easily replaced. Motors shall be selected to match the connected process conditions. Motors must have nameplate data marked in compliance with NFPA 70, Article 430, and they must have appropriate motor controllers and protection.

- Motors have appropriate nameplates and are compliant with NFPA 79

Receptacles and Lighting

Receptacles for machinery must be GFCI-protected, supplied from grounded 120V source, have proper overcurrent protection, and be rated to withstand the environment it is installed in. Only lighting systems designed for use greater than 150V may be permitted; otherwise, lighting systems should be 120V for machinery. Lighting must have overcurrent protection, must not exceed 15 Amps, and must be rated for the physical environment.

- There are not any receptacles or lighting on the machine that are fed from the single electrical supply, so this machine is compliant with NFPA 79

Marking and Safety Signs

The equipment must be marked with supplier's name, trademark, and identifying symbol. Safety placards and markings must be permanent.

- Warning Label – *Potential Electric Shock and Arc Flash Hazard*
  - Place visibly on Enclosure when Voltage is greater than 50VAC or 60VDC

- Nameplate
  - Required by manufacturer
    - Name of Supplier
    - Model, Serial Number, etc
    - Rated voltage, phase, frequency, and full-load current for each supply
    - Largest Motor or Load
    - Max Protective Device Threshold
    - Short Circuit Current Rating
    - Electrical Diagram Number(s) or Drawing Index

- The electrical equipment and control panels have necessary warning placards on them. The control panel is missing a nameplate placard, so one shall be printed / placed on the panel.

Technical Documentation

The machinery must have necessary information present for installation, operation, maintenance, and storage of the machine. This can be in the form of drawings, diagrams, charts, tables, etc. It must be stored onsite with the machine.

- The drawings were printed off and stored with the machine after the evaluation was done

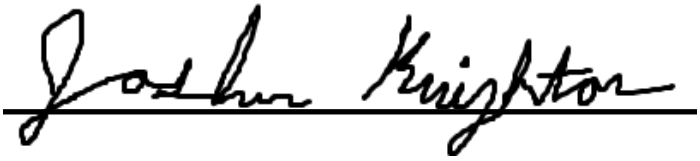
NFPA 79 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

I hereby certify that I am a professional engineer, registered in the State of South Dakota and I do not benefit financially by the sale/manufacturing of the equipment evaluated within this report, I did not impose excessive financial preconditions to evaluate the equipment, and there were not any conflicts of interests in performing the evaluation. I attest that the evaluation and report was performed by me personally and is to the best of my knowledge complete and accurate.



November 24, 2025

Date:

Joshua J. Knighton
Professional Engineer

Observation Log:

During the evaluation, differences between the observed installation and the governing standards are logged here with recommended actions to correct the issue (if required).

The issues discovered shall be corrected before the final report is sent to the Electrical Commission and the FEB label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

Observation Log			
Non-Compliance Issue No.	**Standard/Code Reference**	**Issue**	**Corrective Action Required**
1	NFPA 79	Missing drawings + technical information	Yes - print off the drawings & place in the machine's control cabinet **Completed 2025-11-24**
2	NEC 670	Nameplate information isn't posted on the panel	Yes – a label should be placed on the control cabinet door that shows the calculated information shown in this report. **Completed 2025-11-24**
3	NFPA 79	Ground symbol sticker is missing	Yes – ground symbol stickers are missing & should be placed at all bond points. **Completed 2025-11-24**
4	NFPA 79	Ground bond for main control cabinet door is missing	Yes – bonding strap should be placed on all enclosure doors **Completed 2025-11-24**

SOUTH DAKOTA DEPARTMENT OF LABOR AND REGULATION

SOUTH DAKOTA ELECTRICAL COMMISSION

217 West Missouri Avenue, Pierre, SD 57501
Tel: 605.773.3573 Toll-Free: 1.800.233.7765 Fax: 605.773.6213 dlr.sd.gov/electrical

MACHINERY DESIGNATION APPLICATION

Entity Name: Showplace Cabinetry Contact Person: Jerzy Nielsen

Tel: (877) 607 – 2200

Address: 1 Enterprise St #2 (STREET) Harrisburg (CITY) SD (STATE) 57032 (ZIP)

Installation Address: : 1 Enterprise St #2 (STREET) Sioux Falls (CITY) 57032 (ZIP)

☑ Yes ☐ No: Entity presents application as official notice that Entity is designating the following equipment at the installation address as machinery.

Description of Machinery:
The Fletcher Machine is used for a unique manufacturing process at entity's location above.
3rd Party Evaluation for UL508a, NFPA 79, and NEC 670 Compliance by Muth Power Solutions (Joshua Jay Knighton). Field Evaluation Label (FEB) with unique identifier placed on the machinery.
Specific labels for this machine include - (MPS-FEB-060016)

Name of Professional Engineer involved: Joshua Knighton License No.: 16721

Please answer the following questions:

☐ Yes ☑ No: The machinery as a packaged unit is available in a listed form.

☐ Yes ☑ No: Has an electrical standard been prepared or adopted to which the machinery should conform. (e.g. NRTL or NFPA 79: Electrical Standard for Industrial Machinery)

☑ Yes ☐ No: The machinery is specific electrical equipment for use by the applying entity and not a line as manufactured, stored, sold, installed, or attached.

☑ Yes ☐ No: A label indicating the installation complies with nationally recognized standards or tests determining suitable usage for said installation in manner utilized has been adhered to machinery by 3rd party conducting field listing.

☑ Yes ☐ No: In the opinion of the Entity the machinery complies with NEC 670.

☑ Yes ☐ No: Entity accepts responsibility and liability for the machinery.

☑ Yes ☐ No: Entity is of the opinion the machinery is safe for the use intended.

By my signature below, I do solemnly swear the statements made herein are true and correct to the best of my knowledge and belief. Completion of this application does not guarantee approval.

Name: Rick Schaff Position: Manager

SIGNATURE

01/05/2026
DATE

To Submit: Mail or fax to the South Dakota Electrical Commission (contact information at the top of this form).

Ensure your application includes:

☑ Signature and Date
☑ Attach Stamped Engineering plans

12/30/2025

Field Evaluation of Non-Listed Industrial Machinery

MPS-FEB-060016

Fletcher Machine – 23550-1

Showplace Cabinetry

1505 W Main St, Beresford, 57004
Union County, South Dakota

Revision	Description	Date
0.0	Initial Release **(FAILED)**	2025-08-05
1.0	Corrections Made **(PASSED)**	2025-12-30

Muth Power Solutions

Summary:

FLETCHER MACHINE, 23550-1 panel(s) + connected equipment was installed without a recognized listing label. The panel + connected equipment was built solely for **Showplace Cabinetry** and will only be used in their production processes. South Dakota's Electrical Commission requires an application to be submitted when there is ***"No Listing on Installation"***. The requirements for the machinery designation & to be approved by the commission and authority having jurisdiction (AHJ) is as follows:

- No Standard has been prepared or adopted
- Owner states machinery is safe for intended us
- The machinery is specific electrical equipment for use by applying entity and not a line as manufactured, stored, sold, installed, or attached
- Comply with Article 670 of NFPA 70
  - Nameplate Information
  - **Provide proof of compliance with NFPA 79 by licensed professional engineer**

The intent of this report is to show the findings of the evaluation by a professional engineer. If anything was discovered to be non-compliant, it'll be listed in the ***Observations Log*** at the end of the report. Any issues discovered that require corrective actions must be corrected before a final report will be sent to the South Dakota Electrical Commission and the Field Evaluation Body (FEB) label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

In compliance with NFPA 791, Muth Power Solutions (M.P.S) generated a unique serial number for the FEB label: **MPS-FEB-060016**. This serial number will be referenced on the machine label as well as in this evaluation report once the machinery is compliant with applicable standards.

Any performance testing is outside the scope and was not performed during this evaluation.

The following versions of codes / standards were used for this evaluation

- NFPA 70 National Electrical Code (2020)
- NFPA 79 Electrical Standard for Industrial Machinery (2024)
- NFPA 790 Competency of Third-Party Field Evaluation Bodies (2024)
- NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment (2024)

Overall Result of Evaluation:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of NFPA 70, Article 670:

Definition of Industrial Machinery [NFPA 70, Article 670.2]

A power-driven machine (or a group of machines working together in a coordinated manner), not portable by hand while working, that is used to process material by cutting; forming; pressure; electrical, thermal, or optical techniques; lamination; or a combination of these processes. It can include associated equipment used to transfer material or tooling, including fixtures, to assemble/disassemble, to inspect or test, or to package [The associated electrical equipment, including the logic controller(s) and associated software/logic together with the machine actuators and sensors, are considered as part of the industrial machine]

- **Per the definition above, the FM-550 should be classified as industrial machinery**
  - The machine is used to process wood by cutting techniques. It also includes equipment to transfer the wood from process to process

Nameplate Data [NFPA 70, Article 670.3(A)]

The nameplate must be attached to the control equipment enclosure or machine with the following information.

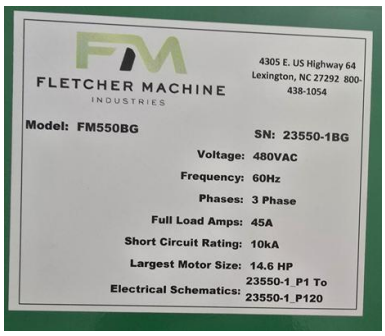
There are multiple machines that are linked to this FM-550 machine that have individual circuits to them

FM-210 MAIN + SUB PANELs

- Supply Voltage: **480V**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **60 FLA**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **14.6 HP**
- Electrical Drawing Number: **23550-1_P1 – P120**

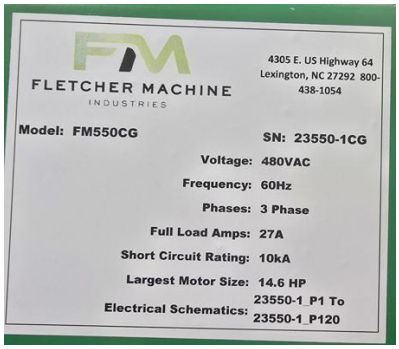
FM-550BG MAIN PANEL

- Supply Voltage: **480V**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **45 FLA**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **14.6 HP**
- Electrical Drawing Number: **23550-1_P1 – P120**



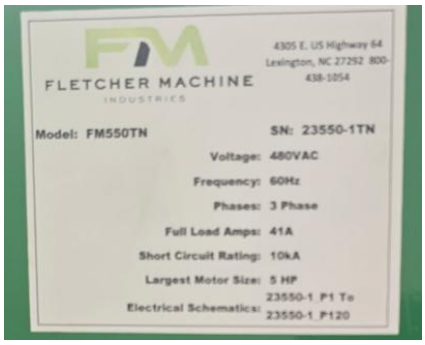
FM-550CG CENTER GROOVER PANEL

- Supply Voltage: **480V**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **27 FLA**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **14.6 HP**
- Electrical Drawing Number: **23550-1_P1 – P120**



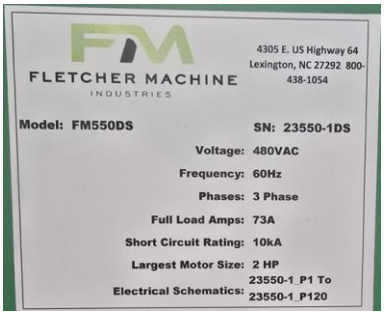
FM550TH TOE KICK STATION PANEL

- Supply Voltage: **480V**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **41 FLA**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **5 HP**
- Electrical Drawing Number: **23550-1_P1 – P120**



FM550DS DRILL POWER STATION PANEL

- Supply Voltage: **480V**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **73 FLA**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **2 HP**
- Electrical Drawing Number: **23550-1_P1 – P120**



Supply Conductors [NFPA 70, Article 670.4(A)]

The supply conductors must have an ampacity rating not less than

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

- Panel **FM-210 MAIN + SUB PANELs**
  - The panel is fed from #3 CU conductors, which are rated for 100A @ 75 Deg C
  - Using the equation above, the demand is approximately 85A
  - The supply conductors are **OKAY** per demand calculation below

Heating Loads						
Load	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]

Supply Conductor Rating @ 75 Deg C
#3 - 100A Rating

Calculated Amps (1.25 (heat + large motor) + Other Loads)
85.88

Largest Motor							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Front Left Panel Power Feed	10	23.1	460	3	0.88	0.855	24.46

Other Loads							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Feed Chain Drives	4	5.5	460	3	0.88	0.855	5.82
Front Right Panel Power Feed	-	23.1	460	3	0.71	0.95	27.29
Outfeed Drive	2	2.42	460	3	0.9	0.835	2.57
Control XFMR	-	4.347826	460	1	0.95	0.97	2.17

- Panel “44” or **FM-550BG MAIN PANEL**
  - The panel is fed from #4 CU conductors, which are rated for 85A @ 75 Deg C
  - Using the equation above, the demand is approximately 64A
  - The supply conductors are **OKAY** per demand calculation below

Heating Loads						
Load	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]

Supply Conductor Rating @ 75 Deg C
#4 - 85A Rating

Calculated Amps (1.25 (heat + large motor) + Other Loads)
63.36

Largest Motor							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Groover #1 Drive	15	19.1	460	3	0.83	0.9	20.37

Other Loads							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Groover #2 Drive	15	19.1	460	3	0.83	0.9	20.37
Transport Drive	3	3	460	3	0.88	0.9	3.02
Control XFMR	-	3.26087	460	1	0.95	0.97	1.63

- Panel **FM-550CG CENTER GROOVER**
  - The panel is fed from #4 CU conductors, which are rated for 85A @ 75 Deg C
  - Using the equation above, the demand is approximately 40A
  - The supply conductors are **OKAY** per demand calculation below

Heating Loads						
Load	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]

Supply Conductor Rating @ 75 Deg C
#4 - 85A Rating

Calculated Amps (1.25 (heat + large motor) + Other Loads)
39.85

Largest Motor							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Center Groover Drive	15	19.1	460	3	0.9	0.9	18.79

Other Loads							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Rear Right 210 Panel	-	8.4	460	3	0.9	0.9	8.26

- Panel **FM-550TH TOE KICK STATION**
  - The panel is fed from #4 CU conductors, which are rated for 85A @ 75 Deg C
  - Using the equation above, the demand is approximately 57A
  - The supply conductors are **OKAY** per demand calculation below

Heating Loads						
Load	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]

Supply Conductor Rating @ 75 Deg C
#4 - 85A Rating

Calculated Amps (1.25 (heat + large motor) + Other Loads)
57.66

Largest Motor							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Left Toe Kick Vert. Drive	4	7.3	460	3	0.9	0.9	7.18

Other Loads							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Infeed Drive	2	3.4	460	3	0.9	0.9	3.34
Transport Wheels Drive	2	3.4	460	3	0.9	0.9	3.34
Left Toe Kick Horz. Drive	4	7.3	460	3	0.9	0.9	7.18
Right Toe Kick Vert. Drive	4	7.3	460	3	0.9	0.9	7.18
Right Toe Kick Horz. Drive	4	7.3	460	3	0.9	0.9	7.18
Infeed Rolls Horz. Servo Drive	-	3.5	460	3	0.9	0.9	3.44
Right Toe Kick Pos. Servo Drive	-	3.5	460	3	0.9	0.9	3.44
Control XFMR	-	3.26087	460	1	0.9	0.9	1.85

- Panel **FM-550DS Drill Station**
  - The panel is fed from #3 CU conductors, which are rated for 100A @ 75 Deg C
  - Using the equation above, the demand is approximately 66A
  - The supply conductors are **OKAY** per demand calculation below

Heating Loads						
Load	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]

Supply Conductor Rating @ 75 Deg C
#3 - 100A Rating

Calculated Amps (1.25 (heat + large motor) + Other Loads)
65.82

Largest Motor							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Front Drill Row Drive	5	9.2	460	3	0.9	0.9	9.05

Other Loads							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Infeed Conveyor	2	3.4	460	3	0.9	0.9	3.34
Center Drill Row Drive	5	9.2	460	3	0.9	0.9	9.05
Front Drill Row Drive	5	9.2	460	3	0.9	0.9	9.05
Back Infeed Vert. Servo Drive	1.5	3.5	460	3	0.9	0.9	3.44
Back Outfeed Vert. Servo Drive	1.5	3.5	460	3	0.9	0.9	3.44
Front Infeed Vert. Servo Drive	1.5	3.5	460	3	0.9	0.9	3.44
Front Outfeed Vert. Servo Drive	1.5	3.5	460	3	0.9	0.9	3.44
Servo Panel Power Feed	1.5	3.5	460	3	0.9	0.9	3.44
Control XFMR	-	4.347826	460	1	0.9	0.9	2.47

Disconnecting Means [NFPA 70, Article 670.4(B)]

The electrical enclosure must have a disconnecting means since the machine is considered an individual unit. It is not required to have integral overcurrent protection. Each set of supply circuit conductors on the line side of the machine supply circuit must have disconnecting means.

