Proposed Meeting Agenda
SOUTH DAKOTA ELECTRICAL COMMISSION
via Microsoft Teams
Meeting ID: 294 806 091 650| Passcode: QY9yC9Mj
or Call +1 605-679-7263 ID 179 755 73

Wednesday, April 30, 2025, at 1:00 p.m. CDT

A. Call to Order
B. Consent Agenda
    i. Approval of Agenda
    ii. Approval of January 8 Minutes
C. Public Comment
D. Public Hearing on Proposed Rule Changes
E. Third Party Inspector Applications
F. Machinery Designation Applications
    a. H20319DA-B00-060001
    b. H20319DA-B00-060002
    c. H20319DA-B00-060003
G. Subcommittee Reports
    i. Fee Structure
    ii. Hutterite Colonies/501(d) Licenses
    iii. Surge Protection
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 — July 10, 2025
M. Adjournment

Meeting Minutes
SOUTH DAKOTA ELECTRICAL COMMISSION
Microsoft Teams Meeting
January 8, 2025, 9:00 a.m. CST

Tor Sorlien called the meeting to order at 9:01 a.m. A quorum was present.

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

Members Absent: Rick Cronin, Stephen Burgess

Others Present: Pamela Overweg, Program Director, Jerry McCabe, Division Director, Jodi Aumer, Director of Professional Licensing, Brent Schoulte, Lead Inspector SDEC, Kelsey Henson, Program Assistant, Jennifer Doubledee, Attorney, Billy Schneider, Muth Electric, Jeff Kirstein, IEC Dakotas, Jeff Sveen, Attorney, Teddi Mueller, Sioux Empire HBA, Kim Swift, Dakota Electric

Dave Eide made a motion to approve the consent agenda. Carl Odde seconded the motion. **MOTION PASSED**.

Tor Sorlien asked for public comment. Billy Schneider spoke in opposition of the fee increase bill. Jeff Kirstein spoke in opposition of the fee increase bill. Jeff Sveen asked to be a part of the Hutterite Colony Wiring Process discussion. Teddi Mueller spoke in opposition of the fee increase bill. Kim Swift spoke in opposition of the fee increase bill.

Director Overweg presented the board with information on the fee increase bill. The board discussed. Dave Eide made a motion to approve the proposed bill. Bob Jarding seconded the motion. **MOTION PASSED**.

Carl Odde made a motion to form a subcommittee to discuss a change to the fee structure for the future. Bob Jarding seconded the motion. **MOTION PASSED.**

Director Overweg provided an overview of information in the packet regarding surge protection. Brent Schoulte presented the board with information on the 2023 NEC Surge Protection Requirements. The board discussed. Dave Eide made a motion to form a sub committee to study surge protection requirements. Doug Fuerst seconded the motion. **MOTION PASSED.**

Director Overweg presented the board with Machinery Designation Applications and supporting documentation. The board discussed. Dave Eide made a motion to accept the engineer's inspection of the safety of the equipment in the packet. Doug Fuerst seconded the motion. **MOTION PASSED**.

Director Overweg presented the board with information on the 501(d) license and the Hutterite Colony wiring permit process. The board discussed. Jeff Sveen was asked to provide the commission with a list of Hutterite residents that hold an electrical contractor or class b electrician license. Carl Odde made a motion to form a subcommittee to discuss the 501(d) license. Bob Jarding seconded the motion. **MOTION PASSED**.

Director Overweg presented the board with information on South Dakota Electrical Council membership and renewals. The board discussed. Doug Fuerst made a motion to only pay for

the board members who wish to renew their member with the South Dakota electrical council. Bob Jarding seconded the motion. **MOTION PASSED**.

Tor Sorlien did not have anything to report as president.

Brent Schoulte updated the commission on the open position in Aberdeen and the inspectors working to get caught up with the current staff available in our budget.

Director Overweg updated the commission on the billing reconciliation completion, the RFI (Request for Information) for a new database, and the Aberdeen inspector position.

The next commission meeting was tentatively scheduled for April 10, 2025.

Bob Jarding made a motion to adjourn the commission meeting. Doug Fuerst seconded the motion. **MOTION PASSED**. The meeting adjourned at 11:04 a.m.

20:44:18:01. (Effective through June 30, 2025) Wiring permit required. The following require a wiring permit:

(1) Any electrical service entrance. A single wiring permit may be used for a temporary electrical service and a new service on a single project when both are installed by the same contractor, which must be stated on the wiring permit at the start of the project. Separate wiring permits are required if more than one contractor is involved; and

(2) Electrical wiring being performed under an owner's exemption.

Any other electrical installation with a calculated inspection fee of ten dollars or greater requires a wiring permit and minimum electrical inspection fee of no less than one hundred dollars or a specific fee as provided by chapter 20:44:20, unless a wiring permit is not required under the provisions of article 20:44 and SDCL chapter 36-16.

20:44:18:01. (Effective July 1, 2025) Wiring permit required. The following require a wiring permit:

(1) Any electrical service entrance. A single wiring permit may be used for a temporary electrical service and a new service on a single project when both are installed by the same contractor, which must be stated on the wiring permit at the start of the project. Separate wiring permits are required if more than one contractor is involved; and

(2) Electrical wiring being performed under an owner's exemption.

Any other electrical installation with a calculated inspection fee of ~~ten~~ thirty dollars or greater requires a wiring permit and minimum electrical inspection fee of no less than ~~one hundred~~ one hundred fifty dollars or a specific fee as provided by chapter 20:44:20, unless a wiring permit is not required under the provisions of article 20:44 and SDCL chapter 36-16.

Source: SL 1975, ch 16, § 1; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 13 SDR 75, 13 SDR 95, effective January 1, 1987; 20 SDR 92, January 1, 1994; 20 SDR 222, effective July 6,

1994; transferred from § 20:44:04:01, August 12, 1994; 32 SDR 37, effective September 1, 2005; 37 SDR 236, effective June 29, 2011; 51 SDR54, effective November 12, 2024.

General Authority: SDCL 36-16-12.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:18:02. (Effective through June 30, 2025) Obtaining a wiring permit. Wiring permits may be obtained for $15 each from the commission office.

An owner who is wiring in compliance with SDCL 36-16-15 may obtain wiring permits from the commission office or from state electrical inspectors for $15 each.

Wiring permits are valid for three years from the date the permit is issued. Electrical installations that extend beyond three years from that date must have new wiring permits posted and sent to the commission office before the expiration of the three-year limit. Failure to date the wiring permit at the start of the job constitutes a late wiring permit procedure and subjects the installer to a $100 administrative fee. Failure to renew the permit on electrical installations that are not completed constitutes a late wiring permit procedure which subjects the installer to a $100 administrative fee.

20:44:18:02. (Effective July 1, 2025) Obtaining a wiring permit. Wiring permits may be obtained for ~~$15~~ twenty dollars each from the commission office.

An owner who is wiring in compliance with SDCL 36-16-15 may obtain wiring permits from the commission office ~~or from state electrical inspectors~~ for ~~$15~~ twenty dollars each.

Wiring permits are valid for three years from the date the permit is issued. Electrical installations that extend beyond three years from that date must have new wiring permits posted and sent to the commission office before the expiration of the three-year limit. Failure to date the wiring permit at the start of the job constitutes a late wiring permit procedure and subjects the installer to a ~~$100~~ two hundred fifty dollar administrative fee. Failure to renew the permit on electrical installations that are not completed constitutes a late wiring permit procedure which subjects the installer to a ~~$100~~ two hundred fifty dollar administrative fee.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:04:02, August 12, 1994; 28 SDR 178, effective July 1, 2002; 32 SDR 37,

effective September 1, 2005; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-27, 36-16-30.

Law Implemented: SDCL 36-16-28, 36-16-30.

20:44:18:03. (Effective through June 30, 2025) Wiring permit procedure. All electrical installations, including new installations and additional work on old installations, covered by § 20:44:18:01 and SDCL chapter 36-16, must have electrical wiring permits executed by the electrical contractor, Class B electrician, or owner doing electrical wiring on a residence or farmstead in compliance with SDCL 36-16-15. The commission shall provide the permit. A permit consists of five forms. The procedure for executing a wiring permit is as follows:

(1) Within 15 calendar days after starting an electrical installation which is subject to inspection, the installer shall send the white copy to the office of the commission. Not sending in the white copy within 15 calendar days after the electrical work has started is a late wiring permit procedure and the installer is subject to a $100 administrative fee;

(2) The hard copy shall be posted by the installer on the job site near the service entrance disconnect switch location when the electrical installation is started. The installer shall securely attach the peel-off sticker, located below the permit number on the hard copy, to the outside portion of the permanent building service. Failure to post this form and sticker is a late wiring permit procedure and subjects the installer to a $250 administrative fee;

(3) The installer shall retain the blue copy;

(4) The installer must send the yellow and green copies to the supplier of power to the installation to have the installation energized. The power supplier shall retain the yellow copy. The power supplier shall send all green copies of active wiring permits in its possession to the commission office once each month.

Electrical contractors or Class B electricians holding current licenses may secure electrical wiring permits only from the commission office.

An owner doing electrical wiring on a residence or farmstead in compliance with SDCL 36-16-15 and 36-16-13.1 must secure wiring permits from the commission office, the power supplier, or a state electrical inspector. Electrical contractors, Class B electricians, or owners doing electrical

work on their own residence or farmstead in compliance with SDCL 36-16-15 may not allow their wiring permit to be used by any other person.

20:44:18:03. (Effective July 1, 2025) Wiring permit procedure. All electrical installations, including new installations and additional work on old installations, covered by § 20:44:18:01 and SDCL chapter 36-16, must have electrical wiring permits executed by the electrical contractor, Class B electrician, or owner doing electrical wiring on a residence or farmstead in compliance with SDCL 36-16-15. The commission shall provide the permit. A permit consists of five forms. The procedure for executing a wiring permit is as follows:

(1) Within 15 calendar days after starting an electrical installation which is subject to inspection, the installer shall send the white copy to the office of the commission. Not sending in the white copy within ~~15~~ fifteen calendar days after the electrical work has started is a late wiring permit procedure and the installer is subject to a ~~$100~~ two hundred fifty dollar administrative fee;

(2) The hard copy shall be posted by the installer on the job site near the service entrance disconnect switch location when the electrical installation is started. The installer shall securely attach the peel-off sticker, located below the permit number on the hard copy, to the outside portion of the permanent building service. Failure to post this form and sticker is a late wiring permit procedure and subjects the installer to a ~~$250~~ two hundred fifty dollar administrative fee;

(3) The installer shall retain the blue copy;

(4) The installer must send the yellow and green copies to the supplier of power to the installation to have the installation energized. The power supplier shall retain the yellow copy. The power supplier shall send all green copies of active wiring permits in its possession to the commission office once each month.

Electrical contractors or Class B electricians holding current licenses may secure electrical wiring permits only from the commission office.