- Panel **FM-210 MAIN + SUB PANELs**
  - The panel has single disconnecting means to the main, which then feeds the (2) sub-panels. It is clear this disconnects FM-210 & its associated equipment

- Panel “44” or **FM-550BG MAIN PANEL**
  - The panel has single disconnecting means. It is clear this disconnects the panel & its associated equipment

- Panel **FM-550CG CENTER GROOVER**
  - The panel has a disconnect for the 460V, but it doesn’t have a single disconnect for the 120V control power. This panel receives a circuit from FM-210.
    - Corrective Action was to place a NEC compliant label on the panel that indicates multiple power sources are present. There should be another label that instructs the operator where each source disconnecting means is located (460V + 120V). The 120V must be rated for a disconnecting means & compatible with lockout/tag out procedures

- Panel **FM-550TH Toe Kick**
  - The panel has single disconnecting means. It is clear this disconnects the panel & its associated equipment

- Panel **FM-550DS Drill Unit**
  The panel has single disconnecting means. It is clear this disconnects the panel & its associated equipment

Overcurrent Protection [NFPA 70, Article 670.4(C)]

Each electrical enclosure must have a single feeder circuit breaker or fuses when furnished as part of an industrial machine. The rating of the overcurrent device shall be sized on sum of

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

- Panel **FM-210 MAIN + SUB PANELs**
  - Per the supply conductor calculation above, the panel has approximately 85A. The overcurrent protection is the fused disconnect with **100A fuses**
  - The overcurrent protection is **OKAY** per demand calculation above

- Panel "44" or **FM-550BG MAIN PANEL**
  - Per the supply conductor calculation above, the panel has approximately 60A. The overcurrent protection is the fused disconnect with **60A fuses**
  - The overcurrent protection is **OKAY** per demand calculation above

- Panel **FM-550CG CENTER GROOVER**
  - Per the supply conductor calculation above, the panel has approximately 40A. The overcurrent protection is the fused disconnect with **60A fuses**
    The overcurrent protection is **OKAY** per demand calculation above

- Panel **FM-550TH Toe Kick**
  - Per the supply conductor calculation above, the panel has approximately 57A. The overcurrent protection is the fused disconnect with **60A fuses**
    The overcurrent protection is **OKAY** per demand calculation above

- Panel **FM-550DS Drill Unit**

- Per the supply conductor calculation above, the panel has approximately xxA. The overcurrent protection is the fused disconnect with **100A fuses**
  The overcurrent protection is **OKAY** per demand calculation above

Short Circuit Current Rating [NFPA 70, Article 670.5]

The electrical enclosure must not be installed in a location where the maximum available fault current exceeds the nameplate rating.

- Panel **FM-210 MAIN + SUB PANELs**
  - The facility is fed from a 1000 kVA XFMR with 5.23%Z
  - Per the fault current calculation below for infinite primary impedance, the panel has a maximum fault current of approximately **6,778 Amps**, which is **OKAY** since it's less than the panel's SCCR of 10 kAIC

FAULT CURRENT CALCULATION

Utility XFMR Rating:	1000 kVA	Transformer Phase:	3	Impedance (%Z):	5.23%	Fault Current (Inf. Bus):	22998.34 A	Utility XFMR Secondary Voltage	480									

Panel or Transformer Name	Feeder Length in Feet "L"	Upstream Available Fault Current "I"	Wire Material	Wire Size	Conduit Type	(Based on Wire and Conduit) "C"	Line-to-Line Voltage "E"	Number of Conductors "n"	f = √3 x L x I n x C x E	Total Available Fault Current Itot=Isc+Isy m(mot.cont.)	Transformer KVA	Transformer %Z	Transformer Phase	Transformer Primary Voltage	Transformer Secondary Voltage	f = Isc x Vprim x √3 x (%Z) 100,000 x KVAtrans	M = 1 1 + f	Transformer Secondary Available Fault Current Isc(secondary)= (Vprim/Vsecondary) x M x Isc(primary)
CT Cab	10	22,998	COPPER	400 MCM	STEEL	19703	480	6	0.01	22838								
Main Switch (1 of 2)	30	22,838	COPPER	400 MCM	NON-MAGNETIC	24296	480	6	0.02	22457								
Panel "HN"	280	22,457	COPPER	3/0 AWG	STEEL	12843	480	2	0.88	11924								
210 Disconnect	80	11,924	COPPER	3 AWG	STEEL	4760	480	1	0.72	6920								
210 CP	4	6,920	COPPER	3 AWG	STEEL	4760	480	1	0.02	6778								

- Panel **FM-550BG MAIN**
  - The facility is fed from a 1000 kVA XFMR with 5.23%Z
  - Per the fault current calculation below for infinite primary impedance, the panel has a maximum fault current of approximately **6,829 Amps**, which is **OKAY** since it's less than the panel's SCCR of 10 kAIC

FAULT CURRENT CALCULATION

Utility XFMR Rating:	1000 kVA	Transformer Phase:	3	Impedance (%Z):	5.23%	Fault Current (Inf. Bus):	22998.34 A	Utility XFMR Secondary Voltage	480									

Panel or Transformer Name	Feeder Length in Feet "L"	Upstream Available Fault Current "I"	Wire Material	Wire Size	Conduit Type	(Based on Wire and Conduit) "C"	Line-to-Line Voltage "E"	Number of Conductors "n"	f = √3 x L x I n x C x E	Total Available Fault Current Itot=Isc+Isy m(mot.cont.)	Transformer KVA	Transformer %Z	Transformer Phase	Transformer Primary Voltage	Transformer Secondary Voltage	f = Isc x Vprim x √3 x (%Z) 100,000 x KVAtrans	M = 1 1 + f	Transformer Secondary Available Fault Current Isc(secondary)= (Vprim/Vsecondary) x M x Isc(primary)
CT Cab	10	22,998	COPPER	400 MCM	STEEL	19703	480	6	0.01	22838								
Main Switch (1 of 2)	30	22,838	COPPER	400 MCM	NON-MAGNETIC	24296	480	6	0.02	22457								
Panel "HN"	280	22,457	COPPER	3/0 AWG	STEEL	12843	480	2	0.88	11924								
"44" Disconnect	60	11,924	COPPER	4 AWG	STEEL	3806	480	1	0.68	7105								
FM-550BG CP	6	7,105	COPPER	4 AWG	STEEL	3806	480	1	0.04	6829								

- Panel **FM-550CG CENTER GROOVER**

- The facility is fed from a 1000 kVA XFMR with 5.23%Z
- Per the fault current calculation below for infinite primary impedance, the panel has a maximum fault current of approximately **5,718 Amps**, which is **OKAY** since it's less than the panel's SCCR of 10 kAIC

FAULT CURRENT CALCULATION

Utility XFMR Rating:	1000 kVA	Transformer Phase:	3	Impedance (%Z):	5.23%	Fault Current (Inf. Bus):	22998.34 A	Utility XFMR Secondary Voltage	480

Panel or Transformer Name	Feeder Length in Feet "L"	Upstream Available Fault Current "I"	Wire Material	Wire Size	Conduit Type	(Based on Wire and Conduit) "C"	Line-to-Line Voltage "E"	Number of Conductors "n"	f = √3 x L x I / n x C x E	Total Available Fault Current Itot=Isc+Isy m(mot.cont.)	Transformer KVA	Transformer %Z	Transformer Phase	Transformer Primary Voltage	Transformer Secondary Voltage	f = Isc x Vprim x √3 x (%Z) / 100,000 x KVAtrans	M = 1 / 1 + f	Transformer Secondary Available Fault Current Isc(secondary)= (Vprim/Vsecondary) x M x Isc(primary)
CT Cab	10	22,998	COPPER	400 MCM	STEEL	19703	480	6	0.01	**22838**								
Main Switch (1 of 2)	30	22,838	COPPER	400 MCM	NON-MAGNETIC	24296	480	6	0.02	**22457**								
Panel "HN"	280	22,457	COPPER	3/0 AWG	STEEL	12843	480	2	0.88	**11924**								
CENTER GROOVER Disconnect	90	11,924	COPPER	4 AWG	STEEL	3806	480	1	1.02	**5910**								
FM-550CG CP	6	5,910	COPPER	4 AWG	STEEL	3806	480	1	0.03	**5718**								

- Panel **FM-550TH Toe Notch**
  - The facility is fed from a 1000 kVA XFMR with 5.23%Z
  - Per the fault current calculation below for infinite primary impedance, the panel has a maximum fault current of approximately **7,153 Amps**, which is **OKAY** since it's less than the panel's SCCR of 10 kAIC

FAULT CURRENT CALCULATION

Utility XFMR Rating:	1000 kVA	Transformer Phase:	3	Impedance (%Z):	5.23%	Fault Current (Inf. Bus):	22998.34 A	Utility XFMR Secondary Voltage	480

Panel or Transformer Name	Feeder Length in Feet "L"	Upstream Available Fault Current "I"	Wire Material	Wire Size	Conduit Type	(Based on Wire and Conduit) "C"	Line-to-Line Voltage "E"	Number of Conductors "n"	f = √3 x L x I / n x C x E	Total Available Fault Current Itot=Isc+Isy m(mot.cont.)	Transformer KVA	Transformer %Z	Transformer Phase	Transformer Primary Voltage	Transformer Secondary Voltage	f = Isc x Vprim x √3 x (%Z) / 100,000 x KVAtrans	M = 1 / 1 + f	Transformer Secondary Available Fault Current Isc(secondary)= (Vprim/Vsecondary) x M x Isc(primary)
CT Cab	10	22,998	COPPER	400 MCM	STEEL	19703	480	6	0.01	**22838**								
Main Switch (1 of 2)	30	22,838	COPPER	400 MCM	NON-MAGNETIC	24296	480	6	0.02	**22457**								
Panel "HN"	280	22,457	COPPER	3/0 AWG	STEEL	12843	480	2	0.88	**11924**								
Toe Notch Disconnect	55	11,924	COPPER	4 AWG	STEEL	3806	480	1	0.62	**7352**								
FM-550TH CP	4	7,352	COPPER	4 AWG	STEEL	3806	480	1	0.03	**7153**								

- Panel **FM-550DS Drill Unit**
  - The facility is fed from a 1000 kVA XFMR with 5.23%Z
  - Per the fault current calculation below for infinite primary impedance, the panel has a maximum fault current of approximately **7,344 Amps**, which is **OKAY** since it's less than the panel's SCCR of 10 kAIC

FAULT CURRENT CALCULATION

Utility XFMR Rating:	1000 kVA	Transformer Phase:	3	Impedance (%Z):	5.23%	Fault Current (Inf. Bus):	22998.34 A	Utility XFMR Secondary Voltage	480

Panel or Transformer Name	Feeder Length in Feet "L"	Upstream Available Fault Current "I"	Wire Material	Wire Size	Conduit Type	(Based on Wire and Conduit) "C"	Line-to-Line Voltage "E"	Number of Conductors "n"	f = √3 x L x I / n x C x E	Total Available Fault Current Itot=Isc+Isy m(mot.cont.)	Transformer KVA	Transformer %Z	Transformer Phase	Transformer Primary Voltage	Transformer Secondary Voltage	f = Isc x Vprim x √3 x (%Z) / 100,000 x KVAtrans	M = 1 / 1 + f	Transformer Secondary Available Fault Current Isc(secondary)= (Vprim/Vsecondary) x M x Isc(primary)
CT Cab	10	22,998	COPPER	400 MCM	STEEL	19703	480	6	0.01	**22838**								
Main Switch (1 of 2)	30	22,838	COPPER	400 MCM	NON-MAGNETIC	24296	480	6	0.02	**22457**								
Panel "HN"	280	22,457	COPPER	3/0 AWG	STEEL	12843	480	2	0.88	**11924**								
Drill Unit Disconnect	65	11,924	COPPER	3 AWG	STEEL	4760	480	1	0.59	**7511**								
FM-550DS CP	4	7,511	COPPER	3 AWG	STEEL	4760	480	1	0.02	**7344**								

Surge Protection [NFPA 70, Article 670.6]

The electrical enclosure shall have proper surge protection if the upstream supply circuit does not protect the enclosure

- Each panel has appropriate surge protection for the control/safety circuits as shown below for the machine
  - FM-210

- FM-550BG

- FM-550CG
  - This panel's 120V control circuit is fed from FM-210, so it has compliant SPD
- FM-550TH

- FM-550DS

NFPA 70, Article 670 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of UL508A:

Part 2 Enclosures

The enclosure shall have the proper rating for the environment it is installed in. It shall be constructed to support the weight within as well as the environmental forces such as wind & snow. It shall have appropriate markings to indicate manufacturer's intent.

Part 2 Industrial Machinery

Shall comply with NFPA 79 and other standards listed in sections 65 to 67

UL508A Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Construction Requirements of NFPA 79:

System must comply with sections 4 – 17 of NFPA 79. Some of the higher priority requirements are summarized below that are accompanied with onsite pictures of the actual gear. Other specific sections/requirements will be called out as needed, if it's applicable to the equipment being evaluated.

Electrical Supply

The system shall be able to operate within 90%-110% of voltage rating, 99%-101% frequency rating, and harmonic THD of 0%-10% for short periods of time.

- The parameters were measured & they are **OKAY** / within the tolerances listed above for each supply service to the industrial machine

Environmental

The system shall be protected from the environment it is installed within

- The industrial machine is installed in a dry & dusty area that's routinely exposed to sawdust & wood shavings. Each electronic enclosure should be protected with at least a NEMA 12 enclosure. All the observed enclosures are **OKAY** and had appropriate ratings of NEMA 12
  - FM-210

  - FM-550BG

  - FM-550CG

  - FM-550TH

  - FM-550DS

Available Fault Current

The system shall have a larger withstand short circuit rating than the maximum available fault current on the line terminals of the system's disconnecting means

- The industrial machine is fed from (5) separate supply circuits. Each circuit was evaluated back to the XFMR source and the maximum fault current was calculated down to each machine disconnect. All the observed enclosures are **OKAY** and had appropriate SCCR ratings as noted in NFPA 670 section above

Disconnecting Means

The system shall have a single disconnecting means from the single supply circuit wherever possible. The line side must be protected from unintentional direct contact by users when the enclosure door is opened. A disconnecting means is not required for circuits less than 50VAC RMS or 60VDC.

- The industrial machine is fed from (5) separate supply circuits. Refer to NFPA 670 section above for more information

Protection from Electrical Hazards

The system shall have live parts insulated from users and openings/windows must meet UL requirements. It must have integral fault protection for accidental connections to live parts. Any interlocked electrical supply circuits must be indicated on the enclosure with a warning placard. An arc flash hazard warning placard must be placed on the enclosures with live electrical present.

- Each cabinet has proper protection & is insulated / covers installed. Arc flash hazard & shock hazard warning placards were installed where necessary
  - FM-210

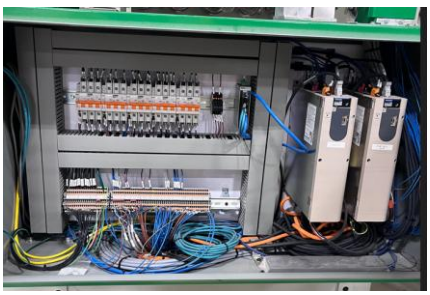



  - FM-550BG

- FM-550CG

- FM-550TH

- FM-550DS



Protection of Equipment

The system may have some of the following protection in order to protect the equipment

- Overcurrent

- Overloads for motors
- Ground fault
- Overvoltage
- Abnormal temperature
- Incorrect phases or loss of phases
- Overspeed of machines

- The cabinets have a 24VDC power supply (Phoenix Contact TRIO-PS). This power supply protects 24VDC circuits from surges and overvoltages via integral protection

TRIO-PS-2G/3AC/24DC/20 - Power supply unit

2903155

https://www.phoenixcontact.com/pc/products/2903155

Comments	Criterion A

Surge voltage load (surge)

Standards/regulations	EN 61000-4-5

Surge voltage load (surge)

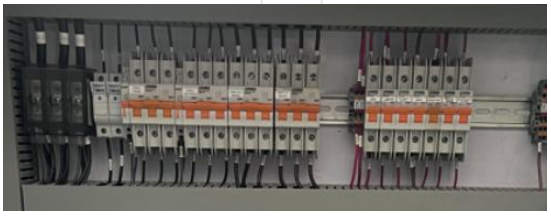
Input	1 kV (Test Level 1 - symmetrical)
	2 kV (Test Level 1 - asymmetrical)
Output	0.5 kV (Test Level 1 - symmetrical)
	0.5 kV (Test Level 1 - asymmetrical)
Signal	1 kV (Test Level 2 - asymmetrical)
Comments	Criterion B

Output data

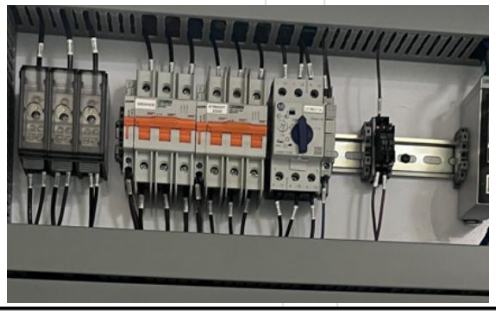
Efficiency	> 93 % (400 V AC)
	500 V AC
Output characteristic	U/I with dynamic load reserve
Nominal output voltage	24 V DC ±1 %
Setting range of the output voltage (U_{Set})	24 V DC ... 28 V DC (> 24 V DC, constant capacity restricted)
Nominal output current (I_N)	20 A
Dynamic Boost ($I_{Dyn.Boost}$)	30 A (5 s)
Derating	> 60 °C ... 70 °C (2.5 %/K)
Protection against overvoltage at the output (OVP)	≤ 30 V DC
Control deviation	< 1 % (change in load, static 10 % ... 90 %)
	< 3 % (Dynamic load change 10 % ... 90 %, 10 Hz)

- Each cabinet has proper protection for the equipment. Surge protection for overvoltage was noted in the section above for all the 120V / control circuits. The VFD's have integral parameters/settings to protect the motors also.
  - FM-210 : **OKAY**

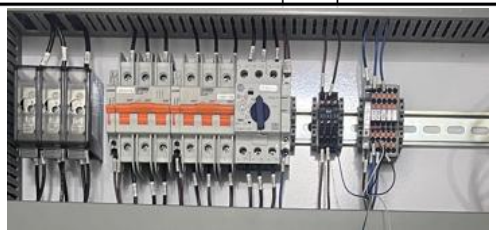
FM-210 Main Panel Load Protection				
Load	Full Load Amps	Protection	Overcurrent Trip [A]	Trip Ratio to FLA
Master VFD	5.5	Thermal Magnetic Circuit Breaker	7	127%
Slave VFD	5.5	Thermal Magnetic Circuit Breaker	7	127%
Outfeed	3.4	Thermal Magnetic Circuit Breaker	4	118%
Front Right Panel	23.1	Thermal Magnetic Circuit Breaker	30	130%
Front Left Panel	23.1	Thermal Magnetic Circuit Breaker	30	130%



FM-210 Front Left Panel Load Protection				
Load	Full Load Amps	Protection	Overcurrent Trip [A]	Trip Ratio to FLA
Left Groover	18	Thermal Magnetic Circuit Breaker	25	139%
Traverse Servo	3.5	Thermal Magnetic Circuit Breaker	4	114%
Left Belt OL	1.6	Motor Circuit Protector	1.6	100%



FM-210 Front Right Panel Load Protection				
Load	Full Load Amps	Protection	Overcurrent Trip [A]	Trip Ratio to FLA
Right Groover	18	Thermal Magnetic Circuit Breaker	25	139%
Straight Edge Servo	3.5	Thermal Magnetic Circuit Breaker	4	114%
Right Belt OL	1.6	Motor Circuit Protector	1.6	100%



- FM-550BG : **OKAY**

Protection				
Load	Full Load Amps	Protection	Overcurrent Trip [A]	Trip Ratio to FLA
Groover #1	18	Thermal Magnetic Breaker	25	139%
Transport	3.4	Thermal Magnetic Breaker	4	118%
Groover #2	18	Thermal Magnetic Breaker	25	139%
Various 120V & 24V Loads	-	Thermal Magnetic Breaker	Varies	-

- FM-550CG : **OKAY**

Protection				
Load	Full Load Amps	Protection	Overcurrent Trip [A]	Trip Ratio to FLA
Center Groover	20	Thermal Magnetic Breaker	25	125%
210 Rear Panel	-	Thermal Magnetic Breaker	12	-
Various 120V & 24V Loads	-	Thermal Magnetic Breakers	Varies	-

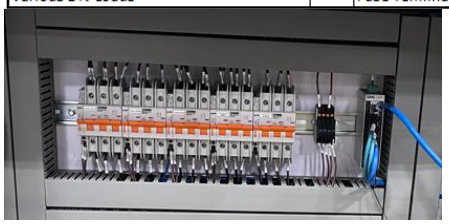
- FM-550TH : **OKAY**

Protection				
Load	Full Load Amps	Protection	Overcurrent Trip [A]	Trip Ratio to FLA
Infeed	3.4	Thermal Magnetic Breakers	4	118%
Transport	3.4	Thermal Magnetic Breakers	4	118%
Right Toe Horizontal	7.3	Thermal Magnetic Breakers	8	110%
Left Toe Horizontal	7.3	Thermal Magnetic Breakers	8	110%
Right Toe Vertical	7.3	Thermal Magnetic Breakers	8	110%
Left Toe Vertical	7.3	Thermal Magnetic Breakers	8	110%
Infeed Roll Horizontal	3.5	Thermal Magnetic Breakers	4	114%
Right Toe Position	3.5	Thermal Magnetic Breakers	4	114%
Various 120V & 24V Loads	-	Thermal Magnetic Breakers	Varies	-

- FM-550DS : **OKAY**

Drill Unit - Main Control Panel Protection				
Load	Full Load Amps	Protection	Overcurrent Trip [A]	Trip Ratio to FLA
Infeed Conveyor	3.4	Thermal Magnetic Breaker	4	118%
Back Drill Row	9.2	Thermal Magnetic Breaker	10	109%
Center Drill Row	9.2	Thermal Magnetic Breaker	10	109%
Front Drill Row	9.2	Thermal Magnetic Breaker	10	109%
Back Infeed Vertical	3.5	Thermal Magnetic Breaker	4	114%
Back Outfeed Vertical	3.5	Thermal Magnetic Breaker	4	114%
Front Infeed Vertical	3.5	Thermal Magnetic Breaker	4	114%
Front Outfeed Vertical	3.5	Thermal Magnetic Breaker	4	114%
Servo Panel Power Feed	-	Thermal Magnetic Breaker	10	-
Conveyor Panel Power	-	Thermal Magnetic Breaker	10	-
Drill Station Hold Down	-	Thermal Magnetic Breaker	4	-
Left Drill #1	3.5	Motor Circuit Protector	3.5	100%
Left Drill #2	3.5	Motor Circuit Protector	3.5	100%
Left Drill #3	3.5	Motor Circuit Protector	3.5	100%
Middle Drill #1	3.5	Motor Circuit Protector	3.5	100%
Middle Drill #2	3.5	Motor Circuit Protector	3.5	100%
Middle Drill #3	3.5	Motor Circuit Protector	3.5	100%
Servo Drill #1	3.5	Motor Circuit Protector	3.5	100%
Servo Drill #2	3.5	Motor Circuit Protector	3.5	100%
Servo Drill #3	3.5	Motor Circuit Protector	3.5	100%
Various 120V & 24V Loads	-	Thermal Magnetic Breaker	Varies	-

Drill Unit - Conveyor Panel Protection				
Load	Full Load Amps	Protection	Overcurrent Trip [A]	Trip Ratio to FLA
Clamp Servo	5.4	Thermal Magnetic Breaker	6	111%
Horizontal Drill	3.5	Thermal Magnetic Breaker	4	114%
Outfeed Belt	2	Thermal Magnetic Breaker	3	150%
210 Popup Belts	2	Thermal Magnetic Breaker	3	150%
210 Roller Wheels	2	Thermal Magnetic Breaker	3	150%
Various 24V Loads	-	Fuse Terminals + Fuses	-	-



Grounding & Bonding

The system shall be installed in accordance with NFPA 70, Article 250 for grounding & bonding. The equipment grounding conductor must be identified with the word “GROUND” or be identified with the GND symbol.

Corrective Actions were Required

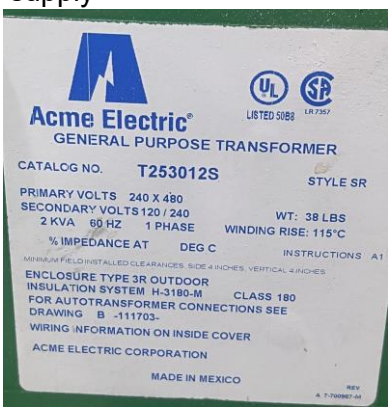
- FM-210
  - Ground symbols were not present in the initial evaluation, so they were placed after the initial evaluation was completed
  - The enclosure’s door was not bonded, so a ground symbol + bonding strap was installed
- FM-550BG
  - Ground symbols were not present in the initial evaluation, so they were placed after the initial evaluation was completed
  - The enclosure’s door was not bonded, so a ground symbol + bonding strap was installed
- FM-550CG
  - The enclosure’s door was not bonded, so a ground symbol + bonding strap was installed
- FM-550TH
  - Ground symbols were not present in the initial evaluation, so they were placed after the initial evaluation was completed
  - The enclosure’s door was not bonded, so a ground symbol + bonding strap was installed

- FM-550DS
  - Ground symbols were not present in the initial evaluation, so they were placed after the initial evaluation was completed
  - The enclosure's door was not bonded, so a ground symbol + bonding strap was installed

Control Circuits & Control Functions

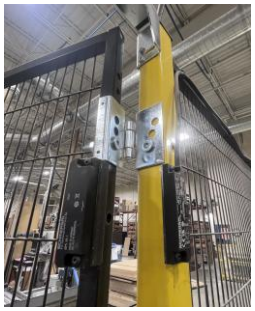
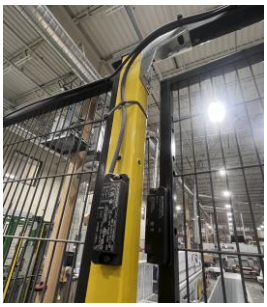
The AC control circuit must come from a control transformer must not exceed 120VAC & maximum 1kA available fault current. Any DC control circuit must be less than 250 VDC. All control circuits must have overcurrent protection. All safety/start/stop functions must work as intended. Interlocks shall be in place to ensure machine fails safely. Emergency stops shall keep the machinery de-energized until safety conditions are reset (shouldn't restart, but act as a permissive to the machinery).

- All of the control circuits are derived from a control XFMR(s) within the industrial machinery. There are 120VAC and 24VDC control circuits. They are protected on the 120VAC side with a surge protector and the 24VDC side with integral SPD in the DC power supply



- The safety start/stop functions work as designed. They were tested onsite and confirmed to be functioning properly. The light curtains & door contacts prevent an operator from being in an unsafe area while the machine is operating
  - Emergency Stop Buttons

  - Proximity/Door Switches

- Light Curtains

Operator Interface and Control Devices

The operator interface must be readily accessible to the machine. Control devices must be mounted securely / installed in compliance with the manufacturer and they must be protected from accidental operation / false signal to the machine. Color indicators shall be the following colors for each function:

- **Start or Normal Conditions** (Green but Black, White, or Gray)
- **Stop** (Red but Black, White, or Gray is permitted for non-emergencies)
- **Emergency Stop or Emergency Conditions** (Red)
  - Must be RED with Mushroom-head Type & yellow background for pushbutton-operated switches. Pull-cord operated switches are also valid.
- **Abnormal Conditions** (Yellow or Amber)
- **Push-Button that Causes Movement** (Black, but White, Gray, Blue is permitted)
- **Push-Button for Resets** (Blue, but Black, White, Gray, and RED if stop/emergency reset)
- **Mandatory Conditions** (Blue)
- **Neutral Conditions** (White)

  - The control buttons follow the standard colors listed above and they are mounted to prevent nuisance signals. All other controls are done from the HMI screen(s)
    - JOG Button : Black

    - Reset Button : Blue with White R


- Emergency Stop – Red/Yellow

Control Equipment: Location, Mounting, and Enclosures

All enclosures must be mounted so it allows maintenance, protection against environmental influences, and allows normal operation of the machinery. Exposed, live electrical terminations must be protected. Mechanical tubing, piping, valves, etc to handle gas, liquid, or air must not be located within the enclosure. Electrical working spaces defined in NFPA 70, Article 110 shall be followed for the enclosure and its doors.

- The enclosures are mounted in compliance with NFPA 79 and NEC working spaces
- There are not any tubing, hoses, etc that are located within the electrical enclosures
- Everything is installed in compliance

Conductors, Cables, and Flexible Cords

All cabling/conductors shall be identified and installed in accordance with their intended use. Conductors must be copper with appropriate insulation and ampacity rating not less than 125% of the full load current

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

The ampacity rating must take into account deration factors such as more than three current-carrying conductors in raceway, temperature, buried, etc. The wire's insulation shall be rated for all voltage levels present within the raceway.

- FM-210 : **Compliant with NFPA 79**

FM-210 Main Panel Conductors				
Load	Full Load	Wire Size/Type	Wire Amp Rating @ 75 Deg C	Overcurrent Trip [A]
Master VFD	5.5	#14 CU	20	7
Slave VFD	5.5	#14 CU	20	7
Outfeed	3.4	#14 CU	20	4
Front Right Panel	23.1	#10 CU	35	30
Front Left Panel	23.1	#10 CU	35	30
Control Conductors	-	#18 to #12	-	OKAY

FM-210 Front Left Panel Conductors				
Load	Full Load	Wire Size/Type	Wire Amp Rating @ 75 Deg C	Overcurrent Trip [A]
Left Groover	18	#12 CU	25	25
Traverse Servo	3.5	#14 CU	20	4
Left Belt OL	1.6	#18 CU	-	1.6
Control Conductors	-	#18 to #12	-	OKAY

FM-210 Front Right Panel Conductors				
Load	Full Load	Wire Size/Type	Wire Amp Rating @ 75 Deg C	Overcurrent Trip [A]
Right Groover	18	#12 CU	25	25
Straight Edge Servo	3.5	#14 CU	20	4
Right Belt OL	1.6	#18 CU	-	1.6
Control Conductors	-	#18 to #12	-	OKAY

- FM-550BG : **Compliant with NFPA 79**

Conductors				
Load	Full Load	Wire Size/Type	Wire Amp Rating @ 75 Deg C	Overcurrent Trip [A]
Groover #1	18	#12 CU	25	25
Transport	3.4	#14 CU	20	4
Groover #2	18	#12 CU	25	25
Control Conductors	-	#18 to #12	-	OKAY

- FM-550CG : **Compliant with NFPA 79**

Conductors				
Load	Full Load	Wire Size/Type	Wire Amp Rating @ 75 Deg C	Overcurrent Trip [A]
Center Groover	20	#12 CU	25	25
210 Rear Panel	-	#14 CU	20	12
Control Conductors	-	#18 CU to #12 CU	-	-

- FM-550DS : **Compliant with NFPA 79**

Drill Unit - Main Control Panel Protection				
Load	Full Load	Wire Size/Type	Wire Amp Rating @ 75 Deg C	Overcurrent Trip [A]
Infeed Conveyor	3.4	#14 CU	20	4
Back Drill Row	9.2	#14 CU	20	10
Center Drill Row	9.2	#14 CU	20	10
Front Drill Row	9.2	#14 CU	20	10
Back Infeed Vertical	3.5	#14 CU	20	4
Back Outfeed Vertical	3.5	#14 CU	20	4
Front Infeed Vertical	3.5	#14 CU	20	4
Front Outfeed Vertical	3.5	#14 CU	20	4
Servo Panel Power Feed	-	#14 CU	20	10
Conveyor Panel Power	-	#14 CU	20	10
Drill Station Hold Down	-	#14 CU	20	4
Left Drill #1	3.5	#18 CU	-	3.5
Left Drill #2	3.5	#18 CU	-	3.5
Left Drill #3	3.5	#18 CU	-	3.5
Middle Drill #1	3.5	#18 CU	-	3.5
Middle Drill #2	3.5	#18 CU	-	3.5
Middle Drill #3	3.5	#18 CU	-	3.5
Servo Drill #1	3.5	#18 CU	-	3.5
Servo Drill #2	3.5	#18 CU	-	3.5
Servo Drill #3	3.5	#18 CU	-	3.5
Control Conductors	-	#18 Cu to #14 Cu	-	-

Drill Unit - Conveyor Panel Protection				
Load	Full Load	Wire Size/Type	Wire Amp Rating @ 75 Deg C	Overcurrent Trip [A]
Clamp Servo	5.4	#14 CU	20	6
Horizontal Drill	3.5	#18 CU	-	4
Outfeed Belt	2	#18 CU	-	3
210 Popup Belts	2	#18 CU	-	3
210 Roller Wheels	2	#18 CU	-	3
Control Conductors	-	#18 Cu to #14 Cu	-	-

- FM-550TH : **Compliant with NFPA 79**

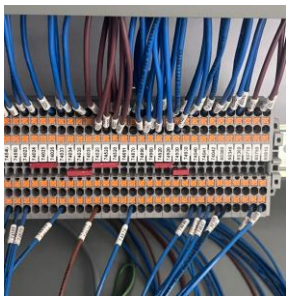
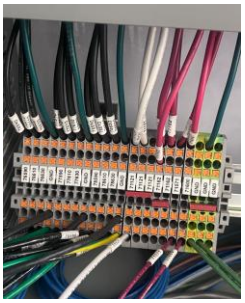
Protection				
Load	Full Load	Wire Size/Type	Wire Amp Rating @ 75 Deg C	Overcurrent Trip [A]
Infeed	3.4	#14 CU	20	4
Transport	3.4	#14 CU	20	4
Right Toe Horizontal	7.3	#14 CU	20	8
Left Toe Horizontal	7.3	#14 CU	20	8
Right Toe Vertical	7.3	#14 CU	20	8
Left Toe Vertical	7.3	#14 CU	20	8
Infeed Roll Horizontal	3.5	#14 CU	20	4
Right Toe Position	3.5	#14 CU	20	4
Control Conductors	-	#18 cu to #12 cu	-	-

Wiring Practices

All connections must be installed so it prevents accidental loosening. Terminals must be rated for the wire and labeled clearly. In no instance shall the wire cross over the terminals for panel/field wiring. Wires shall be run from source to destination without splices or joints within the enclosure. If an enclosure is supplied from more than one power source, the power wiring must be run in separate raceways for each disconnecting means.

Exposed cables are permitted along machinery supports, but care should be taken to ensure the cabling doesn't inhibit maintenance (machine guards, grease ports, gauges, etc). Cabling must be supported adequately so sagging or damage doesn't occur. Cables subjected to damage must be protected and installed in compliance with NFPA 70. Grounding conductors must be identified by color green with or without yellow stripes.

- Conductor color codes match NFPA 79 standards. Ground cables are adequate. Conductors are installed professionally and do not cross over terminals / wireways. Splices were not observed. Cables/hoses/tubing appear to be supported well.

- **Corrective Actions Were Required**
- FM-210
  - The wire insulation was stripped back too far before the wire was terminated. This was corrected after the initial report, so the wire is trimmed/terminated properly so bare conductor is not exposed
  - Multiple Wires were landed on Screwless Terminal that is not rated for more than 1 wire. This was corrected after the initial report.

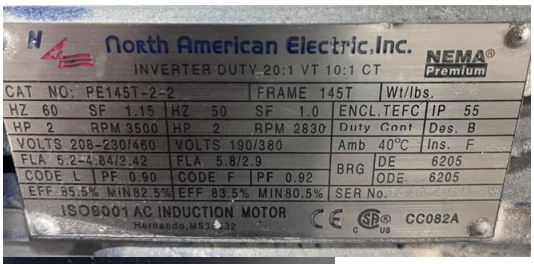
- FM-550BG
  - The wire insulation was stripped back too far before the wire was terminated. This was corrected after the initial report, so the wire is trimmed/terminated properly so bare conductor is not exposed

- Assemblies Were not Secured Well
  - It was observed that there were several assemblies that were not secured well. This was corrected after the initial report, so the hoses, cables, raceways, etc could not be snagged while the machine was operational.