An owner doing electrical wiring on a residence or farmstead in compliance with SDCL 36-16-15 and 36-16-13.1 must secure wiring permits from the commission office, the power supplier, or a state electrical inspector. Electrical contractors, Class B electricians, or owners doing electrical work on their own residence or farmstead in compliance with SDCL 36-16-15 may not allow their wiring permit to be used by any other person.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 10 SDR 131, effective June 3, 1984; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 13 SDR 75, 13 SDR 95, effective January 1, 1987; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:04:03, August 12, 1994; 35 SDR 305, effective July 1, 2009.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-28, 36-16-30.

Cross-Reference: Inspection fees, ch 20:44:20.

CHAPTER 20:44:20

INSPECTION FEES

Section

20:44:20:01. (Effective through June 30, 2025) Inspection fees for new residential electrical installations. Inspection fees for all new single-family residential electrical services are based on service equipment ampere capacity as follows:

(1) 0 through 200 amperes: $160, and includes one rough-in inspection;

(2) 201 through 400 amperes: $300, and includes two rough-in inspections; and

(3) 401 amperes and over: $300 plus circuits, and includes two rough-in inspections.

In addition to the rough-in inspections set forth in this section, each installation under this section includes one final inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

20:44:20:01. (Effective July 1, 2025) Inspection fees for new residential electrical installations. Inspection fees for all new single-family residential electrical services are based on service equipment ampere capacity as follows:

(1) 0 through 200 amperes: ~~$160~~ two hundred eight dollars, and includes one rough-in inspection;

(2) 201 through 400 amperes: ~~$300~~, three hundred ninety dollars, and includes two rough-in inspections; and

(3) 401 amperes and over ~~$300~~ three hundred ninety dollars plus circuits, and includes two rough-in inspections.

In addition to the rough-in inspections set forth in this section, each installation under this section includes one final inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 7 SDR 90, effective April 1, 1981; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20

SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:01, August 12, 1994; 32 SDR 37, effective September 1, 2005; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-30.

20:44:20:02. (Effective through June 30, 2025) Inspection fees and rough-in inspections for service connections on other electrical installations. Inspection fees for electrical service connections and associated rough-in inspections are as follows:

(1) On new installations, including new service installations on commercial installations and new service installations not covered in this chapter, and based on service equipment ampere capacity:

(a) 0 through 200 amperes: sixty dollars plus circuits, and includes one rough-in inspection;

(b) 201 through 400 amperes: seventy-five dollars plus circuits, and includes one rough-in inspection;

(c) 401 through 800 amperes: one hundred dollars plus circuits, and includes one rough-in inspection;

(d) 801 through 1600 amperes: one hundred fifty dollars plus circuits, and includes one rough-in inspection;

(e) 1601 amperes and over: two hundred seventy-five plus circuits, and includes two rough-in inspections; and

(2) On existing installations, including replacement service installations for existing homes, commercial installations, and installations not covered in this chapter, and based on service equipment ampere capacity:

(a) 0 through 200 amperes: one hundred dollars plus new circuits;

(b) 201 through 400 amperes: one hundred twenty-five dollars plus new circuits;

(c) 401 through 800 amperes: one hundred fifty dollars plus new circuits;

(d) 801 through 1600 amperes: one hundred seventy-five dollars plus new circuits; and

(e) 1601 amperes and over: two hundred dollars plus new circuits.

Fees for remodeling single family residences may not exceed the flat rate fee for comparable new single family residential electrical services in § 20:44:20:01. A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

In addition to the rough-in inspections set forth in this section, each installation under this section includes one final inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

20:44:20:02. (Effective July 1, 2025) Inspection fees and rough-in inspections for service connections on other electrical installations. Inspection fees for electrical service connections and associated rough-in inspections are as follows:

(1) On new installations, including new service installations on commercial installations and new service installations not covered in this chapter, and based on service equipment ampere capacity:

(a) 0 through 200 amperes: ~~sixty~~ seventy-eight dollars plus circuits, and includes one rough-in inspection;

(b) 201 through 400 amperes: ~~seventy-five~~ ninety-eight dollars plus circuits, and includes one rough-in inspection;

(c) 401 through 800 amperes: ~~one hundred~~ one hundred thirty dollars plus circuits, and includes one rough-in inspection;

(d) 801 through 1600 amperes: ~~one hundred fifty~~ one hundred ninety-five dollars plus circuits, and includes one rough-in inspection;

(e) 1601 amperes and over: ~~two hundred seventy-five~~ three hundred fifty-eight plus circuits, and includes two rough-in inspections; and

(2) On existing installations, including replacement service installations for existing homes, commercial installations, and installations not covered in this chapter, and based on service equipment ampere capacity:

(a) 0 through 200 amperes: ~~one hundred~~ one hundred thirty dollars plus new circuits;

(b) 201 through 400 amperes: ~~one hundred twenty-five~~ one hundred sixty-three dollars plus new circuits;

(c) 401 through 800 amperes: ~~one hundred fifty~~ one hundred ninety-five dollars plus new circuits;

(d) 801 through 1600 amperes: ~~one hundred seventy-five~~ two hundred twenty-eight dollars plus new circuits; and

(e) 1601 amperes and over: ~~two hundred~~ two hundred sixty dollars plus new circuits.

Fees for remodeling single family residences may not exceed the flat rate fee for comparable new single family residential electrical services in § 20:44:20:01. A minimum fee of ~~one hundred~~ one hundred fifty dollars must be imposed if the total fee calculated under this section is less than ~~one hundred~~ one hundred fifty dollars.

In addition to the rough-in inspections set forth in this section, each installation under this section includes one final inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 7 SDR 90, effective April 1, 1981; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:02, August 12, 1994; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020; 51 SDR 54, effective November 12, 2024.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:02.01. (Effective through June 30, 2025) Plus circuits. Plus circuits fees are charged for each single circuit in a cabinet or panel, not counting spares and spaces, as follows:

(1) 0 to 30 amperes, inclusive: $5;

(2) 31 to 60 amperes, inclusive: $10;

(3) 61 to 100 amperes, inclusive: $12; and

(4) Each additional 100 amperes or larger circuit: $8.

20:44:20:02.01. (Effective July 1, 2025) ~~Plus~~ Fees charged for circuits. ~~Plus circuits fees~~ Fees are charged for each single circuit in a cabinet or panel, not counting spares and spaces, as follows:

(1) 0 to 30 amperes, inclusive: ~~$5;~~ seven dollars;

(2) 31 to 60 amperes, inclusive: ~~$10;~~ thirteen dollars;

(3) 61 to 100 amperes, inclusive: ~~$12; and~~ fifteen dollars; and

(4) Each additional 100 amperes or larger circuit: ~~$8.~~ ten dollars.

Source: 37 SDR 236, effective June 29, 2011.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-30.

20:44:20:03. (Effective through June 30, 2025) Inspection fee for circuit installations or alterations. The inspection fee for circuit installations or alterations, including commercial installations, new installations in existing homes, and other installations not covered by this chapter, is fifty dollars per circuit.

Any fee calculated in this section may not exceed the calculated fee for a new installation of the same type in §§ 20:44:20:01 and 20:44:20:02. A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars. A one- or two-circuit installation or alteration includes one inspection. An installation or alteration of three or more circuits includes two inspections. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

20:44:20:03. (Effective July 1, 2025) Inspection fee for circuit installations or alterations. The inspection fee for circuit installations or alterations, including commercial installations, new installations in existing homes, and other installations not covered by this chapter, is ~~fifty~~ sixty-five dollars per circuit.

Any fee calculated in this section may not exceed the calculated fee for a new installation of the same type in §§ 20:44:20:01 and 20:44:20:02. A minimum fee of ~~one hundred~~ one hundred fifty dollars must be imposed if the total fee calculated under this section is less than ~~one hundred~~ one hundred fifty dollars. A one- or two-circuit installation or alteration includes one inspection. An installation or alteration of three or more circuits includes two inspections. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 7 SDR 90, effective April 1, 1981; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from

§ 20:44:06:03, August 12, 1994; 32 SDR 37, effective September 1, 2005; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020; 51 SDR 54, effective November 12, 2024.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:04. (Effective through June 30, 2025) Inspection fees for electrical installations associated with remodeling projects. When neither the service nor the branch circuits are altered, inspection fees associated with a remodeling project are as follows:

(1) First forty openings or connections: two dollars each;

(2) Each additional opening or connection: fifty cents;

(3) First forty lighting fixtures: two dollars each;

(4) Each additional lighting fixture: fifty cents; and

(5) Each motor or other special equipment: six dollars.

A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars. Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

20:44:20:04. (Effective July 1, 2025) Inspection fees for electrical installations associated with remodeling projects. When neither the service nor the branch circuits are altered, inspection fees associated with a remodeling project are as follows:

(1) First forty openings or connections: ~~two dollars~~ three dollars each;

(2) Each additional opening or connection: ~~fifty cents;~~ one dollar;

(3) First 40 lighting fixtures: ~~two dollars~~ three dollars each;

(4) Each additional lighting fixture: ~~fifty cents;~~ one dollar; and

(5) Each motor or other special equipment: ~~six dollars.~~ eight dollars.

A minimum fee ~~of one hundred~~ one hundred fifty dollars must be imposed if the total fee calculated under this section is less than ~~one hundred~~ one hundred fifty dollars. Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 2 SDR 89, effective July 2, 1976; 7 SDR 90, effective April 1, 1981; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:04, August 12, 1994; 46 SDR 128, effective May 26, 2020; 51 SDR 54, effective November 12, 2024.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:05. (Effective through June 30, 2025) Inspection fees for electrical installations in apartment buildings. The inspection fee for an apartment building is fifty dollars per unit.

If each apartment is served individually, the service is included in the flat rate fee. All other service entrances are subject to § 20:44:20:02 and all other circuits and feeders are subject to § 20:44:20:02.01. A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

Each permit for an apartment building includes one rough-in inspection per 4 units and one final inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

20:44:20:05. (Effective July 1, 2025) Inspection fees for electrical installations in apartment buildings. The inspection fee for an apartment building is ~~fifty~~ one hundred fifty dollars per unit.

If each apartment is served individually, the service is included in the flat rate fee. All other service entrances are subject to § 20:44:20:02 and all other circuits and feeders are subject to § 20:44:20:02.01. ~~A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.~~

Each permit for an apartment building includes one rough-in inspection per ~~4~~ four units and one final inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 7 SDR 90, effective April 1, 1981; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:05, August 12, 1994; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020; 51 SDR 54, effective November 11, 2024.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:06. (Effective through June 30, 2025) Inspection fees for electrical installations serving outdoor signs and area lighting. The inspection fee for outdoor sign feeders or branch circuits and for area lighting is calculated as follows:

(1) For each outdoor sign feeder or branch circuit, the greater of (a) or (b):

(a) Fifty dollars; or

(b) The fee calculated in accordance with §§ 20:44:20:02 and 20:44:20:02.01, with a maximum of sixty dollars; and

(2) For area lighting used to illuminate large outdoor spaces, the fee calculated in accordance with §§ 20:44:20:02 and 20:44:20:02.01, with a maximum of sixty dollars for each light fixture.