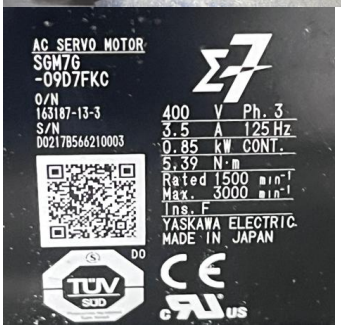
Electric Motors and Associated Equipment

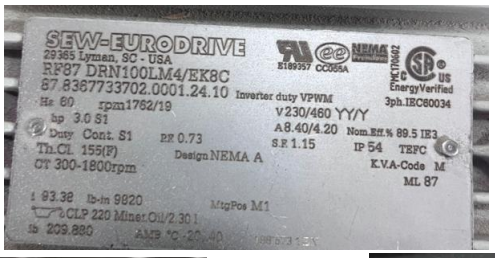
All motors shall be mounted so they are adequately protected from damage, accessible for maintenance, have proper cooling, and can be easily replaced. Motors shall be selected to match the connected process conditions. Motors must have nameplate data marked in compliance with NFPA 70, Article 430, and they must have appropriate motor controllers and protection

- The industrial machine is mounted appropriately. Each motor has appropriate protection & nameplate data as shown below


North American Electric,Inc.
INVERTER DUTY 20:1 VT 10:1 CT
NEMA Premium
CAT NO: PE145T-2-2
FRAME 145T
Wt/lbs.
ISO9001 AC INDUCTION MOTOR
CC082A

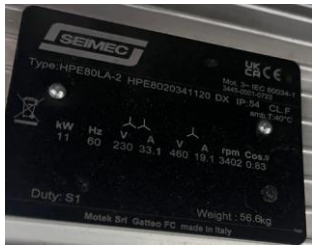

SEIMEC
Type:HPE80LA-2 HPE802034121 SX IP:54 CL.F
kW Hz V A V A rpm Cos.φ
11 60 230 33.1 460 19.1 3402 0.83
Duty: S1
Weight : 56,6kg


AC SERVO MOTOR
SGM7G
-09D7FKC
400 V Ph. 3
3.5 A 125 Hz
0.85 kW CONT.
5.39 N·m
Rated 1500 min-1
Max. 3000 min-1
Ins. F
YASKAWA ELECTRIC
MADE IN JAPAN


SEW-EURODRIVE
29365 Lyman, SC - USA
RF87 DRN100LM4/EK8C
87.8367733702.0001.24.10 Inverter duty VPWM
3ph.IEC60034
EnergyVerified


SEW-EURODRIVE
29365 Lyman, SC - USA
RF87 DRN100LM4/EK8C
87.8367733701.0001.24.10 Inverter duty VPWM
EnergyVerified


AC SERVO MOTOR
SGM7G
-09D7FK1
400 V Ph. 3
3.5 A 125 Hz
0.85 kW CONT.
Rated 1500 min-1
Max. 3000 min-1
Ins. F
YASKAWA ELECTRIC
MADE IN JAPAN


SEIMEC
Type:HPE80LA-2 HPE802034120 DX IP:54 CL.F
kW Hz V A V A rpm Cos.φ
11 60 230 33.1 460 19.1 3402 0.83
Duty: S1
Weight : 56.6kg
Motek Srl Gatteo FC made in Italy


INVERTER DUTY RATINGS

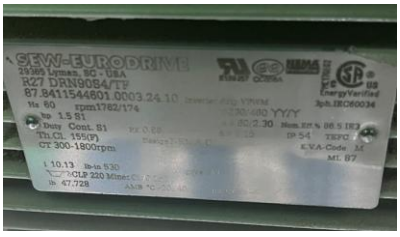

AC SERVO MOTOR
SGM7G
-09D7FKC
400 V Ph. 3
3.5 A 125 Hz
0.85 kW CONT.
5.39 N·m
Rated 1500 min-1
Max. 3000 min-1
Ins. F
YASKAWA ELECTRIC
MADE IN JAPAN

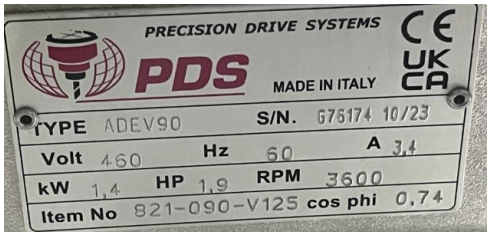

SEIMEC
Type:HPE80LA-2 HPE802034121 SX IP:54 CL.F
kW Hz V A V A rpm Cos.φ
11 60 230 33.1 460 19.1 3402 0.83
Duty: S1
Weight : 56.6kg
Motek Srl Gatteo FC made in Italy


INVERTER DUTY RATINGS

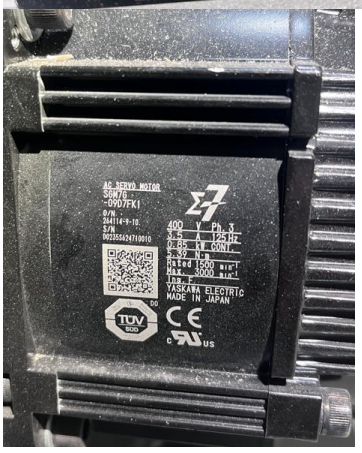

SEW-EURODRIVE
R47 DRN90L4/TF
87.8397203601.0001X24.10 Inverter duty VPWM
3ph.IEC60034
EnergyVerified


SEW-EURODRIVE
R27 DRN90S4/TF
87.8411544601.0002.24.10


SEW-EURODRIVE
R27 DRN90S4/TF
87.8411544601.0003.24.10
EnergyVerified


PRECISION DRIVE SYSTEMS
PDS
MADE IN ITALY
TYPE ADEV90
S/N. G76174 10/23
Volt 460
Hz 60
A 3,4
kW 1,4
HP 1,9
RPM 3600
Item No 821-090-V125 cos phi 0,74


YASKAWA ELECTRIC
MADE IN JAPAN



Receptacles and Lighting

Receptacles for machinery must be GFCI-protected, supplied from grounded 120V source, have proper overcurrent protection, and be rated to withstand the environment it is installed in. Only lighting systems designed for use greater than 150V may be permitted; otherwise, lighting systems should be 120V for machinery. Lighting must have overcurrent protection, must not exceed 15 Amps, and must be rated for the physical environment.

- Machine is compliant with NFPA 79

Marking and Safety Signs

The equipment must be marked with supplier's name, trademark, and identifying symbol. Safety placards and markings must be permanent.

- Warning Label – *Potential Electric Shock and Arc Flash Hazard*
  - Place visibly on Enclosure when Voltage is greater than 50VAC or 60VDC
- The industrial machine has appropriate warning labels for arc flash & shock hazards

- Warning Label – *Does Not De-Energize All Exposed Parts When Disconnecting Means in (off) Position*
  - Place visibly on Enclosure next to disconnect when multiple sources are present
- **Corrective Action Was Required**
  - FM-550CG – a label was not present that indicated multiple power devices. This was corrected after the initial report.

- The industrial machine has appropriate warning labels where there are pinch points

- Nameplate
  - Required by manufacturer
    - Name of Supplier
    - Model, Serial Number, etc
    - Rated voltage, phase, frequency, and full-load current for each supply
    - Largest Motor or Load
    - Max Protective Device Threshold
    - Short Circuit Current Rating
    - Electrical Diagram Number(s) or Drawing Index

- The industrial machine has appropriate nameplate data for each enclosure. Refer to NFPA 670 section above

Technical Documentation

The machinery must have necessary information present for installation, operation, maintenance, and storage of the machine. This can be in the form of drawings, diagrams, charts, tables, etc. It must be stored onsite with the machine.

- The industrial machine has appropriate technical drawings stored with each control panel

NFPA 79 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

I hereby certify that I am a professional engineer, registered in the State of South Dakota and I do not benefit financially by the sale/manufacturing of the equipment evaluated within this report, I did not impose excessive financial preconditions to evaluate the equipment, and there were not any conflicts of interests in performing the evaluation. I attest that the evaluation and report was performed by me personally and is to the best of my knowledge complete and accurate.

Joshua Knighton

December 30, 2025

Date:

Joshua J. Knighton
Professional Engineer

Observation Log:

During the evaluation, differences between the observed installation and the governing standards are logged here with recommended actions to correct the issue (if required).

Any issue discovered that requires corrected actions must be corrected and re-evaluated before a final report will be sent to the Electrical Commission and the FEB label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

Observation Log			
Non-Compliance Issue No.	**Standard/Code Reference**	**Issue**	**Corrective Action Required**
1	NFPA 79	Center Groover does not have a single disconnecting means. It is fed from FM-210 for 120V control power	**YES** – label per NEC to indicate there are multiple sources & where the disconnecting means are located (460V + 120V). Each device must be rated for lock/out tag out disconnecting means **Corrected December 2025**
2	NFPA 79	There are multiple panels that have multiple wires terminated on terminals that are designed for a single wire	**YES** – install additional pass-thru terminals so 1 wire can be terminated to equipment that is designed for only 1 wire **Corrected December 2025**
3	NFPA 79	There are multiple panels that have multiple wires with bare conductor exposed on the termination	**YES** – the wire(s) should be trimmed / re-terminated so there is not bare conductor exposed at the termination **Corrected December 2025**
4	NFPA 79	There are multiple panels that does not have ground symbols at each bonding point	**YES** – a ground symbol sticker should be installed at all bond points (ground bar, enclosure door, etc) **Corrected December 2025**
5	NFPA 79	It was observed that there were multiple hoses, cables, raceways, etc that were not secured well	**YES** – all loose assemblies shall be secured so it is not possible to trip/snag the device accidentally **Corrected December 2025**
6	NFPA 79	It was observed that there is an anaconda flexible conduit used for the portable HMI cart	No - It is recommended to use a rated, portable cable & coil up / uncoil when required instead of leaving a conduit on the ground for someone to trip over **Corrected December 2025**

SOUTH DAKOTA DEPARTMENT OF LABOR AND REGULATION

SOUTH DAKOTA ELECTRICAL COMMISSION

217 West Missouri Avenue, Pierre, SD 57501
Tel: 605.773.3573 Toll-Free: 1.800.233.7765 Fax: 605.773.6213 dlr.sd.gov/electrical

MACHINERY DESIGNATION APPLICATION

Entity Name: OLM Food Solutions Contact Person: Brady Welu

Tel: (877) 841 – 1431

Address: 2930 W Maple St (STREET) Sioux Falls (CITY) SD (STATE) 57107 (ZIP)

Installation Address: : 2400 N Marietta Pl (STREET) Sioux Falls (CITY) SD (ZIP)

☑ Yes ☐ No: Entity presents application as official notice that Entity is designating the following equipment at the installation address as machinery.

Description of Machinery:
The Pattyn CC Machine is used for a unique manufacturing process at entity's location above. 3rd Party Evaluation for UL508a, NFPA 79, and NEC 670 Compliance by Muth Power Solutions (Joshua Jay Knighton). Field Evaluation Label (FEB) with unique identifier placed on the machinery. Specific labels for this machine include - (MPS-FEB-060020)

Name of Professional Engineer involved: Joshua Knighton License No.: 16721

Please answer the following questions:

☐ Yes ☑ No: The machinery as a packaged unit is available in a listed form.

☐ Yes ☑ No: Has an electrical standard been prepared or adopted to which the machinery should conform. (e.g. NRTL or NFPA 79: Electrical Standard for Industrial Machinery)

☑ Yes ☐ No: The machinery is specific electrical equipment for use by the applying entity and not a line as manufactured, stored, sold, installed, or attached.

☑ Yes ☐ No: A label indicating the installation complies with nationally recognized standards or tests determining suitable usage for said installation in manner utilized has been adhered to machinery by 3rd party conducting field listing.

☑ Yes ☐ No: In the opinion of the Entity the machinery complies with NEC 670.

☑ Yes ☐ No: Entity accepts responsibility and liability for the machinery.

☑ Yes ☐ No: Entity is of the opinion the machinery is safe for the use intended.

By my signature below, I do solemnly swear the statements made herein are true and correct to the best of my knowledge and belief. Completion of this application does not guarantee approval.

Name: Rick Schaff Position: Manager

SIGNATURE DATE: 01/05/2026

To Submit: Mail or fax to the South Dakota Electrical Commission (contact information at the top of this form).

Ensure your application includes:

☑ Signature and Date
☑ Attach Stamped Engineering plans

Field Evaluation of Non-Listed Industrial Machinery
MPS-FEB-060020

PATTYN CC (GT25003263)

01/05/2026

OLM Food Solutions
2400 N Marietta Pl, Sioux Falls
Minnehaha County, South Dakota

Revision	Description	Date
0.0	Initial Release - FAILED	2026-01-05
1.0	Initial Release - **PASSED**	2026-01-05

Muth Power Solutions

Summary:

PATTYN, CC (GT25003263) panel + connected equipment was installed without a recognized listing label. The panel + connected equipment was built solely for **OLM Food Solutions** and will only be used in their production processes. South Dakota's Electrical Commission requires an application to be submitted when there is ***"No Listing on Installation"***. The requirements for the machinery designation & to be approved by the commission and authority having jurisdiction (AHJ) is as follows:

- No Standard has been prepared or adopted
- Owner states machinery is safe for intended us
- The machinery is specific electrical equipment for use by applying entity and not a line as manufactured, stored, sold, installed, or attached
- Comply with Article 670 of NFPA 70
  - Nameplate Information
  - **Provide proof of compliance with NFPA 79 by licensed professional engineer**

The intent of this report is to show the findings of the evaluation by a professional engineer. If anything was discovered to be non-compliant, it'll be listed in the ***Observations Log*** at the end of the report. Any issues discovered that require corrective actions must be corrected before a final report will be sent to the South Dakota Electrical Commission and the Field Evaluation Body (FEB) label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

In compliance with NFPA 791, Muth Power Solutions (M.P.S) generated a unique serial number for the FEB label: **MPS-FEB-060020**. This serial number will be referenced on the machine label as well as in this evaluation report once the machinery is compliant with applicable standards.

Any performance testing is outside the scope and was not performed during this evaluation.

The following versions of codes / standards were used for this evaluation

- NFPA 70 National Electrical Code (2020)
- NFPA 79 Electrical Standard for Industrial Machinery (2024)
- NFPA 790 Competency of Third-Party Field Evaluation Bodies (2024)
- NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment (2024)

Overall Result of Evaluation:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of NFPA 70, Article 670:

Definition of Industrial Machinery [NFPA 70, Article 670.2]

A power-driven machine (or a group of machines working together in a coordinated manner), not portable by hand while working, that is used to process material by cutting; forming; pressure; electrical, thermal, or optical techniques; lamination; or a combination of these processes. It can include associated equipment used to transfer material or tooling, including fixtures, to assemble/disassemble, to inspect or test, or to package [The associated electrical equipment, including the logic controller(s) and associated software/logic together with the machine actuators and sensors, are considered as part of the industrial machine]

- The Pattyn CC-31 is a case closer machine. This machine processes cardboard boxes by receiving an erected box with a bag already inserted in it. It then forms the box by closing the cardboard tabs and sealing it. It then sends it out to be processed further on the conveyor line. This meets the definition of an industrial machine since it "forms" material.

Nameplate Data [NFPA 70, Article 670.3(A)]

The nameplate must be attached to the control equipment enclosure or machine with the following information

- Supply Voltage: **480VAC**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **0.4 kW or ~ 1A**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **0.24 kW**
- Electrical Drawing Number: **GT56F Sheets 1-34**

- The machine has a nameplate on it that is compliant with NEC 670

Supply Conductors [NFPA 70, Article 670.4(A)]

The supply conductors must have an ampacity rating not less than

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

- The CC-31 case closer/sealer machine is supplied from panel H3 with a 3P/15A 460V circuit with #12 CU conductors. Doing the above calculation, the resulted ampacity of the panel is around **1.0A.** This is compliant with NEC 670 since #12 CU is rated for 25A at 75 Deg C

Conductors				
Load	Full Load Amps	Wire Size/Type	Wire Amp Rating @ 75 Deg C	Overcurrent Trip
21M5F (Belts Motor)	0.63	#14 AWG	20A	1A
15G3C (24V Power Supply) - 480V Supply	0.28868	#14 AWG	20A	1A
15G3C (24V Power Supply) - 24V Output	10A	#14 AWG	20A	10A

Disconnecting Means [NFPA 70, Article 670.4(B)]

The electrical enclosure must have a disconnecting means since the machine is considered an individual unit. It is not required to have integral overcurrent protection.

- The panel has a single disconnecting means and it is fed from a single 3P/460V circuit breaker. This is compliant with NEC 670.

Overcurrent Protection [NFPA 70, Article 670.4(C)]

The electrical enclosure must have a single feeder circuit breaker or fuses when furnished as part of an industrial machine. The rating of the overcurrent device shall be sized on sum of

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

- The panel is supplied from H3 panelboard with a 15A 3P 460V circuit breaker (Eaton PDG23M0015). The above calculation results in approximately **1.20A**. Doing **1.2***1.25, the overcurrent protection results in **1.5A**. The nearest circuit breaker for this is 15A per 240.6 NEC table, so the feeder circuit breaker is compliant with NEC 670.

Short Circuit Current Rating [NFPA 70, Article 670.5]

The electrical enclosure must not be installed in a location where the maximum available fault current exceeds the nameplate rating.