A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

20:44:20:06. (Effective July 1, 2025) Inspection fees for electrical installations serving outdoor signs and area lighting. ~~The inspection fee for outdoor sign feeders or branch circuits and for area lighting is calculated as follows:~~

~~(1) For each outdoor sign feeder or branch circuit, the greater of (a) or (b):~~

~~(a) Fifty dollars; or~~

~~(b) The fee calculated in accordance with §§ 20:44:20:02 and 20:44:20:02.01, with a maximum of sixty dollars; and~~

~~(2) For area lighting used to illuminate large outdoor spaces, the fee calculated in accordance with §§ 20:44:20:02 and 20:44:20:02.01, with a maximum of sixty dollars for each light fixture.~~

~~A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.~~

~~Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10~~ Repealed.

Source: SL 1975, ch 16, § 1; 2 SDR 89, effective July 2, 1976; 7 SDR 90, effective April 1, 1981; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 16 SDR 153, effective March 29, 1990; 18 SDR 83, effective November 10, 1991; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:06, August 12, 1994; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020; 51 SDR 54, effective November 12, 2024.

~~**General Authority:** SDCL 36-16-12, 36-16-30.~~

~~**Law Implemented:** SDCL 36-16-27, 36-16-29, 36-16-30.~~

20:44:20:07. (Effective through June 30, 2025) Inspection fees for electrical installations serving field irrigation systems. Inspection fees for electrical installations serving field irrigation systems are as follows:

(1) The inspection fee for an irrigation system, which includes one irrigation machine, either pipe or pivot, that is supplied by one main or booster pump and one electrical service, is seventy-five dollars plus two dollars for each motor, except for the motor driving the pivot;

(2) The inspection fee for a pumping station is computed in accordance with §§ 20:44:20:02 and 20:44:20:02.01;

(3) The inspection fee for a diesel-driven water pump, at which the diesel also drives an electric generator for power and controls, is computed in accordance with § 20:44:20:10;

(4) The inspection fee for an addition to or replacement of an electrically driven pivot on an existing system is computed in accordance with § 20:44:20:10; and

(5) The inspection fee for a range well must be charged as a requested inspection according to § 20:44:20:10 and billed for each inspection hour or fraction of an hour.

A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

20:44:20:07. (Effective July 1, 2025) Inspection fees for electrical installations serving field irrigation systems. ~~Inspection fees for electrical installations serving field irrigation systems are as follows:~~

~~(1) The inspection fee for an irrigation system, which includes one irrigation machine, either pipe or pivot, that is supplied by one main or booster pump and one electrical service, is seventy-five dollars plus two dollars for each motor, except for the motor driving the pivot;~~

~~(2) The inspection fee for a pumping station is computed in accordance with §§ 20:44:20:02 and 20:44:20:02.01;~~

~~(3) The inspection fee for a diesel-driven water pump, at which the diesel also drives an electric generator for power and controls, is computed in accordance with § 20:44:20:10;~~

~~(4) The inspection fee for an addition to or replacement of an electrically driven pivot on an existing system is computed in accordance with § 20:44:20:10; and~~

~~(5) The inspection fee for a range well must be charged as a requested inspection according to § 20:44:20:10 and billed for each inspection hour or fraction of an hour.~~

~~A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.~~

~~Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10~~ Repealed.

Source: SL 1975, ch 16, § 1; 2 SDR 89, effective July 2, 1976; 7 SDR 90, effective April 1, 1981; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:07, August 12, 1994; 32 SDR 37, effective September 1, 2005; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020; 51 SDR 54, effective November 12, 2024.

~~**General Authority:** SDCL 36-16-12, 36-16-30.~~

~~**Law Implemented:** SDCL 36-16-27, 36-16-29, 36-16-30.~~

20:44:20:08. (Effective through June 30, 2025) Inspection fees for mobile home services and feeders. The inspection fee for services to each mobile home service or feeder, whether on or off a mobile home court, is as follows:

(1) First unit: seventy-five dollars; and

(2) Each additional unit: thirty-five dollars.

One wiring permit may apply to an entire mobile home court if the number of lots included is specified on the wiring permit before it is sent to the commission office.

A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a final inspection may be assessed fees under § 20:44:20:10.

20:44:20:08. (Effective July 1, 2025) Inspection fees for mobile home services and feeders. The inspection fee for services to each mobile home service or feeder, whether on or off a mobile home court, is as follows:

(1) First unit: ~~seventy-five~~ one hundred dollars; and

(2) Each additional unit: ~~thirty-five~~ forty-five dollars.

One wiring permit may apply to an entire mobile home court if the number of lots included is specified on the wiring permit before it is sent to the commission office.

A minimum fee of ~~one hundred~~ one hundred fifty dollars must be imposed if the total fee calculated under this section is less than ~~one hundred~~ one hundred fifty dollars.

Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 7 SDR 90, effective April 1, 1981; 10 SDR 131, effective June 3, 1984; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:08, August 12, 1994; 32 SDR 37, effective September 1, 2005; 46 SDR 128, effective May 26, 2020; 51 SDR 54, effective November 12, 2024.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:09. (Effective through June 30, 2025) Inspection fees for electrical installations at recreational vehicle parks. The inspection fee is twenty dollars for each recreational vehicle park unit pedestal. A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars. Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for an inspection may be assessed fees under § 20:44:20:10.

The service to the recreational vehicle park itself is computed under § 20:44:20:02.

20:44:20:09. (Effective July 1, 2025) Inspection fees for electrical installations at recreational vehicle parks. The inspection fee is ~~twenty~~ twenty-five dollars for each recreational vehicle park unit pedestal. A minimum fee of ~~one hundred~~ one hundred fifty dollars must be imposed if the total fee calculated under this section is less than ~~one hundred~~ one hundred fifty dollars. Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for an inspection may be assessed fees under § 20:44:20:10.

The service to the recreational vehicle park itself is computed under § 20:44:20:02.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 7 SDR 90, effective April 1, 1981; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 16 SDR 153, effective March 29, 1990; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:09, August 12, 1994; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020; 51 SDR 54, effective November 12, 2024.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:10. (Effective through June 30, 2025) Minimum fee for requested electrical inspections or for reinspections. A minimum inspection fee of one hundred dollars for each inspection man-hour or fraction of a man-hour is charged for any requested electrical inspections or any reinspections to address corrections detailed in a report for a rough-in or final inspection. After the first hour, the fee for each additional fifteen minutes is twenty-five dollars. Inspector time is rounded up to the nearest fifteen-minute increment.

20:44:20:10. (Effective July 1, 2025) Minimum fee for requested electrical inspections or for reinspections. A minimum inspection fee of ~~one hundred~~ one hundred fifty dollars for each inspection man-hour or fraction of a man-hour is charged for any requested electrical inspections or any reinspections to address corrections detailed in a report for a rough-in or final inspection. After the first hour, the fee for each additional fifteen minutes is ~~twenty-five dollars.~~ thirty-seven dollars and fifty cents. Inspector time is rounded up to the nearest fifteen-minute increment.

Source: SL 1975, ch 16, § 1; 2 SDR 89, effective July 2, 1976; 7 SDR 90, effective April 1, 1981; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:10, August 12, 1994; 32 SDR 37, effective September 1, 2005; 43 SDR 181, effective July 10, 2017; 46 SDR 128, effective May 26, 2020; 51 SDR 54, effective November 12, 2024.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:12. (Effective through June 30, 2025) Fee for late corrections. If the corrections listed on an inspector's report are not completed within the specified time, the inspector shall issue a correction order and assess a $100 administrative fee. The inspector shall also assess a reinspection fee calculated according to § 20:44:20:10.

20:44:20:12. (Effective July 1, 2025) Fee for late corrections. If the corrections listed on an inspector's report are not completed within the specified time, the inspector shall issue a correction order and assess a ~~$100~~ two hundred fifty dollar administrative fee. The inspector shall also assess a reinspection fee calculated according to § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 10 SDR 131, effective June 3, 1984; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:12, August 12, 1994.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-30.

Cross-Reference: Inspection for bonding of swimming pools, § 20:44:22:21.

20:44:20:13. (Effective through June 30, 2025) Inspection fees for electrical installations serving swimming pools. Inspection fees for electrical installations serving swimming pools are as follows:

(1) Residential pools: $150; and

(2) All other pools: as computed under § 20:44:20:10.

Each permit under subdivision (1) includes one rough-in inspection and one final inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

20:44:20:13. (Effective July 1, 2025) Inspection fees for electrical installations serving swimming pools. ~~Inspection fees for electrical installations serving swimming pools are as follows:~~

~~(1) Residential pools: $150; and~~

~~(2) All other pools: as computed under § 20:44:20:10.~~

~~Each permit under subdivision (1) includes one rough-in inspection and one final inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10~~ Repealed.

Source: 7 SDR 90, effective April 1, 1981; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:13, August 12, 1994; 46 SDR 128, effective May 26, 2020.

~~**General Authority:** SDCL 36-16-12, 36-16-30.~~

~~**Law Implemented:** SDCL 36-16-30.~~

20:44:23:04. (Effective through June 30, 2025) Inspection fees for modular homes and modular structures. The fees for inspection of modular homes and modular structures conducted under subdivisions 20:44:23:03(1), (3), and (4) are as required by §§ 20:44:20:01, 20:44:20:02, 20:44:20:02.01, and 20:44:20:03. The manufacturer must pay $100 a day for each inspector, plus travel and living expenses, for inspections conducted pursuant to subdivision 20:44:23:03(2).

20:44:23:04. (Effective July 1, 2025) Inspection fees for modular homes and modular structures. The fees for inspection of modular homes and modular structures conducted under subdivisions 20:44:23:03(1), (3), and (4) are as required by §§ 20:44:20:01, 20:44:20:02, 20:44:20:02.01, and 20:44:20:03. The manufacturer must pay ~~$100~~ two hundred ten dollars a day for each inspector, plus travel and living expenses, for inspections conducted pursuant to subdivision 20:44:23:03(2).

Source: SL 1975, ch 16, § 1; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 14 SDR 76, effective November 30, 1987; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:08:05, August 12, 1994; 37 SDR 236, effective June 29, 2011.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-12, 36-16-30.

CHAPTER 20:44:24

CARNIVALS AND SEASONAL DWELLINGS

Section

20:44:24:05. (Effective through June 30, 2025) Minimum inspection fee. Inspection fees for carnivals or celebrations are charged to the owners and concessionaires in accordance with the following schedule:

(1) Ten dollars for each ride or concession, or for a single concession generator or transformer;

(2) Five dollars for reinspection of each unit, if required; and

(3) Thirty dollars for inspection of transformers or generators.

A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

20:44:24:05. (Effective July 1, 2025) Minimum inspection fee. Inspection fees for carnivals or celebrations are charged to the owners and concessionaires in accordance with the ~~following schedule:~~

~~(1) Ten dollars for each ride or concession, or for a single concession generator or transformer;~~

~~(2) Five dollars for reinspection of each unit, if required; and~~

~~(3) Thirty dollars for inspection of transformers or generators.~~

~~A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars~~ fees set forth in chapter 20:44:20. The inspection fees must be paid to the commission by the carnival owner or celebration sponsor prior to or at the time of inspection.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:09:05, August 12, 1994; 43 SDR 181, effective July 10, 2017; 46 SDR 128, effective May 26, 2020; 51 SDR 54, effective November 12, 2024.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:24:06. (Effective through June 30, 2025) Fee to be paid to commission. Fees required by § 20:44:24:05 shall be paid by the carnival owner or celebration sponsor to the commission prior to or at the time of inspection. The inspector shall sign, date, and apply a sticker for each ride, concession, or booth.

20:44:24:06. (Effective July 1, 2025) Fee to be paid to commission. ~~Fees required by § 20:44:24:05 shall be paid by the carnival owner or celebration sponsor to the commission prior to or at the time of inspection. The inspector shall sign, date, and apply a sticker for each ride, concession, or booth~~ Repealed.

Source: SL 1975, ch 16, § 1; 10 SDR 131, effective June 3, 1984; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:09:06, August 12, 1994; 43 SDR 181, effective July 10, 2017.

~~**General Authority:** SDCL 36-16-12, 36-16-30.~~

~~**Law Implemented:** SDCL 36-16-30.~~

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 Corporation Contact Person: Dan Elsasser

Tel: (605) 453 – 1183

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

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

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

Description of Machinery:
It is used for a unique manufacturing process at entity's location above. Industrial Machinery: Hapman H20319DA-B00 with KMC GLOBAL CONTROLS & AUTOMATION control panels.
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 October 2024.

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

Please answer the following questions:

[ ]Yes [X]No: The machinery as a packaged unit is available in a listed form.

[ ]Yes [X]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)

[X]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.

[X]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.

[X]Yes [ ]No: In the opinion of the Entity the machinery complies with NEC 670.

[X]Yes [ ]No: Entity accepts responsibility and liability for the machinery.

[X]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: Dan Elsasser Position: Manufacturing Engineering Manager

SIGNATURE 02 / 05 / 2025 DATE

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

Ensure your application includes:

[X] Signature and Date
[X] Attach Stamped Engineering plans

Muth Power Solutions

Field Evaluated

Equipment MFGR: KMC Global, Hapman

Industrial Machinery: H20319DA-B00

Field Label No.: MPS-FEB-060001

To Verify Label, Call (605)-996-3983

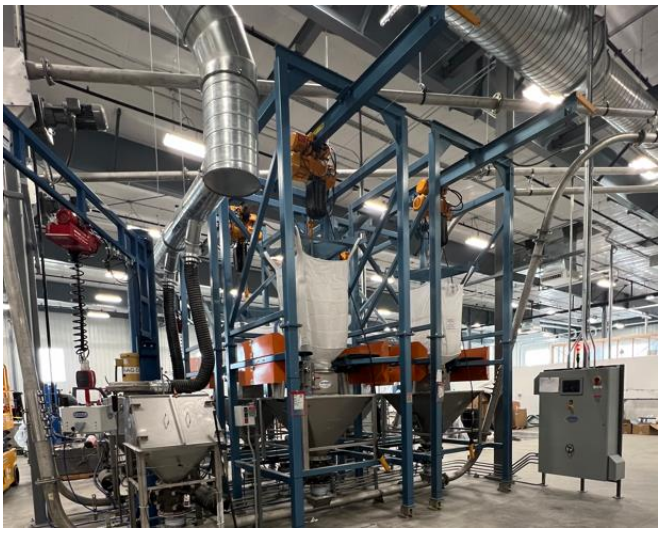
Industrial Machinery Field Evaluated to UL Standards, NFPA 79 and NFPA 70 Article 670. A Report Supplements this Label and Details the Evaluation

Evaluation Date: 10/10/2024

REGISTERED PROFESSIONAL ENGINEER
NUMBER 16721
JOSHUA JAY
KNIGHTON
SOUTH DAKOTA
10/25/24

Field Evaluation of Non-Listed Industrial Machinery
MPS-FEB-060001

Industrial Machinery: H20319DA-B00
Control Panels by: KMC GLOBAL CONTROLS & AUTOMATION
Industrial Machinery by: Hapman



Henkel
600 E Willow St
Minnehaha County, South Dakota

Revision	Description	Date
1.0	Initial Release	10/25/2024

Muth Power Solutions

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

Summary:

H20319DA-B00-1 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 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-060001**. 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)

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

Applicable Construction Requirements of NFPA 70, Article 670:

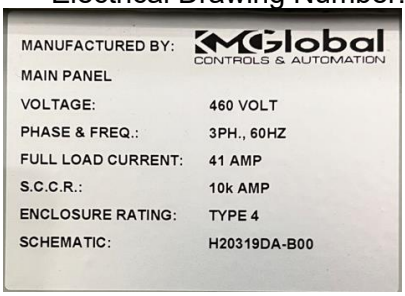
Definition of Industrial Machinery [NFPA 70, Article 670.2]

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: **480 VOLT**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **41 Amps**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **5 HP**
- Electrical Drawing Number: **H20319DA-B00**



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 result of the summation equation above puts the FLA at approximately 41-43 Amps & 125% of that is 51.25A-53.75A. The supply conductors are #2 AWG Copper and are rated for 115A @ 75 Deg C.

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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

Largest Motor							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Conveyor Motor (Top of Bin)	5	7.85	460	3	0.8	0.886	8.82

Other Loads							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
BBU Rotary Valve #1	1	2.04	460	3	0.7	0.95	2.44
BBU Rotary Valve #2	1	2.04	460	3	0.7	0.95	2.44
Dump Rotary Valve	1	2.04	460	3	0.7	0.95	2.44
Bulk Bag Vibrator Motor #1	-	0.16	460	3	0.88	0.9	0.16
Bulk Bag Vibrator Motor #2	-	0.16	460	3	0.88	0.9	0.16
Dump Station Vibrator Motor	-	0.16	460	3	0.88	0.9	0.16
Trolley/Hoist Motor #1	2.4	4.5	460	3	0.88	0.9	4.53
Trolley/Hoist Motor #2	2.4	4.5	460	3	0.88	0.9	4.53
Enclosure 120V Loads	-	0	0	0	0	0	0.50
Dust Collector	2	3.4	460	3	0.88	0.9	3.42
Chain Hammer Motor #1	0.3	0.73	460	3	0.88	0.9	0.73
Chain Hammer Motor #2	0.3	0.73	460	3	0.88	0.9	0.73
Chain Hammer Motor #3	0.3	0.73	460	3	0.88	0.9	0.73

Supply Conductor Rating @ 75 Deg C (#2 Copper)
115

Calculated Amps (1.25 (heat + large motor) + Other Loads)
42.70

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 enclosure has a single Allen Bradley disconnect that has integral, 60A fuses

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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 enclosure is supplied from a 60A ABB breaker. It is equipped with an AB main disconnect that has integral Class J, 60A fuses (Bussmann LPJ-60SP). The overcurrent calculation above showed that 60A is appropriate overcurrent 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.

- Supply conductors = #2 AWG Copper and ~ 150' length. The approximated fault current from SWBD-2 down to this control panel was less than 10 kA. With a SCCR rating of 10 kAIC, the panel is compliant

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 = √3 x L x I n x C x E	Total Available Fault Current Itot=Isc+Isym(mot.cont.)	Tran
CT-1	10	55,789	COPPER	500 MCM	NON-MAGNETIC	26706	480	8	0.01	**55268**	
SWBD-2	55	55,268	COPPER	500 MCM	NON-MAGNETIC	26706	480	8	0.05	**52569**	
Hapman 1	150	52,569	COPPER	2 AWG	STEEL	5906	480	1	4.82	**9036**	

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 switchboard that feeds this enclosure has adequate surge protection for AC conductors.

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

NFPA 70, Article 670 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Issues 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)

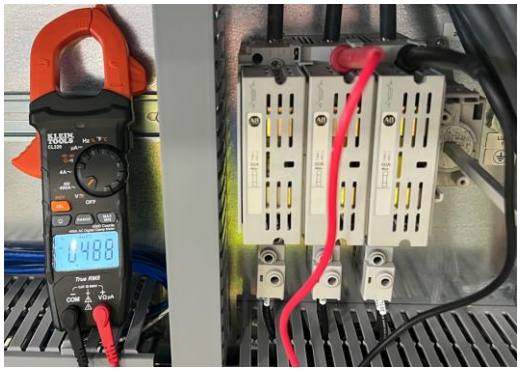
Construction Requirements of NFPA 79:

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 machinery is rated for 480V. It was observed to be operating approximately at 488V line-to-line for AB, BC, and CA phases. This is within the acceptable voltage range. There were not any Line-Neutral loads of 277V present in this enclosure. A 500VA control transformer steps the voltage down to 120V for control voltage, convenience receptacle in enclosure, and feed to 24VDC power supply.

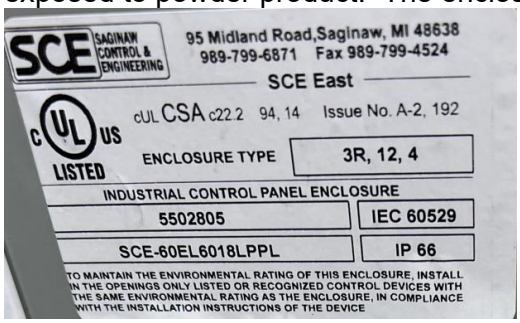
Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024



Environmental

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

- The machinery is installed in an industrial manufacturing environment. It's possible for the enclosure to be exposed to powder product. The enclosure is rated adequately for NEMA 3R, 12, 4 environments



- It is in a temperature-controlled environment within an insulated building. The machinery's operating temperature was approximately 71 Deg F within the enclosure. Ambient temperature was observed to be around 69 Deg F within the building.

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.

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

- See above section. As approximated above, the maximum fault current to this enclosure is less than 10 kAIC, so the panel's 10 kAIC SCCR is appropriate.

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 above section. The enclosure has a single Allen Bradley disconnect that has integral, 60A fuses. It disconnects all of the electrical equipment connected to the industrial control panel and 60A rating is greater than 115% of FLA.

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 The enclosure has a single Allen Bradley disconnect that has integral, 60A fuses. It disconnects all of the electrical equipment connected to the industrial control panel. All parts are guarded that are greater than 50VAC / 60 VDC. An arc flash warning placard is placed near the disconnecting means.