- The panel is terminated on a motor circuit protector (140MT-C3E, which has a 65 kA SCCR at 480V). **Final SCCR is 10 kAIC**
  - The downstream fuses/fuse holders 15F3B & 15F3E are rated for 200 kAIC @ 480Y/277V
  - The pass thru terminals are rated for 10 kA
  - The motor contactor & safety contactors are protected by the input motor circuit breaker & has a series rating with the input motor circuit breaker
  - The DC components are fed from a DC power supply that limits the fault current from the ac input so the output is limited. This is done electronically, so it is okay to rate this power supply at 10 kA AC fault current
  - The fault current was calculated from the utility XFMR down to the CC-31 case sealer. An apparent power of 2500 kVA was used since the utility may have to increase the kVA size to handle the full load. With a 5.39% impedance, the maximum fault current at this node is approximately 3,456 A, so the 10 kA SCCR is compliant with NEC 670

FAULT CURRENT CALCULATION

Utility XFMR Rating:	2500 kVA	Transformer Phase:	3	Impedance (%Z):	5.39%	Fault Current (Inf. Bus):	55789.10 A	Utility XFMR Secondary Voltage	480					

Panel or Transformer Name	Feeder Length in Feet "L"	Upstream Available Fault Current "I"	Wire Material	Wire Size	Conduit Type	(Based on Wire and Conduit) "C"	Line-to-Line Voltage "E"	Number of Conductors "n"	$f = \frac{\sqrt{3} \times L \times I}{n \times C \times E}$	$M = \frac{1}{1+f}$	Available Fault Current Isc= M x I	Motor Contribution Isym(mot. cont.)= (Motor Full Load Amps) x 5	Total Available Fault Current Itot=Isc+Isym(mot.cont.)
CT-1	10	55,789	ALUMINUM	750 MCM	NON-MAGNETIC	23491	480	11	0.01	0.99	55358	0	**55358**
MDP-1	100	55,358	ALUMINUM	750 MCM	NON-MAGNETIC	23491	480	11	0.08	0.93	51386	0	**51386**
H1	25	51,386	ALUMINUM	250 MCM	STEEL	12122	480	4	0.10	0.91	46902	0	**46902**
H2	25	51,386	ALUMINUM	250 MCM	STEEL	12122	480	4	0.10	0.91	46902	0	**46902**
H3	45	51,386	ALUMINUM	250 MCM	STEEL	12122	480	2	0.34	0.74	38229	0	**38229**
CC-31 Case Closer	90	38,229	COPPER	12 AWG	STEEL	617	480	2	10.06	0.09	3456	0	**3456**

Surge Protection [NFPA 70, Article 670.6]

The electrical enclosure shall have proper surge protection if the upstream supply circuit does not protect the enclosure

- The CC-31 Case Closer/Sealer is fed from H3, which is fed from MDP-1. MDP-1 was supplied with appropriate surge protector (240 kA), so this is compliant with NEC 670

NFPA 70, Article 670 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of UL508A:

Part 2 Enclosures
The enclosure shall have the proper rating for the environment it is installed in. It shall be constructed to support the weight within as well as the environmental forces such as wind & snow. It shall have appropriate markings to indicate manufacturer's intent.

Part 2 Industrial Machinery
Shall comply with NFPA 79 and other standards listed in sections 65 to 67

UL508A Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Construction Requirements of NFPA 79:

System must comply with sections 4 – 17 of NFPA 79. Some of the higher priority requirements are summarized below that are accompanied with onsite pictures of the actual gear. Other specific sections/requirements will be called out as needed, if it's applicable to the equipment being evaluated.

Electrical Supply
The system shall be able to operate within 90%-110% of voltage rating, 99%-101% frequency rating, and harmonic THD of 0%-10% for short periods of time.

- The supply circuit is 480V/3ph 60 Hz. It was measured to be within the tolerances listed in NFPA 79, so the supply circuit is compliant

Environmental
The system shall be protected from the environment it is installed within.

- The system is installed in an enclosure rated for the environment (stainless steel)

Available Fault Current

The system shall have a larger withstand short circuit rating than the maximum available fault current on the line terminals of the system's disconnecting means.

- See NEC 670 section above that shows compliance with NFPA 79

Disconnecting Means

The system shall have a single disconnecting means from the single supply circuit wherever possible. The line side must be protected from unintentional direct contact by users when the enclosure door is opened. A disconnecting means is not required for circuits less than 50VAC RMS or 60VDC.

- See NEC 670 section above that shows compliance with NFPA 79

Protection from Electrical Hazards

The system shall have live parts insulated from users and openings/windows must meet UL requirements. It must have integral fault protection for accidental connections to live parts. Any interlocked electrical supply circuits must be indicated on the enclosure with a warning placard. An arc flash hazard warning placard must be placed on the enclosures with live electrical present.

- The enclosure has integral fault protection for each circuit on the machine. There are not exposed parts, and the electrical supply is not interlocked. There are appropriate warning placards on the machine.

Protection of Equipment

The system may have some of the following protection in order to protect the equipment

- Overcurrent
- Overloads for motors
- Ground fault
- Overvoltage
- Abnormal temperature
- Incorrect phases or loss of phases
- Overspeed of machines

- Overcurrent

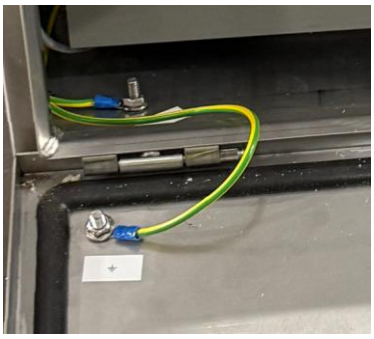
- The 24vdc power supply is protected with fuses on the input & output that are appropriate for the FLA

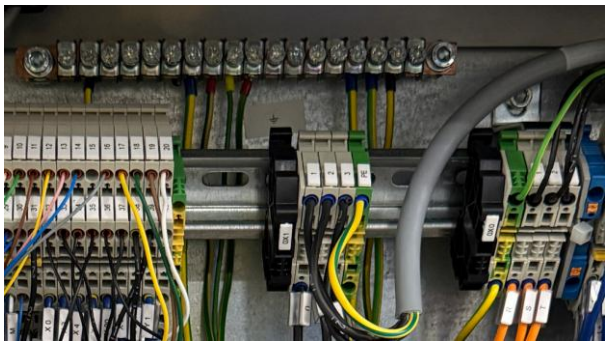
- Overloads/Motor circuit protector
  - The motor has an overload/mcp that serves as the main disconnecting means for the panel + overload protection for the belt motor. The MCP is set for 1A. The MCP can be adjusted from 1.0 to 1.6A. The documentation did not show this information, so it was looked at during the evaluation
    - The motor is 0.24 kW with 0.62 PF with 74% efficiency, so the FLA results in ~ 0.63A. With the 0.3A also being supplied from the MCP, the 1A setting is appropriate for the motor
  - 

Grounding & Bonding

The system shall be installed in accordance with NFPA 70, Article 250 for grounding & bonding. The equipment grounding conductor must be identified with the word “GROUND” or be identified with the GND symbol.

- The bonding points are all identified with the ground symbol





Control Circuits & Control Functions

The AC control circuit must come from a control transformer must not exceed 120VAC & maximum 1kA available fault current. Any DC control circuit must be less than 250 VDC. All control circuits must have overcurrent protection. All safety/start/stop functions must work as intended. Interlocks shall be in place to ensure machine fails safely. Emergency stops shall keep the machinery de-energized until safety conditions are reset (shouldn't restart, but act as a permissive to the machinery).

- The safety circuits were tested and were fully working/functioning as intended. The E-stop circuits are all supplied from a 24VDC control circuit (Omron S8VK-T24024 24VDC/10A Power Supply) and connect to a safety relay that inhibits/"power guards" the critical motors & devices. A reset button must be pressed to reset the emergency condition
    - This power supply has integral protection for overvoltage, short circuit proof, surge, etc and it has appropriate overcurrent protection

	Overload protection	Yes, automatic reset
	Overvoltage protection	Yes, Shut off the input voltage and turn on the input again

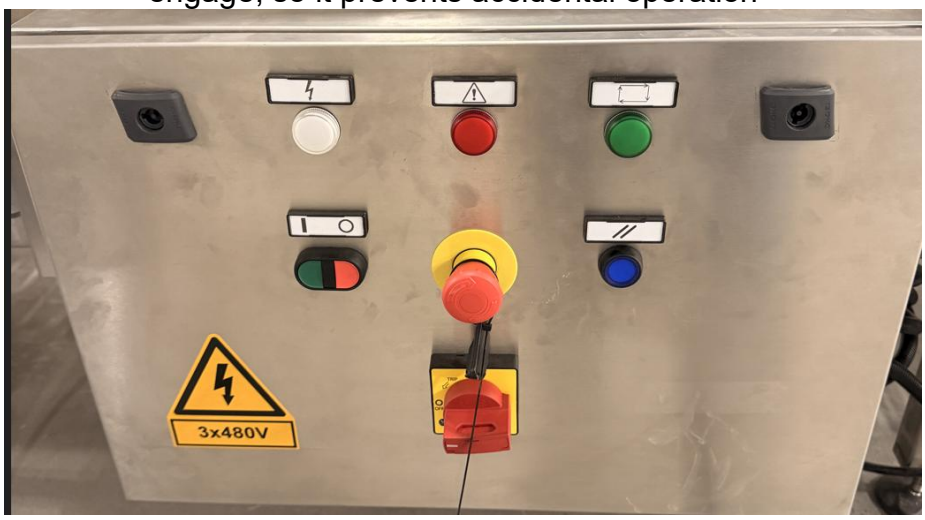
Operator Interface and Control Devices

The operator interface must be readily accessible to the machine. Control devices must be mounted securely / installed in compliance with the manufacturer and they must be protected from accidental operation / false signal to the machine. Color indicators shall be the following colors for each function:

- **Start or Normal Conditions** (Green but Black, White, or Gray)
- **Stop** (Red but Black, White, or Gray is permitted for non-emergencies)
- **Emergency Stop or Emergency Conditions** (Red)
    - Must be RED with Mushroom-head Type & yellow background for pushbutton-operated switches. Pull-cord operated switches are also valid.

- **Abnormal Conditions** (Yellow or Amber)
- **Push-Button that Causes Movement** (Black, but White, Gray, Blue is permitted)
- **Push-Button for Resets** (Blue, but Black, White, Gray, and RED if stop/emergency reset)
- **Mandatory Conditions** (Blue)
- **Neutral Conditions** (White)

  - The panel has compliant control/interface devices
    - White Light : shows the panel has aux power
    - Red Light : shows there is an emergency condition
    - Green Light : shows machine is working without any issues
    - Blue PB : resets the system
    - Green PB : starts the system
    - Red PB : stops the system
    - Estop : stops the panel for emergency conditions & requires a twisting motion to engage, so it prevents accidental operation



Control Equipment: Location, Mounting, and Enclosures

All enclosures must be mounted so it allows maintenance, protection against environmental influences, and allows normal operation of the machinery. Exposed, live electrical terminations must be protected. Mechanical tubing, piping, valves, etc to handle gas, liquid, or air must not be located within the enclosure. Electrical working spaces defined in NFPA 70, Article 110 shall be followed for the enclosure and its doors.

- The machine + connected cables / hoses / tubing is installed in compliant with NPFA 79

Conductors, Cables, and Flexible Cords

All cabling/conductors shall be identified and installed in accordance with their intended use. Conductors must be copper with appropriate insulation and ampacity rating not less than 125% of the full load current

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

The ampacity rating must take into account deration factors such as more than three current-carrying conductors in raceway, temperature, buried, etc. The wire's insulation shall be rated for all voltage levels present within the raceway.

- The conductors were all observed to be appropriate sizes for their respective FLA and they're compliant with NPFA 79

Wiring Practices

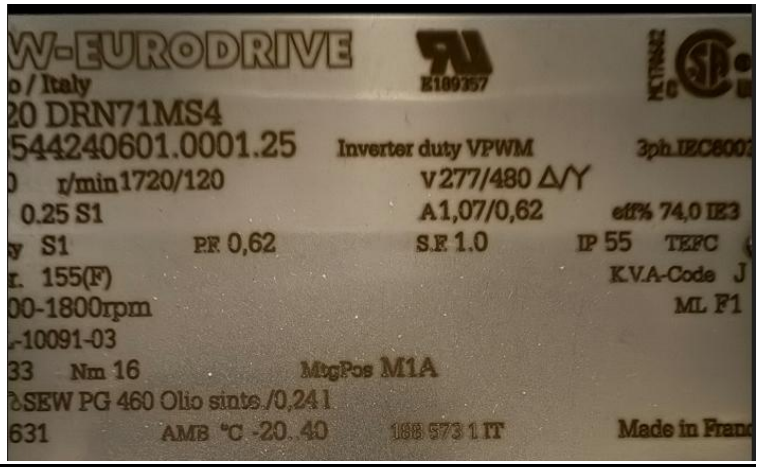
All connections must be installed so it prevents accidental loosening. Terminals must be rated for the wire and labeled clearly. In no instance shall the wire cross over the terminals for panel/field wiring. Wires shall be run from source to destination without splices or joints within the enclosure. If an enclosure is supplied from more than one power source, the power wiring must be run in separate raceways for each disconnecting means. Exposed cables are permitted along machinery supports, but care should be taken to ensure the cabling doesn't inhibit maintenance (machine guards, grease ports, gauges, etc). Cabling must be supported adequately so sagging or damage doesn't occur. Cables subjected to damage must be protected and installed in compliance with NFPA 70. Grounding conductors must be identified by color green with or without yellow stripes.

- The wire was installed in a professional manner, and in no instance were any wires loose, had exposed conductors on the termination, crossed over things, etc. The wire/raceway was installed in compliance with NFPA 79

Electric Motors and Associated Equipment

All motors shall be mounted so they are adequately protected from damage, accessible for maintenance, have proper cooling, and can be easily replaced. Motors shall be selected to match the connected process conditions. Motors must have nameplate data marked in compliance with NFPA 70, Article 430, and they must have appropriate motor controllers and protection.

- The motor's nameplate is compliant with NFPA 79 & it is installed in a professional manner



Receptacles and Lighting

Receptacles for machinery must be GFCI-protected, supplied from grounded 120V source, have proper overcurrent protection, and be rated to withstand the environment it is installed in. Only lighting systems designed for use greater than 150V may be permitted; otherwise, lighting systems should be 120V for machinery. Lighting must have overcurrent protection, must not exceed 15 Amps, and must be rated for the physical environment.

- There were not any receptacles or lighting supplied from the machine's 480V control panel, so this is not applicable

Marking and Safety Signs

The equipment must be marked with supplier's name, trademark, and identifying symbol. Safety placards and markings must be permanent.

- Warning Label – *Potential Electric Shock and Arc Flash Hazard*
  - Place visibly on Enclosure when Voltage is greater than 50VAC or 60VDC
    - The machine has appropriate safety placards

- Nameplate
  - Required by manufacturer
    - Name of Supplier
    - Model, Serial Number, etc
    - Rated voltage, phase, frequency, and full-load current for each supply

- Largest Motor or Load
- Max Protective Device Threshold
- Short Circuit Current Rating
- Electrical Diagram Number(s) or Drawing Index

- See NEC 670 section above for nameplate information

Technical Documentation
The machinery must have necessary information present for installation, operation, maintenance, and storage of the machine. This can be in the form of drawings, diagrams, charts, tables, etc. It must be stored onsite with the machine.

- Technical documentation was observed with the machine.

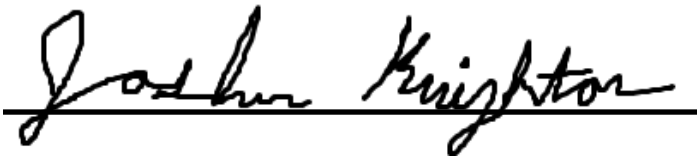
NFPA 79 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

I hereby certify that I am a professional engineer, registered in the State of South Dakota and I do not benefit financially by the sale/manufacturing of the equipment evaluated within this report, I did not impose excessive financial preconditions to evaluate the equipment, and there were not any conflicts of interests in performing the evaluation. I attest that the evaluation and report was performed by me personally and is to the best of my knowledge complete and accurate.



January 5, 2026

Date:

Joshua J. Knighton
Professional Engineer

Observation Log:

During the evaluation, differences between the observed installation and the governing standards are logged here with recommended actions to correct the issue (if required).

Any issue discovered that requires corrected actions must be corrected and re-evaluated before a final report will be sent to the Electrical Commission and the FEB label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

Observation Log			
Non-Compliance Issue No.	**Standard/Code Reference**	**Issue**	**Corrective Action Required**
1	NFPA 79	There are not grounding symbols at all bond points	**YES** – install ground symbol stickers at all of the bond points **Corrected same day evaluation 01/05/2026**
2	NFPA 79	Technical documentation was not stored with the machine	**YES** – print / locate documentation & store with the machine **Corrected same day evaluation 01/05/2026**
3	NEC 430	The MCP for the belt motor was set at 1A. This may cause issues for the overload ***Correction after evaluation was done*** nameplate showed 1A, but this is the combination of motor + DC power supply and not just the motor by itself	NO – it is recommended to adjust the trip setting per 430.32(1) 125% FLA : if SF on nameplate is 1.15 or greater or 40 DegC Rise or Less 115% FLA : if doesn't meet the above **Motor was checked to be 0.24 kW with PF 0f 0.62 & efficiency of 74%, so 1A is appropriate for the belt motor & DC Power Supply protection. Motor had a SF of 1.0**

SOUTH DAKOTA DEPARTMENT OF LABOR AND REGULATION

SOUTH DAKOTA ELECTRICAL COMMISSION

217 West Missouri Avenue, Pierre, SD 57501
Tel: 605.773.3573 Toll-Free: 1.800.233.7765 Fax: 605.773.6213 dlr.sd.gov/electrical

MACHINERY DESIGNATION APPLICATION

Entity Name: OLM Food Solutions Contact Person: Brady Welu

Tel: (877) 841 – 1431

Address: 2930 W Maple St (STREET) Sioux Falls (CITY) SD (STATE) 57107 (ZIP)

Installation Address: : 2400 N Marietta Pl (STREET) Sioux Falls (CITY) SD (ZIP)

☉ Yes ○ No: Entity presents application as official notice that Entity is designating the following equipment at the installation address as machinery.