Protection of Equipment

The system has the following protection for the equipment

- Overcurrent
  - Supply Feeder #2 CU: 60A fuses (Bussmann LPJ-60SP)
  - Control XFMR
    - Primary of 500 VA control XFMR : Allen Bradley 1489-M 2P Breaker (4A)
    - Secondary of 500 VA control XFMR : Allen Bradley 1489-M 1P Breaker (7A)

- Other Loads in Enclosure
  - Enclosure Fan & Receptacle (120VAC): Allen Bradley 1489-M 1P Breaker (3A)
  - Power Supply (120VAC): Allen Bradley 1489-M 1P Breaker (1A)
  - DC Power (24VDC): Allen Bradley 1489-M 1P Breaker (5A)
  - DC Power (24VDC): Allen Bradley 1489-M 1P Breaker (4A), Terminal Jumper
  - DC Power (24VDC): Allen Bradley 1489-M 1P Breaker (3A), Terminal Jumper
  - 24VDC Devices
    - Hardy Weight Controllers (3 Total)
    - Allen Bradley Safety Relay Power (1 Total)
    - Allen Bradley Panelview HMI (1 Total)
    - Allen Bradley Stratix 5700 (1 Total)
    - Allen Bradley CompactLogix L24ER QB1B (1 Total)
    - Bulk Bag Bar Grate SensaGuard (2 Total)
    - Solimar (1 Total)


- Motor Protection (12 Total)
  - Each motor circuit is protected with Allen Bradley 140MT-C3E Class 10 motor circuit protector which has integral overload protection via thermal trip. This MCP accounts for motor inrush & allows the system to operate as intended. The 140MT-C3E has a short circuit rating of at least 65 kAIC at 480V and is rated as motor disconnect.
    - Conveyor Motor (FLA 6.5A) - Observed Trip Setting on MCP: **13.8A**
    - Inlet Rotary Valve #1 Motor (FLA 1.6A) - Observed Trip Setting on MCP: **3.2A**
    - Inlet Rotary Valve #2 Motor (FLA 1.6A) - Observed Trip Setting on MCP: **3.2A**
    - Dump Inlet Rotary Valve Motor (FLA 1.6A) - Observed Trip Setting on MCP: **3.2A**
    - Chain Hammer #1 Motor (FLA 0.73A) - Observed Trip Setting on MCP: **0.73A**
    - Carryover Chain Hammer Motor (FLA 0.73A) - Observed Trip Setting on MCP: **0.73A**
    - Dust Collector Blower Motor (FLA 3.4A) - Observed Trip Setting on MCP: **3.4A**
    - Hoist & Trolley #1 Motor (FLA 5.8A) - Observed Trip Setting on MCP: **5.9A**
    - Hoist & Trolley #2 Motor (FLA 5.8A) - Observed Trip Setting on MCP: **5.9A**
    - Dump Station Vibrator Motor (FLA 0.16A) - Observed Trip Setting on MCP: **0.16A**
    - BBU #1 Vibrator Motor (FLA 0.16A) - Observed Trip Setting on MCP: **0.16A**

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

- BBU #2 Vibrator Motor (FLA 0.16A) - Observed Trip Setting on MCP: **0.16A**

Bulletin No.	**140MT-C**
Frame Size	C-Frame
Max. Current I_e	32 A
Current Rating	0.1...32 A
Short-circuit protection	✓
Standard magnetic trip	✓
High magnetic trip	–
Magnetic-only trip (Motor Circuit Protector [MCP])	–
Overload protection	✓
Trip Class	10
Phase loss sensitivity	✓
Short-circuit Indication	✓
Variable-frequency Drive (VFD) downstream compatible	–
UL 60947-4-1 Application Ratings:	
Motor Disconnect	✓ (see ratings)
Group Installation	✓ (see ratings)
Tap Conductor Protection	✓ (see ratings)
Manual, Self Protected (Type E)	✓ (see ratings)
Type F ratings with 100-C and 100-E Contactors	✓ (see ratings)

- Overvoltage Protection – Safety Circuit
  - NFPA 79 requires the safety signals have surge/overvoltage protection. The safety relay is powered from 24VDC & the 120VAC to 24VDC power supply has built-in surge/over voltage protection (Emerson SOLA SVL 5-24-100) that is latching. The signals from the safety relay to the VFDs are also 24VDC

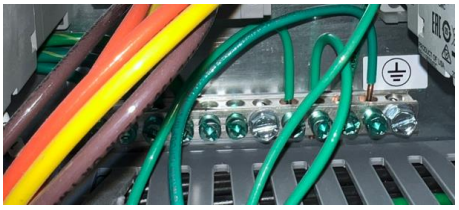
Protections		
Overvoltage Protection	16-18.7 V, Latching	30-34.8 V, Latching
Overload Protection	Current foldforward and then hiccup	
Over Temperature Protection	No Component Damage, Latch Mode	
Short Circuit	Hiccup Mode, Non-Latching (Auto-Recovery when the fault is removed)	
Power Factor Correction	Meets EN61000-3-2 Class A	

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.

- Main Ground Lug for supply conductors is identified with the symbol and conductor has green colored insulation. Each electrical equipment within the enclosure is properly bonded to ground & has a dedicated termination for the equipment grounding conductor (solid green or with a green/yellow stripe) that’s sized in compliance with NFPA 70, Article 250.122 for the upstream overcurrent protection trip threshold. The control XFMR is bonded on the secondary & case. Each VFD is bonded appropriately for the connected motor. Enclosure’s doors had a separate bonding jumper to ensure continuity was maintained at all times.

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024






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 enclosure is equipped with an Allen Bradley safety relay that interlocks the (4) VFDs. There is also an emergency stop button that's compliant with NFPA 79's standards; the components were tested to ensure it interrupted the system when engaged.

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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)

  - There is an emergency stop button on the PLC enclosure and the dust collector operator interface is within 10’ of the main enclosure. The dust collector has a local start (GREEN), stop (RED), and on (GREEN) push-buttons. There is a stack light with red, green, and yellow. These interfaces are compliant with NFPA 79’s recommended color code for the associated control function.

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024


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.


Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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.

- Supply conductors / raceways were observed to be compliant during the evaluation. Exposed conductors were observed to be copper and sized appropriately for the connected loads. It appeared that the installation followed UL508a's recommended color codes for voltages, AC/DC loads, and grounded/ungrounded. Insulation was observed to be rated for 600V. Conductors with differing voltages were ran in separate raceways/Panduit where possible.
  - Supply Conductors - #2 AWG CU
  - Control XFMR Conductors - #14 AWG CU
  - Fan Thermostat Conductors - #16 AWG CU
  - Motor Conductors - #12 AWG CU
  - DC Conductors - #14 AWG CU
  - 120VAC Conductors - #14 AWG 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.

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 were installed in compliance with manufacturer & matched provided design drawings; they're accessible and future maintenance will be able to be done for each motor. Each motor had a starter (VFD or across the line) that were sized appropriately for the connected motor. All components were listed and intended for use with the motors. Nameplate data was similar to the design drawings.

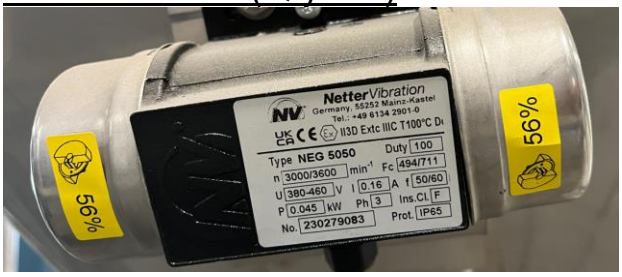
Inlet Rotary Valve, VFD (Qty = 3)

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

Conveyor Motor, VFD (Qty = 1)

Trolley / Hoist Motors (Qty = 2)

Vibrator Motor (Qty = 3)



Marking and Safety Signs

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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*
  - The label was placed visibly on Enclosure since Voltage was greater than 50VAC or 60VDC

- Nameplate - See above section for picture with information below
  - 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

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.

- Industrial machinery has drawings within enclosure & is numbered H20319DA-B00

NFPA 79 Compliance Result:

☒ PASS

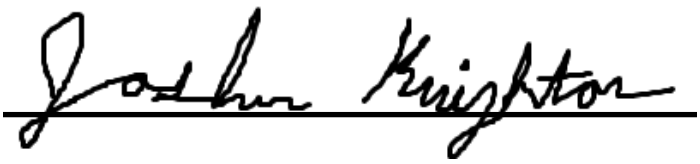
☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Muth Power Solutions
6800 North Diane Circle • Sioux Falls, SD 57107
PHONE (605) 338-6586 · FAX (605) 338-1441
www.muthelectric.com

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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.



October 25, 2024

Date:

Joshua J. Knighton
Professional Engineer

Field Evaluation Number: MPS-FEB-060001 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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**	**Observation**	**Corrective Action Required**
-	-	Cables for VFD are ran THHN and installed in conduit with non-VFD cables. It was also noted that load wiring from the VFD was not shielded VFD cabling & there was not a reactor installed for the VFD	No - These are just observations in case issues arise in the future with EMI or harmonics. It's not likely since these are small motors.
-	-	Hoist/Trolley molded cables freely dangle down to the hoist control interface without any tie down. There are not any obvious ways this cable can be damaged as-is	No – I don't know if there's a good way to anchor this cable, but it may be worth having signage that reminds an operator to check that the cable isn't hung up on any equipment before any recipe is started
		One of the structural supports is missing an anchor bolt for the BBU frame 	No – this doesn't cause a fail of the field evaluation, but operationally, it should be corrected before the equipment is operated

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

IP ADDRESS:
192.168.200.105

HMI7081

IP ADDRESS:
192.168.200.90

VPN8181

IP ADDRESS:
192.168.200.100

PLC 13001

BULK BAG #1 HARDY
IP ADDRESS:
192.168.200.120

WC21001

BULK BAG #2 HARDY
IP ADDRESS:
192.168.200.121

WC22001

DUMP STATION HARDY
IP ADDRESS:
192.168.200.122

WC22001

ENET–8042

ENET–8051

ENET–8052

ENET–8061

ENET–8071

ENET–8041

IP: 192.168.200.101
SUBNET: 255.255.255.0
GW: 0.0.0.0

PORT 8
PORT 7
PORT 6
PORT 5
PORT 4
PORT 1
PORT 2
PORT 3
PORT 9
PORT 10
PORT 11
PORT 12
PORT 13
PORT 14
PORT 15
PORT 16

ES8001

ENET–8032

PORT6071

ENET–8021

ENET–8022

ENET–8031

ENET–8062

VFD2011

TUBULAR CONVEYOR
IP ADDRESS:
192.168.200.110

VFD3011

INLET ROTARY
VALVE #1
IP ADDRESS:
192.168.200.111

VFD4011

INLET ROTARY
VALVE #2
IP ADDRESS:
192.168.200.112

VFD4191

DUMPER STATION INLET
ROTARY VALVE
IP ADDRESS:
192.168.200.113

HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343–1675 FAX (269) 349–2477

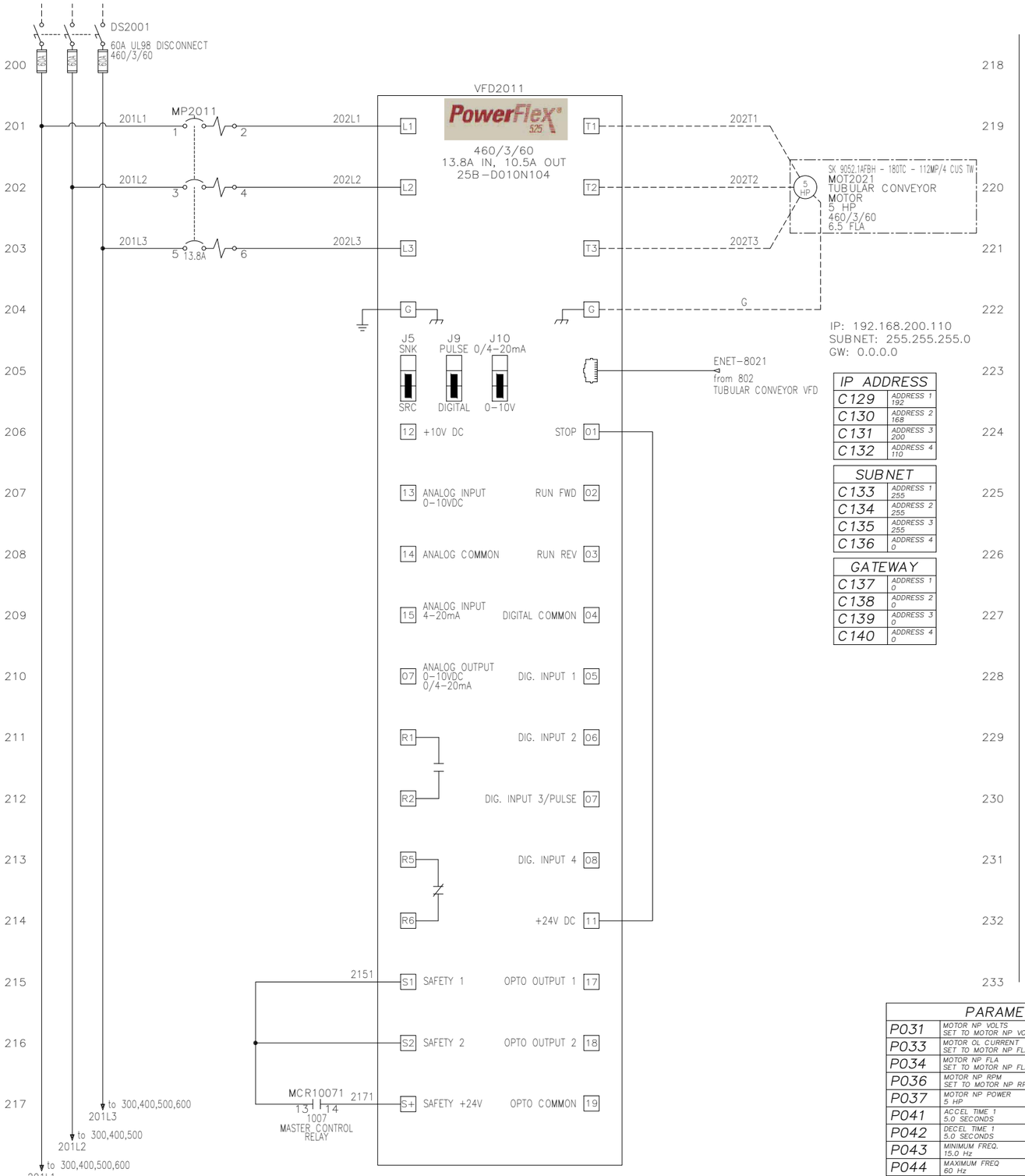
DATE 4/10/23	JOB NO. H20319–DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
NETWORK WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
1	27	H20319DA–B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



IP ADDRESS	
C129	ADDRESS 1 192
C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 110

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P031	MOTOR NP VOLTS SET TO MOTOR NP VOLTS
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P036	MOTOR NP RPM SET TO MOTOR NP RPM
P037	MOTOR NP POWER 5 HP
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15.0 Hz
P044	MAXIMUM FREQ 60 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP
t070	OPTO OUT1 LEVEL 52%

PARAMETER SETTINGS	
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETYFLT RSTCFG 1 – FLTCLR RESET
A431	JOG FREQUENCY 15.0 Hz
A432	JOG ACCEL/DECEL 5.0 SECONDS
A486	SHEAR PIN1 LEVEL 5.5A
A487	SHEAR PIN 1 TIME 0.10s
A490	LOAD LOSS LEVEL HAPMAN TO SET TO DESIRED LEVEL
A491	LOAD LOSS TIME 1.0s
C128	EN ADDR SEL 1 – PARAMETERS
—	– –
—	– –
—	– –
—	– –

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ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

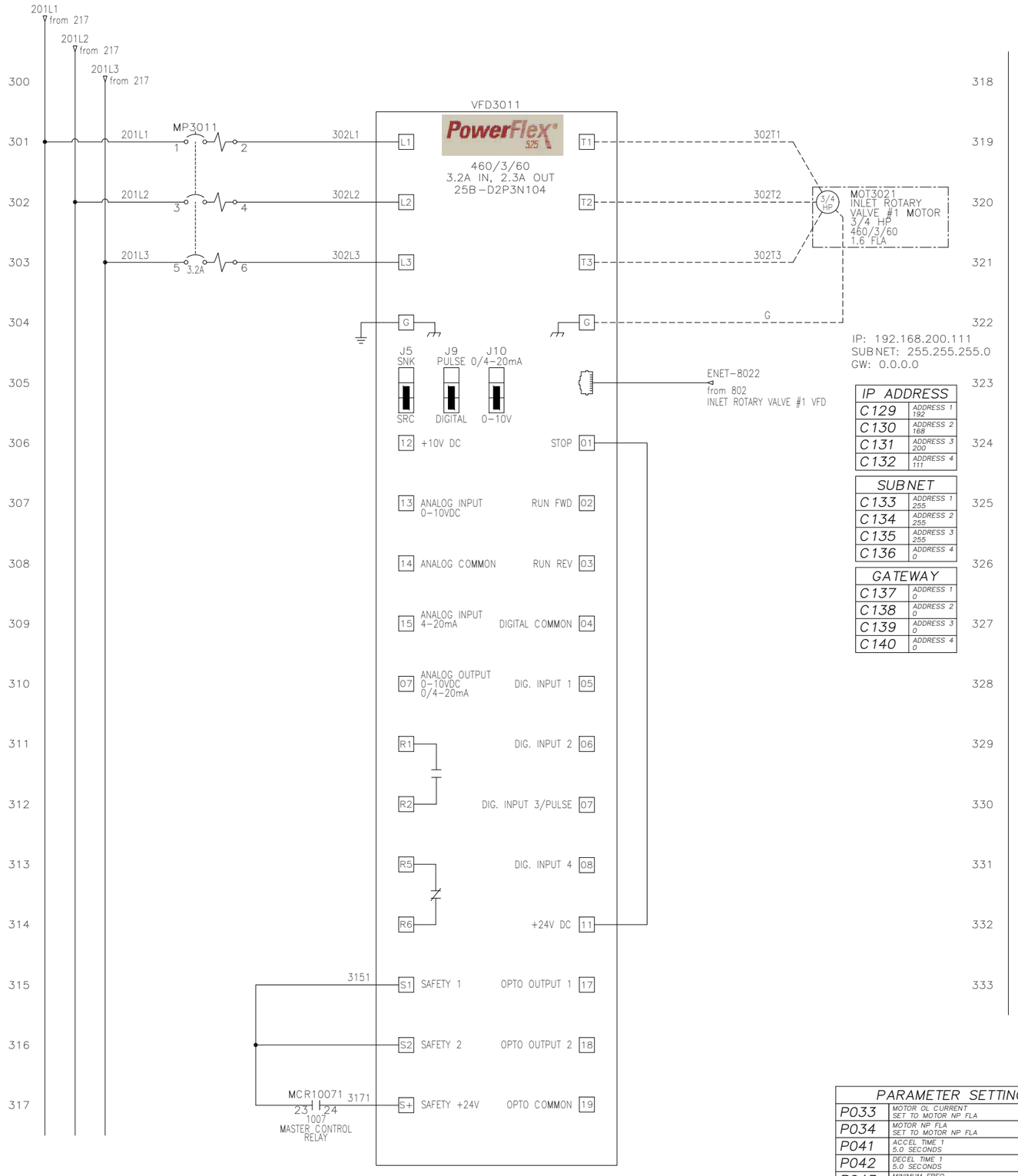
DATE	4/10/23	JOB NO.	H20319-DA, HA & LA	DRAWN	MRL
SCALE	N/A			BOM = 1	DWG = 1

TITLE
MOTOR WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
2	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



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SUBNET: 255.255.255.0
GW: 0.0.0.0

IP ADDRESS	
C129	ADDRESS 1 192
C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 111

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP

PARAMETER SETTINGS	
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETY FAULT RESET 1 – FAULT CLEAR RESET
C128	EN ADDR SEL 1 – PARAMETERS
–	– –
–	– –
–	– –
–	– –
–	– –

HAPMAN
ideas that move

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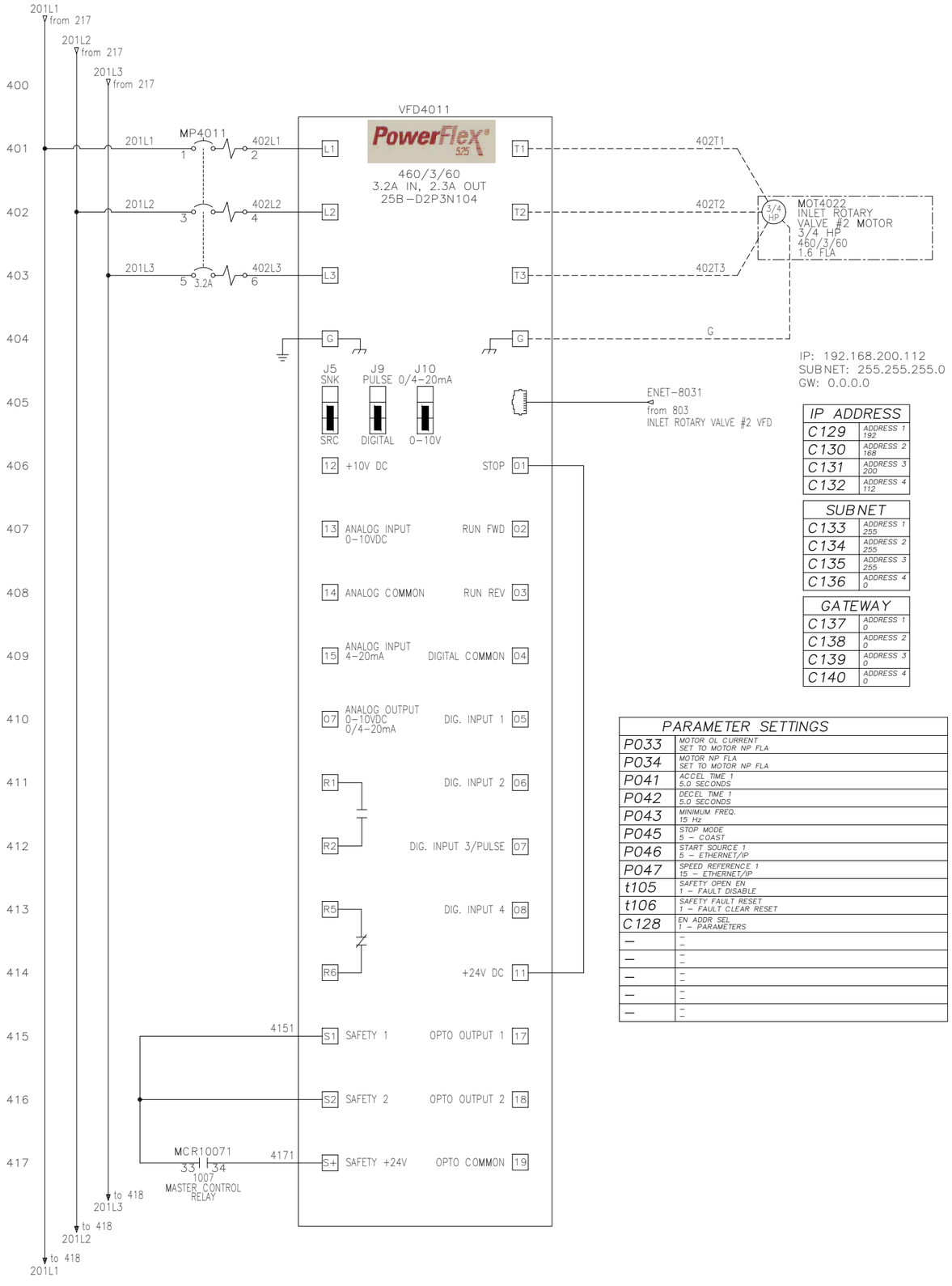
DATE	4/10/23	JOB NO.	H20319-DA, HA & LA	DRAWN	MRL
SCALE	N/A			BOM = 1	DWG = 1