Description of Machinery:
The Pattyn CE Machine is used for a unique manufacturing process at entity's location above. 3rd Party Evaluation for UL508a, NFPA 79, and NEC 670 Compliance by Muth Power Solutions (Joshua Jay Knighton). Field Evaluation Label (FEB) with unique identifier placed on the machinery. Specific labels for this machine include - (MPS-FEB-060021)

Name of Professional Engineer involved: Joshua Knighton License No.: 16721

Please answer the following questions:

○ Yes ◉ No: The machinery as a packaged unit is available in a listed form.

○ Yes ◉ No: Has an electrical standard been prepared or adopted to which the machinery should conform. (e.g. NRTL or NFPA 79: Electrical Standard for Industrial Machinery)

◉ Yes ○ No: The machinery is specific electrical equipment for use by the applying entity and not a line as manufactured, stored, sold, installed, or attached.

◉ Yes ○ No: A label indicating the installation complies with nationally recognized standards or tests determining suitable usage for said installation in manner utilized has been adhered to machinery by 3rd party conducting field listing.

◉ Yes ○ No: In the opinion of the Entity the machinery complies with NEC 670.

◉ Yes ○ No: Entity accepts responsibility and liability for the machinery.

◉ Yes ○ No: Entity is of the opinion the machinery is safe for the use intended.

By my signature below, I do solemnly swear the statements made herein are true and correct to the best of my knowledge and belief. Completion of this application does not guarantee approval.

Name: Rick Schaff Position: Manager

SIGNATURE DATE: 01/05/2026

To Submit: Mail or fax to the South Dakota Electrical Commission (contact information at the top of this form).

Ensure your application includes:

☑ Signature and Date
☑ Attach Stamped Engineering plans

Field Evaluation of Non-Listed Industrial Machinery
MPS-FEB-060021

PATTYN CE-31 (2025P254)

01/05/2026

OLM Food Solutions
2400 N Marietta Pl, Sioux Falls
Minnehaha County, South Dakota

Revision	Description	Date
0.0	Initial Release - **FAILED**	2026-01-05
1.0	Initial Release - **PASSED**	2026-01-05

Muth Power Solutions

Summary:

PATTYN, CE-31 (2025P254) panel + connected equipment was installed without a recognized listing label. The panel + connected equipment was built solely for **OLM Food Solutions** and will only be used in their production processes. South Dakota's Electrical Commission requires an application to be submitted when there is ***"No Listing on Installation"***. The requirements for the machinery designation & to be approved by the commission and authority having jurisdiction (AHJ) is as follows:

- No Standard has been prepared or adopted
- Owner states machinery is safe for intended us
- The machinery is specific electrical equipment for use by applying entity and not a line as manufactured, stored, sold, installed, or attached
- Comply with Article 670 of NFPA 70
  - Nameplate Information
  - **Provide proof of compliance with NFPA 79 by licensed professional engineer**

The intent of this report is to show the findings of the evaluation by a professional engineer. If anything was discovered to be non-compliant, it'll be listed in the ***Observations Log*** at the end of the report. Any issues discovered that require corrective actions must be corrected before a final report will be sent to the South Dakota Electrical Commission and the Field Evaluation Body (FEB) label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

In compliance with NFPA 791, Muth Power Solutions (M.P.S) generated a unique serial number for the FEB label: **MPS-FEB-060021**. This serial number will be referenced on the machine label as well as in this evaluation report once the machinery is compliant with applicable standards.

Any performance testing is outside the scope and was not performed during this evaluation.

The following versions of codes / standards were used for this evaluation

- NFPA 70 National Electrical Code (2020)
- NFPA 79 Electrical Standard for Industrial Machinery (2024)
- NFPA 790 Competency of Third-Party Field Evaluation Bodies (2024)
- NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment (2024)

Overall Result of Evaluation:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of NFPA 70, Article 670:

Definition of Industrial Machinery [NFPA 70, Article 670.2]

A power-driven machine (or a group of machines working together in a coordinated manner), not portable by hand while working, that is used to process material by cutting; forming; pressure; electrical, thermal, or optical techniques; lamination; or a combination of these processes. It can include associated equipment used to transfer material or tooling, including fixtures, to assemble/disassemble, to inspect or test, or to package [The associated electrical equipment, including the logic controller(s) and associated software/logic together with the machine actuators and sensors, are considered as part of the industrial machine]

- The Pattyn CE-31 is a case erector machine. This machine processes cardboard boxes by receiving a flat piece of carboard. It then forms the box by folding the piece of carboard. It then sends it out to be processed further on the conveyor line. This meets the definition of an industrial machine.

Nameplate Data [NFPA 70, Article 670.3(A)]

The nameplate must be attached to the control equipment enclosure or machine with the following information

- Supply Voltage: **480VAC**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **4.2A**
- Short Circuit Current Rating: **10 KA**
- Largest Motor or Load: **2.7 FLA**
- Electrical Drawing Number: **2025P254 Sheets 1-60**

- A nameplate was observed on the machine that is compliant with NEC 670.

Supply Conductors [NFPA 70, Article 670.4(A)]

The supply conductors must have an ampacity rating not less than

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

- The CE-31 case erector machine is supplied from panel H3 with a 3P/15A 460V circuit with #12 CU conductors. Doing the above calculation, the resulted ampacity of the panel is around **12.34A**. This is compliant with NEC 670 since #12 CU is rated for 25A at 75 Deg C

Conductors				
Load	Full Load Amps	Wire Size/Type	Wire Amp Rating @ 75 Deg C	Overcurrent Trip
U1260 (hot melt)	2.40563	#14	15A	15A
M1201 (carton transport)	0.6	#14	15A	10A
G1220	1	#14	15A	10A
M1202 (box transport reference side)	0.6	#14	15A	10A
M1203 (box transport opposite side)	0.6	#14	15A	10A
M1209 (Vacuum Pump)	2.45	#14	15A	2.5A
Main Supply (Load side of Disconnect)	-	#14	15A	10A

Disconnecting Means [NFPA 70, Article 670.4(B)]

The electrical enclosure must have a disconnecting means since the machine is considered an individual unit. It is not required to have integral overcurrent protection.

- The panel has a single disconnecting means and it is fed from a single 3P/460V circuit breaker. This is compliant with NEC 670.

Overcurrent Protection [NFPA 70, Article 670.4(C)]

The electrical enclosure must have a single feeder circuit breaker or fuses when furnished as part of an industrial machine. The rating of the overcurrent device shall be sized on sum of

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

- The panel is supplied from H3 panelboard with a 15A 3P 460V circuit breaker (Eaton PDG23M0015). The above calculation results in approximately **12A**. Doing **12***1.25, the overcurrent protection results in **15A**. The nearest circuit breaker for this is 15A, so the feeder circuit breaker is compliant with NEC 670.

Heating Loads						
Load	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
U1260 (Hot Melt)						2

Supply Conductor Rating @ 75 Deg C
#12 CU is rated 25A

Largest Motor							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
M1209 (Vacuum Pump)	-	2.45	460	3	0.83	0.9	2.61

Calculated Amps (1.25 (heat + large motor) + Other Loads)
12.34

Other Loads							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
G1220	-	20	24	3	0.9	0.9	1.03
M1202 (box transport reference side)	-	0.631343	460	3	0.71	0.7	1.01
M1203 (box transport opposite side)	-	0.631343	460	3	0.71	0.7	1.01
M1201 (carton transport)	-	0.631343	460	3	0.71	0.7	1.01

Short Circuit Current Rating [NFPA 70, Article 670.5]

The electrical enclosure must not be installed in a location where the maximum available fault current exceeds the nameplate rating.

- The panel is terminated on a non-fused disconnect (Socomec SICROM25), which has a 10 kA SCCR since it isn't protected by J fuses. **<u>This panel should be rated 10 kA SCCR</u>**
  - The downstream Schneider Electric Multi9 BP breakers are rated for 10 kAIC @ 480Y/277V
  - The pass thru terminals are rated for 10 kA
  - The motor contactors and overloads are protected by the breakers and have a series rating of 10 kA
  - The glue melter is rated for 10 kA SCCR
  - The DC components are fed from a DC power supply that limits the fault current from the ac input so the output is limited to 23A max. This is done electronically, so it is okay to rate this power supply at 10 kA AC fault current
  - The fault current was calculated from the utility XFMR down to the CE-31 case erector. An apparent power of 2500 kVA was used since the utility may have to increase the kVA size to handle the full load. With a 5.39% impedance, the maximum fault current at this node is approximately 2,975 A, so the 10 kA SCCR is compliant with NEC 670

FAULT CURRENT CALCULATION

Utility XFMR Rating:	2500 kVA	Transformer Phase:	3	Impedance (%Z):	5.39%	Fault Current (Inf. Bus):	55789.10 A	Utility XFMR Secondary Voltage	480						

Panel or Transformer Name	Feeder Length in Feet "L"	Upstream Available Fault Current "I"	Wire Material	Wire Size	Conduit Type	(Based on Wire and Conduit) "C"	Line-to-Line Voltage "E"	Number of Conductors "n"	$f = \frac{\sqrt{3} \times L \times I}{n \times C \times E}$	$M = \frac{1}{1+f}$	Available Fault Current Isc= M x I	Motor Contribution Isym(mot. cont.)= (Motor Full Load Amps) x 5	Total Available Fault Current Itot=Isc+Isym(mot.cont.)	Transformer KVA	Tra
CT-1	10	55,789	ALUMINUM	750 MCM	NON-MAGNETIC	23491	480	11	0.01	0.99	55358	0	**55358**		
MDP-1	100	55,358	ALUMINUM	750 MCM	NON-MAGNETIC	23491	480	11	0.08	0.93	51386	0	**51386**		
H1	25	51,386	ALUMINUM	250 MCM	STEEL	12122	480	4	0.10	0.91	46902	0	**46902**		
H2	25	51,386	ALUMINUM	250 MCM	STEEL	12122	480	4	0.10	0.91	46902	0	**46902**		
H3	45	51,386	ALUMINUM	250 MCM	STEEL	12122	480	2	0.34	0.74	38229	0	**38229**		
CE-31 Case Erector	106	38,229	COPPER	12 AWG	STEEL	617	480	2	11.85	0.08	2975	0	**2975**		

Surge Protection [NFPA 70, Article 670.6]

The electrical enclosure shall have proper surge protection if the upstream supply circuit does not protect the enclosure

- The CE-31 Case Erector is fed from H3, which is fed from MDP-1. MDP-1 was supplied with appropriate surge protector (240 kA), so this is compliant with NEC 670

NFPA 70, Article 670 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of UL508A:

Part 2 Enclosures
The enclosure shall have the proper rating for the environment it is installed in. It shall be constructed to support the weight within as well as the environmental forces such as wind & snow. It shall have appropriate markings to indicate manufacturer's intent.

Part 2 Industrial Machinery
Shall comply with NFPA 79 and other standards listed in sections 65 to 67

UL508A Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Construction Requirements of NFPA 79:

System must comply with sections 4 – 17 of NFPA 79. Some of the higher priority requirements are summarized below that are accompanied with onsite pictures of the actual gear. Other specific sections/requirements will be called out as needed, if it's applicable to the equipment being evaluated.

Electrical Supply
The system shall be able to operate within 90%-110% of voltage rating, 99%-101% frequency rating, and harmonic THD of 0%-10% for short periods of time.

- The supply circuit is 480V/3ph 60 Hz. It was measured to be within the tolerances listed in NFPA 79, so the supply circuit is compliant

Environmental
The system shall be protected from the environment it is installed within.

- The system is installed in an enclosure rated for the environment (stainless steel)

Available Fault Current

The system shall have a larger withstand short circuit rating than the maximum available fault current on the line terminals of the system's disconnecting means.

- See NEC 670 section above that shows compliance with NFPA 79

Disconnecting Means

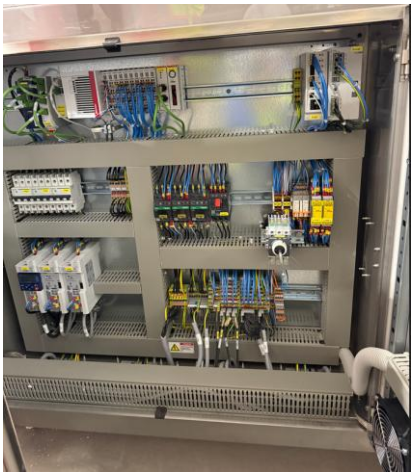
The system shall have a single disconnecting means from the single supply circuit wherever possible. The line side must be protected from unintentional direct contact by users when the enclosure door is opened. A disconnecting means is not required for circuits less than 50VAC RMS or 60VDC.

- See NEC 670 section above that shows compliance with NFPA 79

Protection from Electrical Hazards

The system shall have live parts insulated from users and openings/windows must meet UL requirements. It must have integral fault protection for accidental connections to live parts. Any interlocked electrical supply circuits must be indicated on the enclosure with a warning placard. An arc flash hazard warning placard must be placed on the enclosures with live electrical present.

- The enclosure has integral fault protection for each circuit on the machine. There are not exposed parts, and the electrical supply is not interlocked. There are appropriate warning placards on the machine.



Protection of Equipment

The system may have some of the following protection in order to protect the equipment

- Overcurrent
- Overloads for motors
- Ground fault
- Overvoltage
- Abnormal temperature
- Incorrect phases or loss of phases
- Overspeed of machines

- Overcurrent
  - The circuits are protected with circuit breakers that are appropriate for the FLA

- Overloads/Motor circuit protector
  - The motor has an overload/mcp that's appropriate for the FLA (2.4A) and overload is 2.5 to 4A & set around 2.5-2.6A

Grounding & Bonding

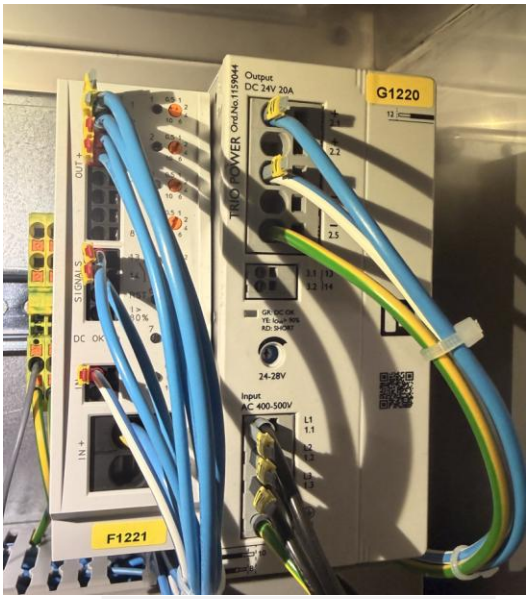
The system shall be installed in accordance with NFPA 70, Article 250 for grounding & bonding. The equipment grounding conductor must be identified with the word “GROUND” or be identified with the GND symbol.

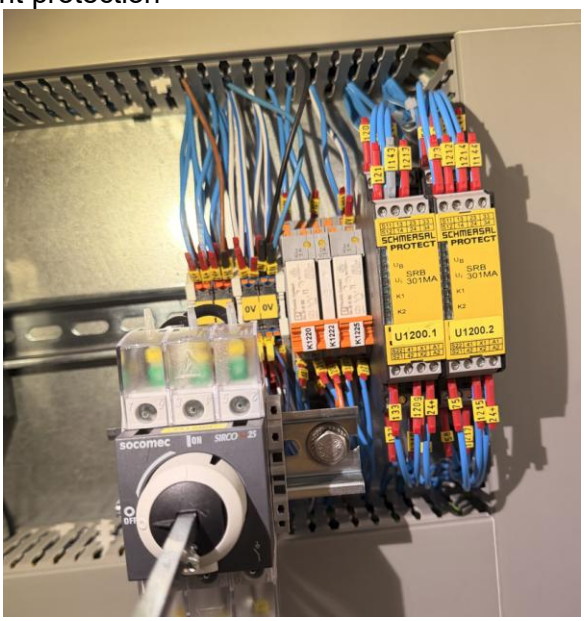
- It was observed that the ground points have appropriate ground symbols at bond points

Control Circuits & Control Functions

The AC control circuit must come from a control transformer must not exceed 120VAC & maximum 1kA available fault current. Any DC control circuit must be less than 250 VDC. All control circuits must have overcurrent protection. All safety/start/stop functions must work as intended. Interlocks shall be in place to ensure machine fails safely. Emergency stops shall keep the machinery de-energized until safety conditions are reset (shouldn’t restart, but act as a permissive to the machinery).

- The safety circuits were tested and were fully working/functioning as intended. The E-stop circuits are all supplied from a 24VDC control circuit (Phoenix Contact 1159044 24VDC/20A Power Supply)
    - This power supply has integral protection for overvoltage, short circuit proof, surge, etc and it has appropriate overcurrent protection





Protection against overvoltage at the output (OVP)	≤ 35 V DC
Short-circuit-proof	yes
No-load proof	yes
Protective circuit	Transient protection; Varistor

Operator Interface and Control Devices

The operator interface must be readily accessible to the machine. Control devices must be mounted securely / installed in compliance with the manufacturer and they must be protected from accidental operation / false signal to the machine. Color indicators shall be the following colors for each function:

- **Start or Normal Conditions** (Green but Black, White, or Gray)
- **Stop** (Red but Black, White, or Gray is permitted for non-emergencies)
- **Emergency Stop or Emergency Conditions** (Red)
    - Must be RED with Mushroom-head Type & yellow background for pushbutton-operated switches. Pull-cord operated switches are also valid.
- **Abnormal Conditions** (Yellow or Amber)
- **Push-Button that Causes Movement** (Black, but White, Gray, Blue is permitted)
- **Push-Button for Resets** (Blue, but Black, White, Gray, and RED if stop/emergency reset)
- **Mandatory Conditions** (Blue)
- **Neutral Conditions** (White)

- The operator buttons are installed in compliance with NFPA 79; blue for reset, red for stop, green for start, & Estop is yellow/red with twisting to engage

Control Equipment: Location, Mounting, and Enclosures

All enclosures must be mounted so it allows maintenance, protection against environmental influences, and allows normal operation of the machinery. Exposed, live electrical terminations must be protected. Mechanical tubing, piping, valves, etc to handle gas, liquid, or air must not be located within the enclosure. Electrical working spaces defined in NFPA 70, Article 110 shall be followed for the enclosure and its doors.