TITLE
MOTOR WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
3	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



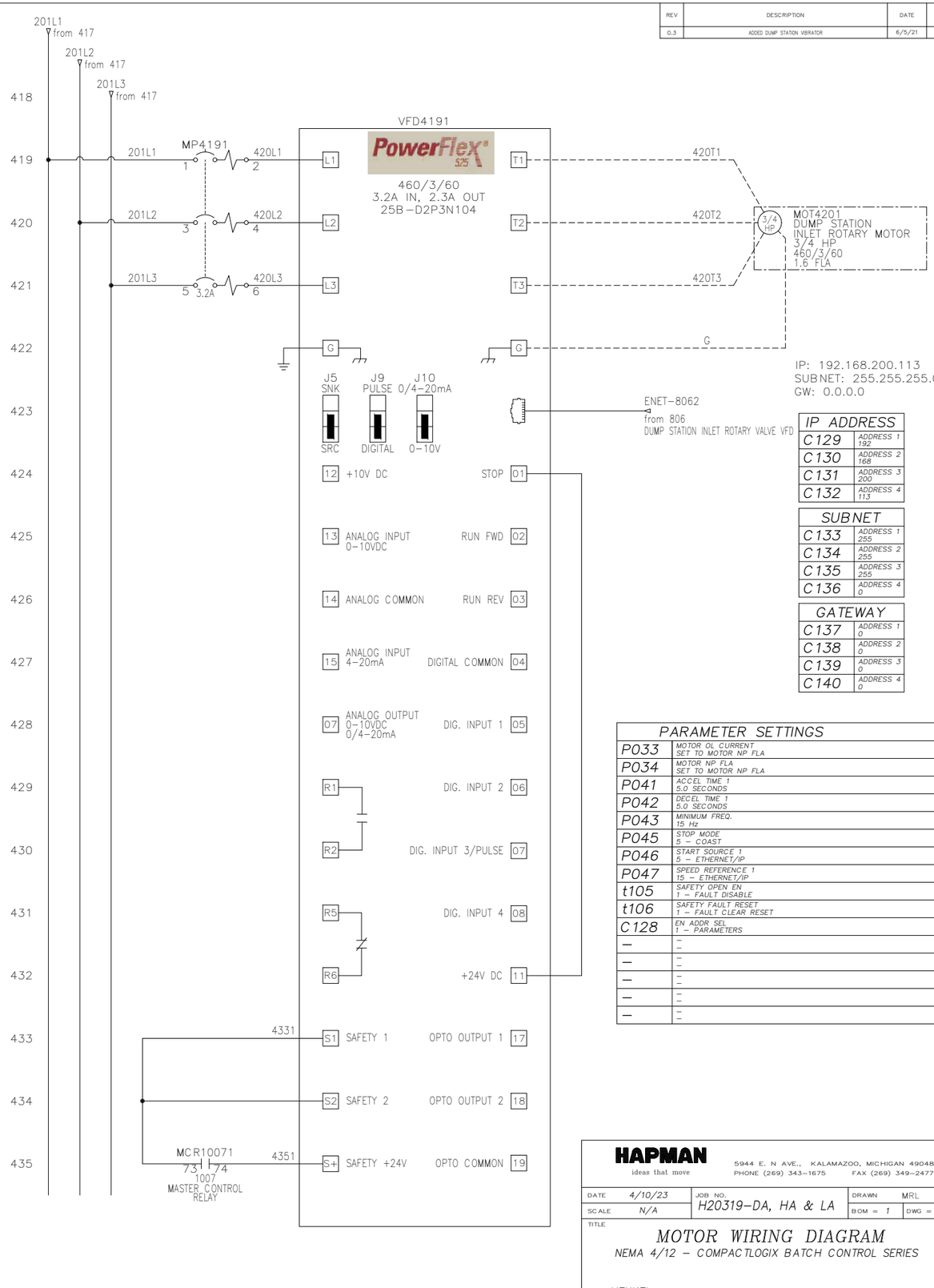
IP: 192.168.200.112
SUBNET: 255.255.255.0
GW: 0.0.0.0

IP ADDRESS	
C129	ADDRESS 1 192
C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 112

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETY FAULT RESET 1 – FAULT CLEAR RESET
C128	EN ADDR SEL 1 – PARAMETERS
–	– –
–	– –
–	– –
–	– –
–	– –



IP: 192.168.200.113
SUBNET: 255.255.255.0
GW: 0.0.0.0

IP ADDRESS	
C129	ADDRESS 1 192
C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 113

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETY FAULT RESET 1 – FAULT CLEAR RESET
C128	EN ADDR SEL 1 – PARAMETERS
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HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