- The machine is installed in a professional manner & allows proper operation. The installation is compliant with NFPA 79

Conductors, Cables, and Flexible Cords

All cabling/conductors shall be identified and installed in accordance with their intended use. Conductors must be copper with appropriate insulation and ampacity rating not less than 125% of the full load current

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

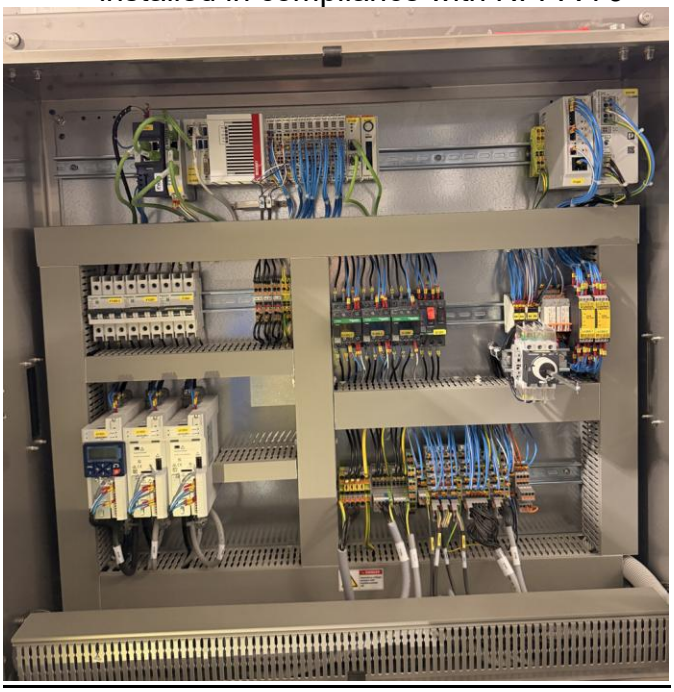
The ampacity rating must take into account deration factors such as more than three current-carrying conductors in raceway, temperature, buried, etc. The wire's insulation shall be rated for all voltage levels present within the raceway.

- The conductors were all observed to be appropriate sizes for their respective FLA and they're compliant with NPFA 79

Wiring Practices

All connections must be installed so it prevents accidental loosening. Terminals must be rated for the wire and labeled clearly. In no instance shall the wire cross over the terminals for panel/field wiring. Wires shall be run from source to destination without splices or joints within the enclosure. If an enclosure is supplied from more than one power source, the power wiring must be run in separate raceways for each disconnecting means. Exposed cables are permitted along machinery supports, but care should be taken to ensure the cabling doesn't inhibit maintenance (machine guards, grease ports, gauges, etc). Cabling must be supported adequately so sagging or damage doesn't occur. Cables subjected to damage must be protected and installed in compliance with NFPA 70. Grounding conductors must be identified by color green with or without yellow stripes.

- The wire was installed in a professional manner, and in no instance were any wires loose, had exposed conductors on the termination, crossed over things, etc. The wire/raceway was installed in compliance with NFPA 79

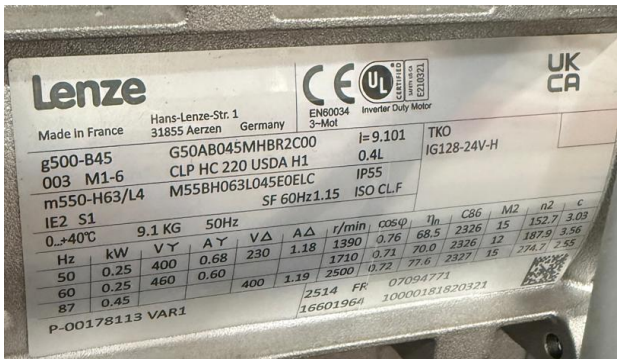


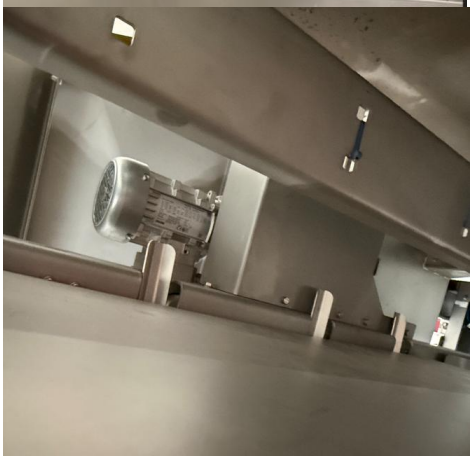
Electric Motors and Associated Equipment

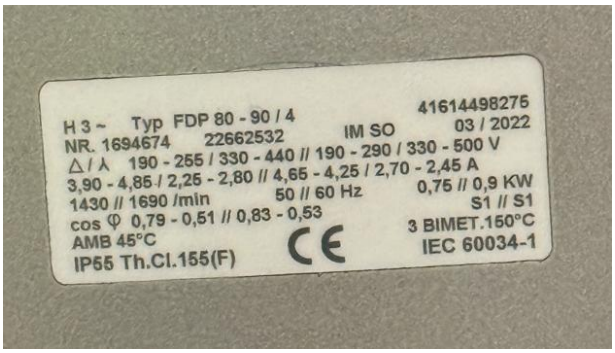
All motors shall be mounted so they are adequately protected from damage, accessible for maintenance, have proper cooling, and can be easily replaced. Motors shall be selected to match the connected process

conditions. Motors must have nameplate data marked in compliance with NFPA 70, Article 430, and they must have appropriate motor controllers and protection.

- The motor's nameplate is compliant with NFPA 79 & it is installed in a professional manner







Receptacles and Lighting

Receptacles for machinery must be GFCI-protected, supplied from grounded 120V source, have proper overcurrent protection, and be rated to withstand the environment it is installed in. Only lighting systems designed for use greater than 150V may be permitted; otherwise, lighting systems should be 120V for machinery. Lighting must have overcurrent protection, must not exceed 15 Amps, and must be rated for the physical environment.

- There were not any receptacles or lighting supplied from the machine's 480V control panel, so this is not applicable

Marking and Safety Signs

The equipment must be marked with supplier's name, trademark, and identifying symbol. Safety placards and markings must be permanent.

- Warning Label – *Potential Electric Shock and Arc Flash Hazard*
  - Place visibly on Enclosure when Voltage is greater than 50VAC or 60VDC
    - The machine has appropriate safety placards

- Nameplate
  - Required by manufacturer
    - Name of Supplier
    - Model, Serial Number, etc
    - Rated voltage, phase, frequency, and full-load current for each supply
    - Largest Motor or Load
    - Max Protective Device Threshold
    - Short Circuit Current Rating

- Electrical Diagram Number(s) or Drawing Index

- See NEC 670 section above for nameplate information

Technical Documentation
The machinery must have necessary information present for installation, operation, maintenance, and storage of the machine. This can be in the form of drawings, diagrams, charts, tables, etc. It must be stored onsite with the machine.

- It was observed that proper technical documentation was stored onsite with the machine

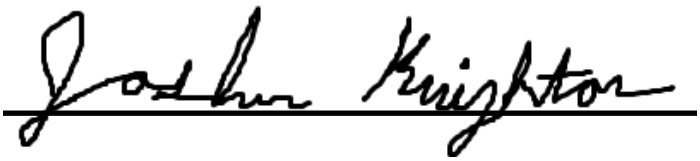
NFPA 79 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

I hereby certify that I am a professional engineer, registered in the State of South Dakota and I do not benefit financially by the sale/manufacturing of the equipment evaluated within this report, I did not impose excessive financial preconditions to evaluate the equipment, and there were not any conflicts of interests in performing the evaluation. I attest that the evaluation and report was performed by me personally and is to the best of my knowledge complete and accurate.



January 5, 2026

Date:

Joshua J. Knighton
Professional Engineer

Observation Log:

During the evaluation, differences between the observed installation and the governing standards are logged here with recommended actions to correct the issue (if required).

Any issue discovered that requires corrected actions must be corrected and re-evaluated before a final report will be sent to the Electrical Commission and the FEB label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

Observation Log			
Non-Compliance Issue No.	**Standard/Code Reference**	**Issue**	**Corrective Action Required**
1	NFPA 79	The the ground bonds do not have the sticker symbol	**YES** – Place ground symbol stickers at every bond point **Corrected same day evaluation 01/05/2026**

SOUTH DAKOTA DEPARTMENT OF LABOR AND REGULATION

SOUTH DAKOTA ELECTRICAL COMMISSION

217 West Missouri Avenue, Pierre, SD 57501
Tel: 605.773.3573 Toll-Free: 1.800.233.7765 Fax: 605.773.6213 dlr.sd.gov/electrical

MACHINERY DESIGNATION APPLICATION

Entity Name: OLM Food Solutions Contact Person: Brady Welu

Tel: (877) 841 – 1431

Address: 2930 W Maple St (STREET) Sioux Falls (CITY) SD (STATE) 57107 (ZIP)

Installation Address: : 2400 N Marietta Pl (STREET) Sioux Falls (CITY) SD (ZIP)

☉ Yes ○ No: Entity presents application as official notice that Entity is designating the following equipment at the installation address as machinery.

Description of Machinery:
The Pattyn Flexim Machine is used for a unique manufacturing process at entity's location above. 3rd Party Evaluation for UL508a, NFPA 79, and NEC 670 Compliance by Muth Power Solutions (Joshua Jay Knighton). Field Evaluation Label (FEB) with unique identifier placed on the machinery. Specific labels for this machine include - (MPS-FEB-060019)

Name of Professional Engineer involved: Joshua Knighton License No.: 16721

Please answer the following questions:

○ Yes ◉ No: The machinery as a packaged unit is available in a listed form.

○ Yes ◉ No: Has an electrical standard been prepared or adopted to which the machinery should conform. (e.g. NRTL or NFPA 79: Electrical Standard for Industrial Machinery)

◉ Yes ○ No: The machinery is specific electrical equipment for use by the applying entity and not a line as manufactured, stored, sold, installed, or attached.

◉ Yes ○ No: A label indicating the installation complies with nationally recognized standards or tests determining suitable usage for said installation in manner utilized has been adhered to machinery by 3rd party conducting field listing.

◉ Yes ○ No: In the opinion of the Entity the machinery complies with NEC 670.

◉ Yes ○ No: Entity accepts responsibility and liability for the machinery.

◉ Yes ○ No: Entity is of the opinion the machinery is safe for the use intended.

By my signature below, I do solemnly swear the statements made herein are true and correct to the best of my knowledge and belief. Completion of this application does not guarantee approval.

Name: Rick Schaff Position: Manager

SIGNATURE DATE: 01/05/2026

To Submit: Mail or fax to the South Dakota Electrical Commission (contact information at the top of this form).

Ensure your application includes:

☑ Signature and Date
☑ Attach Stamped Engineering plans

Field Evaluation of Non-Listed Industrial Machinery
MPS-FEB-060019

PATTYN FLEXIM-41 2025P255

01/05/2026

OLM Food Solutions
2400 N Marietta Pl, Sioux Falls
Minnehaha County, South Dakota

Revision	Description	Date
0.0	Initial Release - FAILED	2026-01-05
1.0	Initial Release - **PASSED**	2026-01-05

Muth Power Solutions

Summary:

PATTYN, FLEXIM-41 2025P255 panel + connected equipment was installed without a recognized listing label. The panel + connected equipment was built solely for **OLM Food Solutions** and will only be used in their production processes. South Dakota's Electrical Commission requires an application to be submitted when there is ***"No Listing on Installation"***. The requirements for the machinery designation & to be approved by the commission and authority having jurisdiction (AHJ) is as follows:

- No Standard has been prepared or adopted
- Owner states machinery is safe for intended us
- The machinery is specific electrical equipment for use by applying entity and not a line as manufactured, stored, sold, installed, or attached
- Comply with Article 670 of NFPA 70
  - Nameplate Information
  - **Provide proof of compliance with NFPA 79 by licensed professional engineer**

The intent of this report is to show the findings of the evaluation by a professional engineer. If anything was discovered to be non-compliant, it'll be listed in the ***Observations Log*** at the end of the report. Any issues discovered that require corrective actions must be corrected before a final report will be sent to the South Dakota Electrical Commission and the Field Evaluation Body (FEB) label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

In compliance with NFPA 791, Muth Power Solutions (M.P.S) generated a unique serial number for the FEB label: **MPS-FEB-060019**. This serial number will be referenced on the machine label as well as in this evaluation report once the machinery is compliant with applicable standards.

Any performance testing is outside the scope and was not performed during this evaluation.

The following versions of codes / standards were used for this evaluation

- NFPA 70 National Electrical Code (2020)
- NFPA 79 Electrical Standard for Industrial Machinery (2024)
- NFPA 790 Competency of Third-Party Field Evaluation Bodies (2024)
- NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment (2024)

Overall Result of Evaluation:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of NFPA 70, Article 670:

Definition of Industrial Machinery [NFPA 70, Article 670.2]

A power-driven machine (or a group of machines working together in a coordinated manner), not portable by hand while working, that is used to process material by cutting; forming; pressure; electrical, thermal, or optical techniques; lamination; or a combination of these processes. It can include associated equipment used to transfer material or tooling, including fixtures, to assemble/disassemble, to inspect or test, or to package [The associated electrical equipment, including the logic controller(s) and associated software/logic together with the machine actuators and sensors, are considered as part of the industrial machine]

- The Flexim 41 machine automatically inserts bags into boxes and uses a knife to cut the bags to length before sending the bagged boxes down the line on a conveyor. This meets the definition of an industrial machine

Nameplate Data [NFPA 70, Article 670.3(A)]

The nameplate must be attached to the control equipment enclosure or machine with the following information

- Supply Voltage: **480VAC**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **5.4 FLA**
- Short Circuit Current Rating: **10 KA**
- Largest Motor or Load: **3.4 FLA**
- Electrical Drawing Number: **2025P255 Sheets 1-113**

- A nameplate was observed on the machine that is compliant with NEC 670

Supply Conductors [NFPA 70, Article 670.4(A)]

The supply conductors must have an ampacity rating not less than

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

- The flexim 41 bag inserter machine is supplied from panel H3 with a 3P/15A 460V circuit with #12 CU conductors. Doing the above calculation, the resulted ampacity of the panel is around **10A.** This is compliant with NEC 670 since #12 CU is rated for 25A at 75 Deg C

Heating Loads						
Load	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]

Supply Conductor Rating @ 75 Deg C
#12 CU is rated 25A

Largest Motor							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
M0701	-	0.6	460	3	0.85	0.9	0.62

Calculated Amps (1.25 (heat + large motor) + Other Loads)
10.25

Other Loads							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
G0720	-	20	24	1	1	1	0.48
G0723.1	-	1.7	460	3	0.77	0.9	1.95
G0723.2	-	1.7	460	3	0.77	0.9	1.95
T0730	-	-	-	-	-	-	3.00

Disconnecting Means [NFPA 70, Article 670.4(B)]

The electrical enclosure must have a disconnecting means since the machine is considered an individual unit. It is not required to have integral overcurrent protection.

- The panel has single disconnecting means & is compliant with NEC 670

Overcurrent Protection [NFPA 70, Article 670.4(C)]

The electrical enclosure must have a single feeder circuit breaker or fuses when furnished as part of an industrial machine. The rating of the overcurrent device shall be sized on sum of

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

- The panel is supplied from H3 panelboard with a 15A 3P 460V circuit breaker (Eaton PDG23M0015). The above calculation results in approximately 10.25A. Doing 10.25*1.25, the overcurrent protection results in 12.8A. The nearest circuit breaker for this is 15A, so the feeder circuit breaker is compliant with NEC 670.

Short Circuit Current Rating [NFPA 70, Article 670.5]

The electrical enclosure must not be installed in a location where the maximum available fault current exceeds the nameplate rating.

- The panel is terminated on a non-fused disconnect (Socomec SICROM25), which has a 10 kA SCCR since it isn't protected by J fuses. **This panel should be rated 10 kA SCCR**
  - The downstream Schneider Electric Multi9 BP breakers are rated for 10 kAIC @ 480Y/277V
  - The pass thru terminals are rated for 10 kA
  - The motor contactors and overloads are protected by the breakers and have a series rating of 10 kA
  - The DC components are fed from a DC power supply that limits the fault current from the ac input so the output is limited to 23A max. This is done electronically, so it is okay to rate this power supply at 10 kA AC fault current

- The fault current was calculated from the utility XFMR down to the Flexim 41 bag inserter. An apparent power of 2500 kVA was used since the utility may have to increase the kVA size to handle the full load. With a 5.39% impedance, the maximum fault current at this node is approximately 3,259 A, so the 10 kA SCCR is compliant with NEC 670

FAULT CURRENT CALCULATION

Utility XFMR Rating:	2500 kVA	Transformer Phase:	3	Impedance (%Z):	5.39%	Fault Current (Inf. Bus):	55789.10 A	Utility XFMR Secondary Voltage	480					

Panel or Transformer Name	Feeder Length in Feet "L"	Upstream Available Fault Current "I"	Wire Material	Wire Size	Conduit Type	(Based on Wire and Conduit) "C"	Line-to-Line Voltage "E"	Number of Conductors "n"	$f = \frac{\sqrt{3} \times L \times I}{n \times C \times E}$	$M = \frac{1}{1+f}$	Available Fault Current Isc= M x I	Motor Contribution Isym(mot. cont.)= (Motor Full Load Amps) x 5	Total Available Fault Current Itot=Isc+Isym(mot.cont.)	Transformer KVA
CT-1	10	55,789	ALUMINUM	750 MCM	NON-MAGNETIC	23491	480	11	0.01	0.99	55358	0	**55358**	
MDP-1	100	55,358	ALUMINUM	750 MCM	NON-MAGNETIC	23491	480	11	0.08	0.93	51386	0	**51386**	
H1	25	51,386	ALUMINUM	250 MCM	STEEL	12122	480	4	0.10	0.91	46902	0	**46902**	
H2	25	51,386	ALUMINUM	250 MCM	STEEL	12122	480	4	0.10	0.91	46902	0	**46902**	
H3	45	51,386	ALUMINUM	250 MCM	STEEL	12122	480	2	0.34	0.74	38229	0	**38229**	
FLEXIM 41 BAG INSERTER	96	38,229	COPPER	12 AWG	STEEL	617	480	2	10.73	0.09	3259	0	**3259**	

Surge Protection [NFPA 70, Article 670.6]
The electrical enclosure shall have proper surge protection if the upstream supply circuit does not protect the enclosure

- The Flexim 41 bag inserter is fed from H3, which is fed from MDP-1. MDP-1 was supplied with appropriate surge protector (240 kA), so this is compliant with NEC 670

NFPA 70, Article 670 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Applicable Construction Requirements of UL508A:

Part 2 Enclosures
The enclosure shall have the proper rating for the environment it is installed in. It shall be constructed to support the weight within as well as the environmental forces such as wind & snow. It shall have appropriate markings to indicate manufacturer's intent.

Part 2 Industrial Machinery
Shall comply with NFPA 79 and other standards listed in sections 65 to 67

UL508A Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Construction Requirements of NFPA 79:

System must comply with sections 4 – 17 of NFPA 79. Some of the higher priority requirements are summarized below that are accompanied with onsite pictures of the actual gear. Other specific sections/requirements will be called out as needed, if it's applicable to the equipment being evaluated.

Electrical Supply

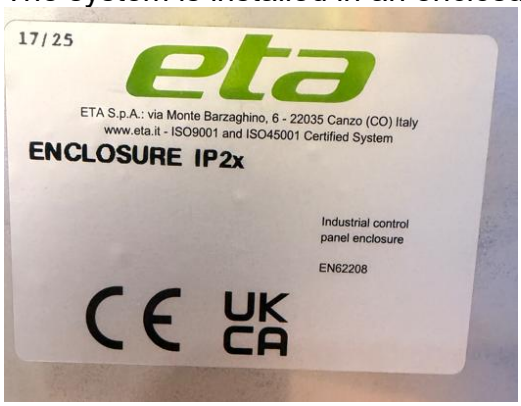
The system shall be able to operate within 90%-110% of voltage rating, 99%-101% frequency rating, and harmonic THD of 0%-10% for short periods of time.

- The supply circuit is 480V/3ph 60 Hz. It was measured to be within the tolerances listed in NFPA 79, so the supply circuit is compliant

Environmental

The system shall be protected from the environment it is installed within.

- The system is installed in an enclosure rated for the environment (stainless steel)



Available Fault Current

The system shall have a larger withstand short circuit rating than the maximum available fault current on the line terminals of the system's disconnecting means.

- See NEC 670 section above that shows compliance with NFPA 79

Disconnecting Means

The system shall have a single disconnecting means from the single supply circuit wherever possible. The line side must be protected from unintentional direct contact by users when the enclosure door is opened. A disconnecting means is not required for circuits less than 50VAC RMS or 60VDC.

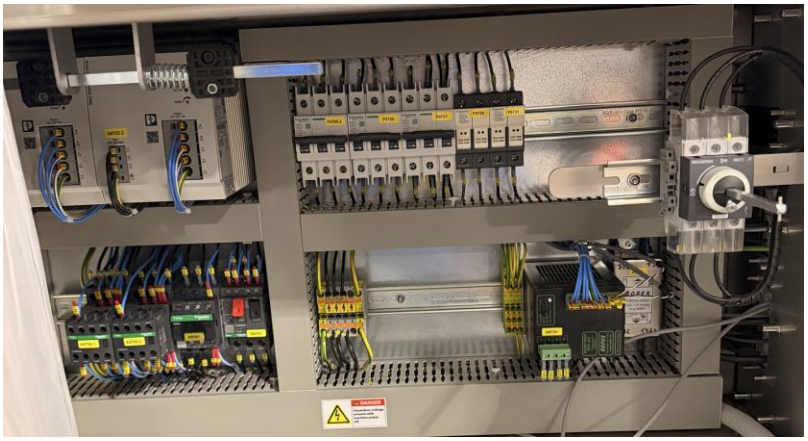
- See NEC 670 section above that shows compliance with NFPA 79

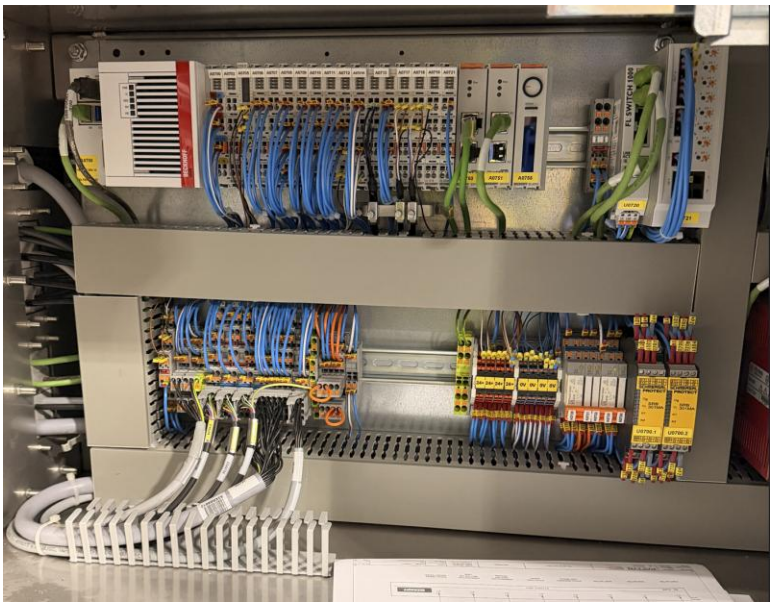
Protection from Electrical Hazards

The system shall have live parts insulated from users and openings/windows must meet UL requirements. It must have integral fault protection for accidental connections to live parts. Any interlocked electrical supply

circuits must be indicated on the enclosure with a warning placard. An arc flash hazard warning placard must be placed on the enclosures with live electrical present.

- The enclosure has integral fault protection for each circuit on the machine. There are not exposed parts, and the electrical supply is not interlocked. There are appropriate warning placards on the machine.





Protection of Equipment

The system may have some of the following protection in order to protect the equipment

- Overcurrent

- Overloads for motors
- Ground fault
- Overvoltage
- Abnormal temperature
- Incorrect phases or loss of phases
- Overspeed of machines

  - Overcurrent
    - The circuits are protected with circuit breakers that are appropriate for the FLA

  - Overloads/Motor circuit protector
    - The motor has an overload/mcp that's appropriate for the FLA (0.6A) and overload is 0.4 to 0.63A

- Ground fault
- Overvoltage
- Abnormal temperature
- Incorrect phases or loss of phases

Grounding & Bonding

The system shall be installed in accordance with NFPA 70, Article 250 for grounding & bonding. The equipment grounding conductor must be identified with the word “GROUND” or be identified with the GND symbol.

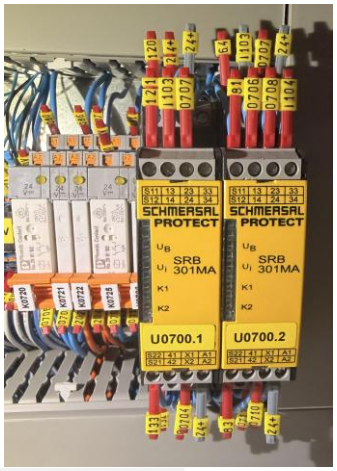
- The panels are grounded appropriately with the supply conductors & field circuits
- The panels have appropriate ground symbols at each bond point

Control Circuits & Control Functions

The AC control circuit must come from a control transformer must not exceed 120VAC & maximum 1kA available fault current. Any DC control circuit must be less than 250 VDC. All control circuits must have overcurrent protection. All safety/start/stop functions must work as intended. Interlocks shall be in place to

ensure machine fails safely. Emergency stops shall keep the machinery de-energized until safety conditions are reset (shouldn't restart, but act as a permissive to the machinery).

- The safety circuits were tested and were fully working/functioning as intended. The E-stop circuits are all supplied from a 24VDC control circuit (Phoenix Contact 1159044 24VDC/20A Power Supply)
  - This power supply has integral protection for overvoltage, short circuit proof, surge, etc and it has appropriate overcurrent protection



Protection against overvoltage at the output (OVP)	≤ 35 V DC
Short-circuit-proof	yes
No-load proof	yes
Protective circuit	Transient protection; Varistor

Operator Interface and Control Devices

The operator interface must be readily accessible to the machine. Control devices must be mounted securely / installed in compliance with the manufacturer and they must be protected from accidental operation / false signal to the machine. Color indicators shall be the following colors for each function:

- **Start or Normal Conditions** (Green but Black, White, or Gray)
- **Stop** (Red but Black, White, or Gray is permitted for non-emergencies)
- **Emergency Stop or Emergency Conditions** (Red)
  - Must be RED with Mushroom-head Type & yellow background for pushbutton-operated switches. Pull-cord operated switches are also valid.
- **Abnormal Conditions** (Yellow or Amber)
- **Push-Button that Causes Movement** (Black, but White, Gray, Blue is permitted)
- **Push-Button for Resets** (Blue, but Black, White, Gray, and RED if stop/emergency reset)
- **Mandatory Conditions** (Blue)
- **Neutral Conditions** (White)

  - The panel has compliant control/interface devices

- Blue PB : resets the system
- Green PB : starts the system
- Red PB : stops the system
- Estop : stops the panel for emergency conditions & requires a twisting motion to engage, so it prevents accidental operation

Control Equipment: Location, Mounting, and Enclosures

All enclosures must be mounted so it allows maintenance, protection against environmental influences, and allows normal operation of the machinery. Exposed, live electrical terminations must be protected. Mechanical tubing, piping, valves, etc to handle gas, liquid, or air must not be located within the enclosure. Electrical working spaces defined in NFPA 70, Article 110 shall be followed for the enclosure and its doors.

- The machine + connected cables / hoses / tubing is installed in compliant with NPFA 79. There's a protective door that goes up / down to prevent an operator from coming in contact with the process. The picture below shows it in its up position.

Conductors, Cables, and Flexible Cords

All cabling/conductors shall be identified and installed in accordance with their intended use. Conductors must be copper with appropriate insulation and ampacity rating not less than 125% of the full load current

$$1.25 * (Heating\ Loads\ [Amps] + Largest\ Motor\ FLA\ [Amps]) + Other\ Motors\ \&\ Loads\ [Amps]$$

The ampacity rating must take into account deration factors such as more than three current-carrying conductors in raceway, temperature, buried, etc. The wire's insulation shall be rated for all voltage levels present within the raceway.

- The conductors were all observed to be appropriate sizes for their respective FLA and they're compliant with NPFA 79

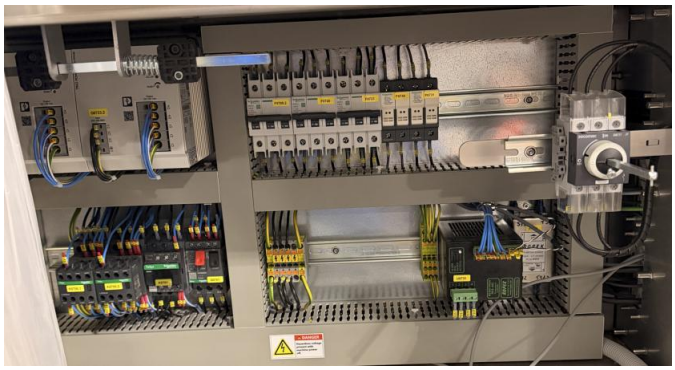
Conductors				
Load	Full Load Amps	Wire Size/Type	Wire Amp Rating @ 75 Deg C	Overcurrent Trip
G0720	1	#14	15A	10A
G0723.1	3	#14	15A	10A
G0723.2	3	#14	15A	10A
T0730 (primary of xfmr)	4.166667	#14	15A	10A
T0730 (secondary of xfmr)	5	#14	15A	10A
M0701	0.6	#14	15A	0.63
Main Supply (Load side of Disconnect)	10.25	#14	15A	15A

Wiring Practices

All connections must be installed so it prevents accidental loosening. Terminals must be rated for the wire and labeled clearly. In no instance shall the wire cross over the terminals for panel/field wiring. Wires shall be run from source to destination without splices or joints within the enclosure. If an enclosure is supplied from more than one power source, the power wiring must be run in separate raceways for each disconnecting means. Exposed cables are permitted along machinery supports, but care should be taken to ensure the cabling doesn't inhibit maintenance (machine guards, grease ports, gauges, etc). Cabling must be supported

adequately so sagging or damage doesn't occur. Cables subjected to damage must be protected and installed in compliance with NFPA 70. Grounding conductors must be identified by color green with or without yellow stripes.

- The wire was installed in a professional manner, and in no instance were any wires loose, had exposed conductors on the termination, crossed over things, etc. The wire/raceway was installed in compliance with NFPA 79



Electric Motors and Associated Equipment

All motors shall be mounted so they are adequately protected from damage, accessible for maintenance, have proper cooling, and can be easily replaced. Motors shall be selected to match the connected process conditions. Motors must have nameplate data marked in compliance with NFPA 70, Article 430, and they must have appropriate motor controllers and protection.

- The motor's nameplates are compliant with NFPA 79 & they are installed in a professional manner

Receptacles and Lighting

Receptacles for machinery must be GFCI-protected, supplied from grounded 120V source, have proper overcurrent protection, and be rated to withstand the environment it is installed in. Only lighting systems designed for use greater than 150V may be permitted; otherwise, lighting systems should be 120V for

machinery. Lighting must have overcurrent protection, must not exceed 15 Amps, and must be rated for the physical environment.

- There were not any receptacles or lighting supplied from the machine's 480V control panel, so this is not applicable

Marking and Safety Signs

The equipment must be marked with supplier's name, trademark, and identifying symbol. Safety placards and markings must be permanent.

- Warning Label – *Potential Electric Shock and Arc Flash Hazard*
  - Place visibly on Enclosure when Voltage is greater than 50VAC or 60VDC
    - The machine has appropriate safety placards

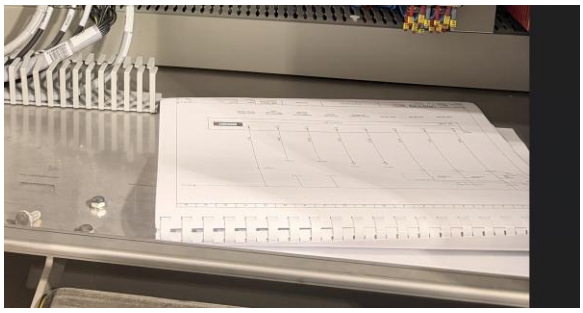
- Nameplate
  - Required by manufacturer
    - Name of Supplier
    - Model, Serial Number, etc
    - Rated voltage, phase, frequency, and full-load current for each supply
    - Largest Motor or Load
    - Max Protective Device Threshold
    - Short Circuit Current Rating
    - Electrical Diagram Number(s) or Drawing Index

  - See NEC 670 section above for nameplate information

Technical Documentation

The machinery must have necessary information present for installation, operation, maintenance, and storage of the machine. This can be in the form of drawings, diagrams, charts, tables, etc. It must be stored onsite with the machine.

- Technical documentation/drawings was observed within the machine



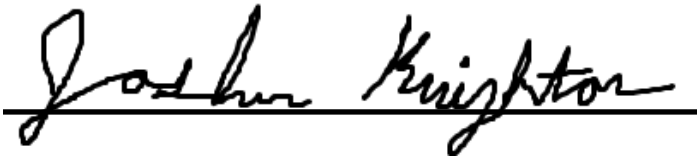
NFPA 79 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

I hereby certify that I am a professional engineer, registered in the State of South Dakota and I do not benefit financially by the sale/manufacturing of the equipment evaluated within this report, I did not impose excessive financial preconditions to evaluate the equipment, and there were not any conflicts of interests in performing the evaluation. I attest that the evaluation and report was performed by me personally and is to the best of my knowledge complete and accurate.



January 5, 2026

Date:

Joshua J. Knighton
Professional Engineer

Observation Log:

During the evaluation, differences between the observed installation and the governing standards are logged here with recommended actions to correct the issue (if required).

Any issue discovered that requires corrected actions must be corrected and re-evaluated before a final report will be sent to the Electrical Commission and the FEB label placed on the equipment showing compliance with UL standards, NFPA 79, and NFPA 70 Article 670.

Observation Log			
Non-Compliance Issue No.	**Standard/Code Reference**	**Issue**	**Corrective Action Required**
1	NFPA 79	The enclosure's doors are not bonded & the ground bonds do not have the sticker symbol	**YES** – bond the enclosure's doors. Place ground symbol stickers at every bond point **Corrected same day evaluation 01/05/2026**