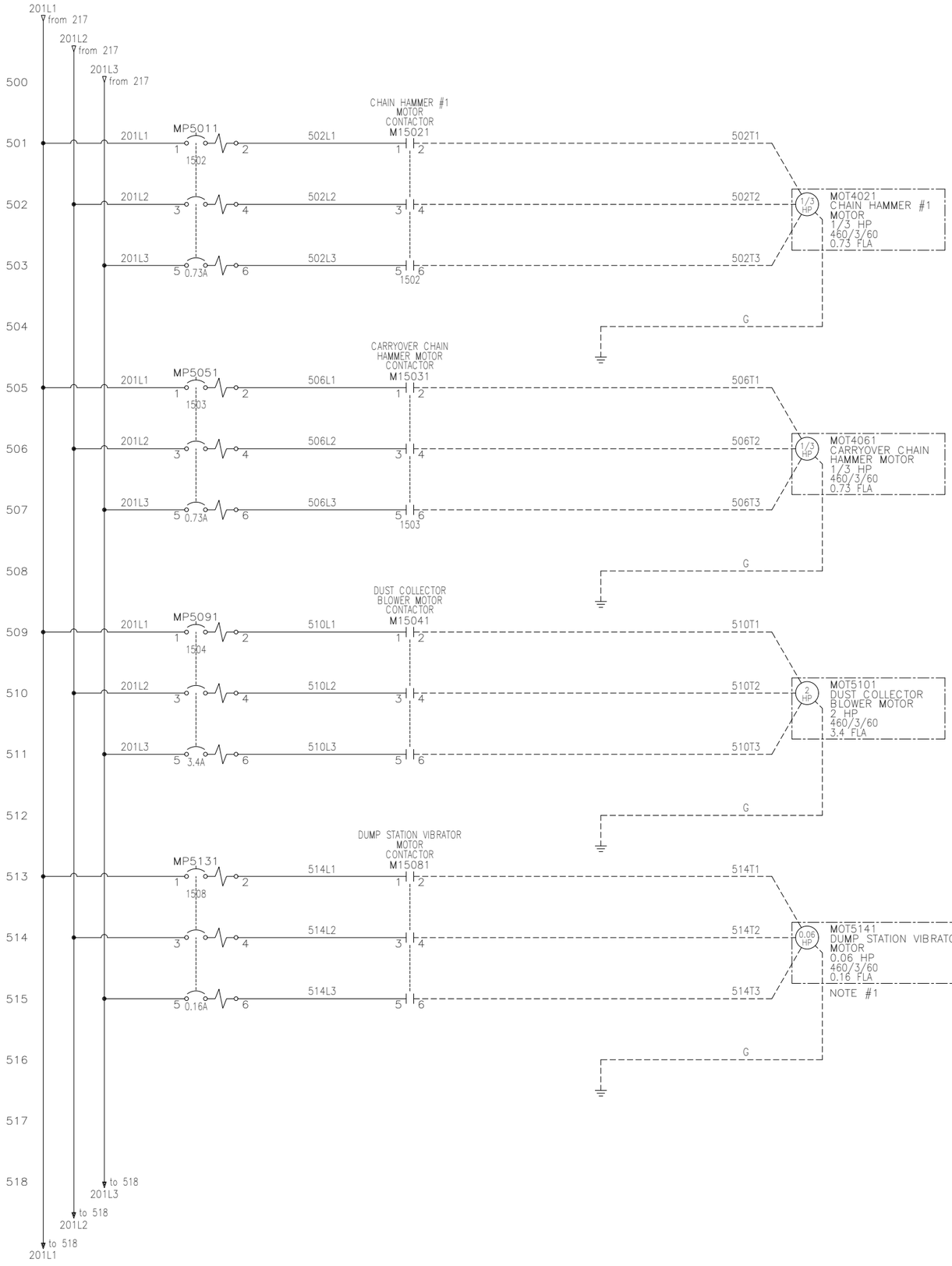
DATE	4/10/23	JOB NO.	H20319-DA, HA & LA	DRAWN	MRL
SCALE	N/A			BOM = 1	DWG = 1

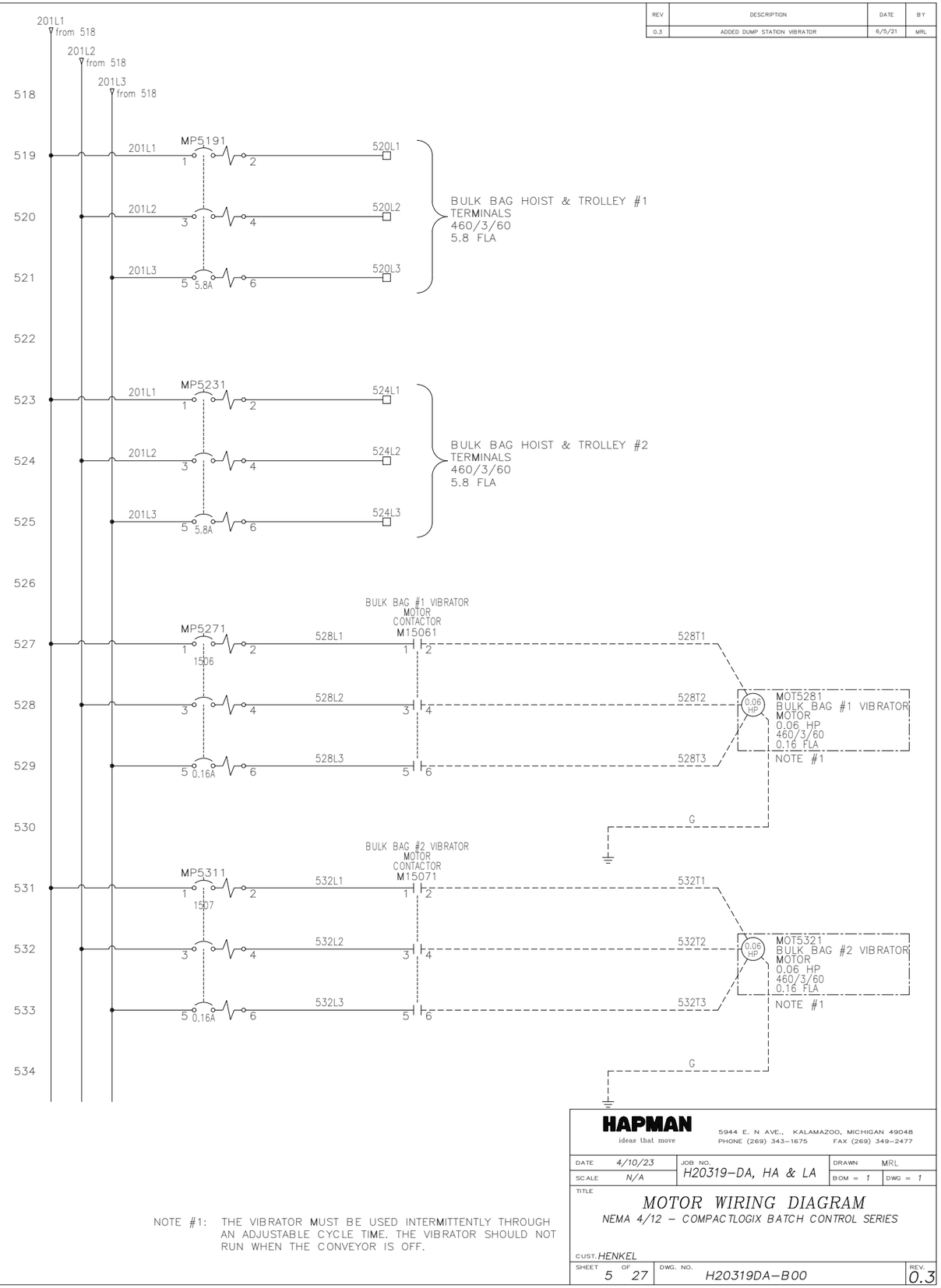
TITLE
MOTOR WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
4	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





NOTE #1: THE VIBRATOR MUST BE USED INTERMITTENTLY THROUGH AN ADJUSTABLE CYCLE TIME. THE VIBRATOR SHOULD NOT RUN WHEN THE CONVEYOR IS OFF.

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PHONE (269) 343-1675 FAX (269) 349-2477

DATE	JOB NO.	DRAWN
4/10/23	H20319-DA, HA & LA	MRL
SCALE N/A		BOM = 1 / DWG = 1

TITLE

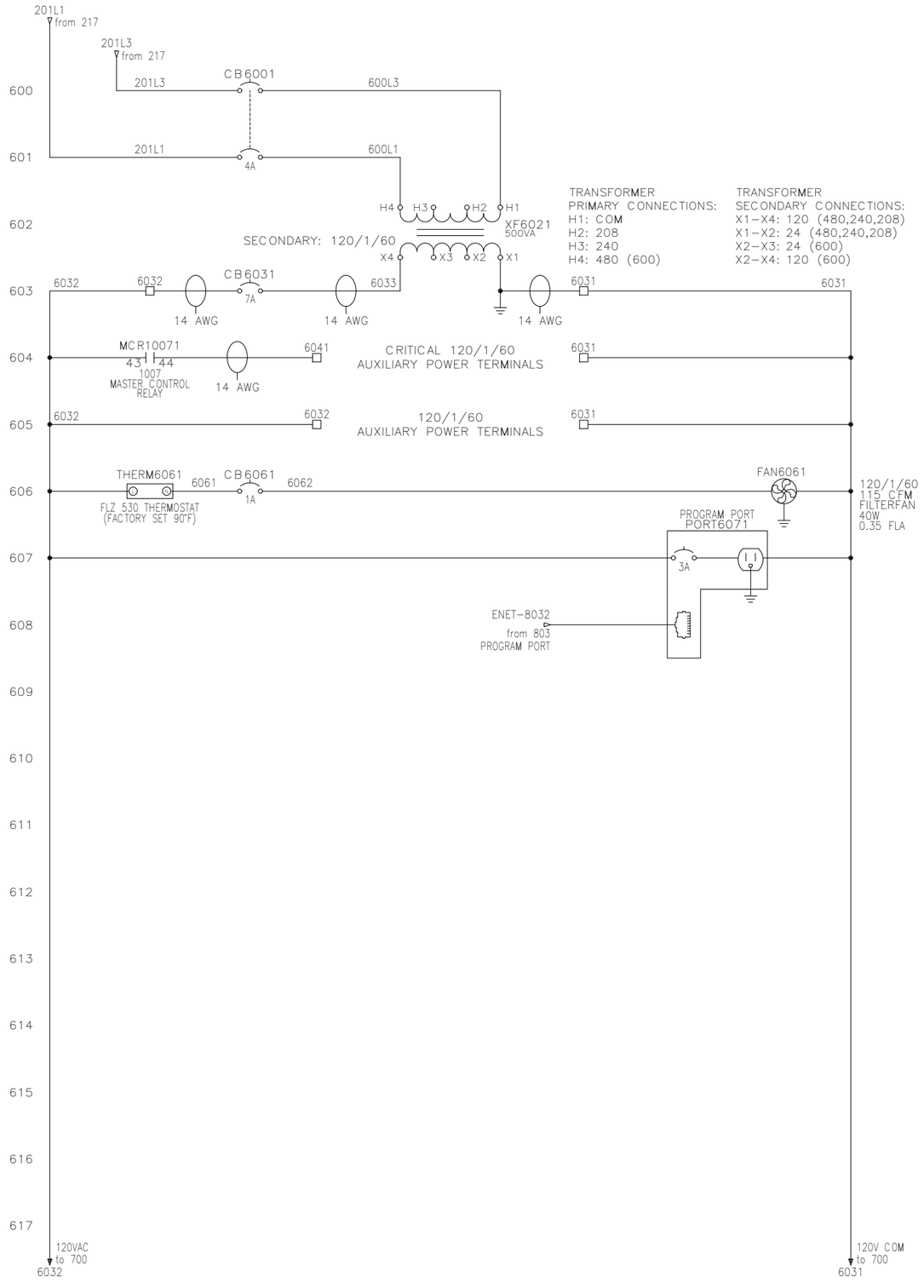
MOTOR WIRING DIAGRAM

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
5	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



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ideas that move
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PHONE (269) 343–1675 FAX (269) 349–2477

DATE 4/10/23	JOB NO. H20319–DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

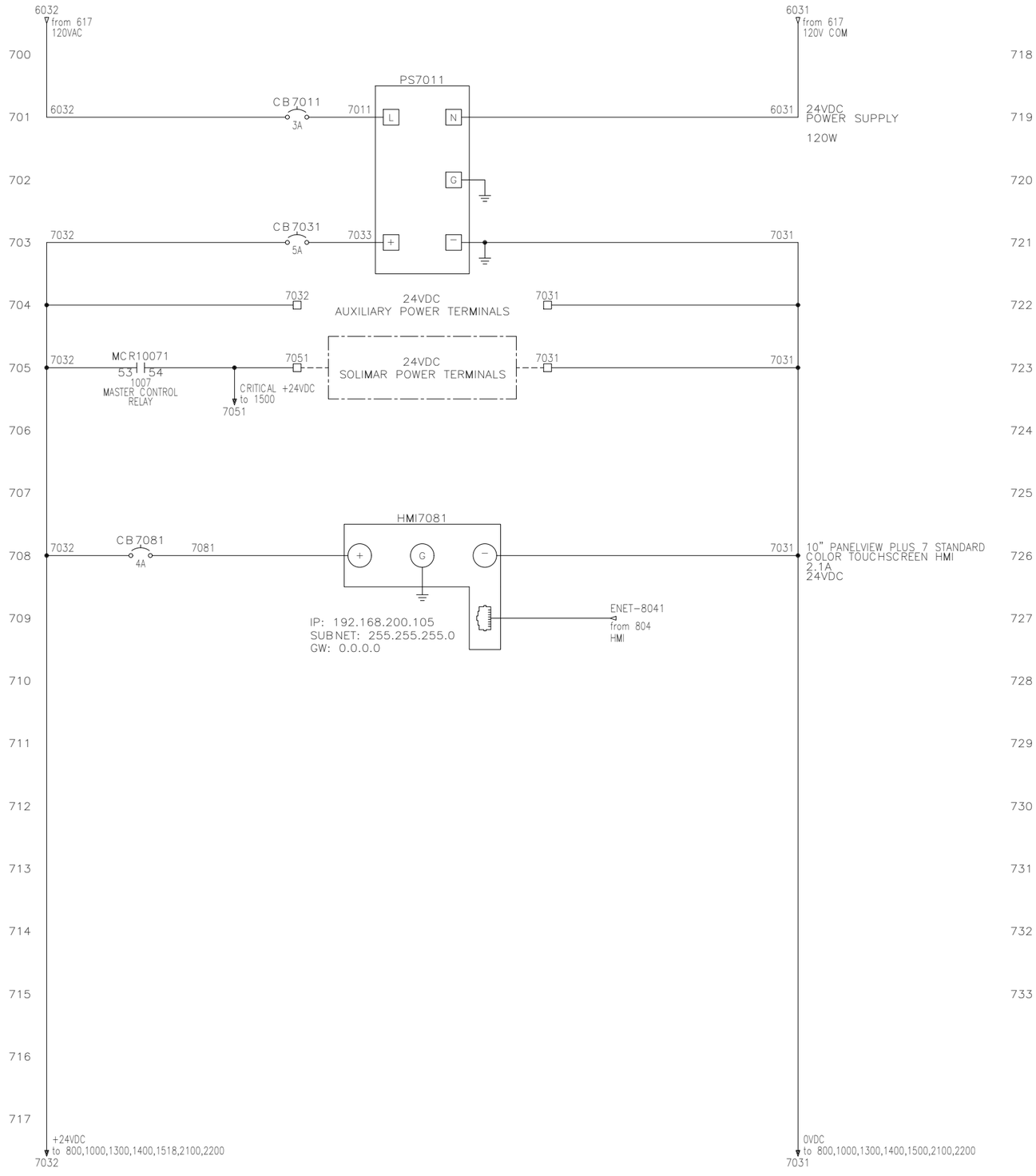
120VAC WIRING DIAGRAM

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	DWG. NO.	REV.
6 OF 27	H20319DA–B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



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ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

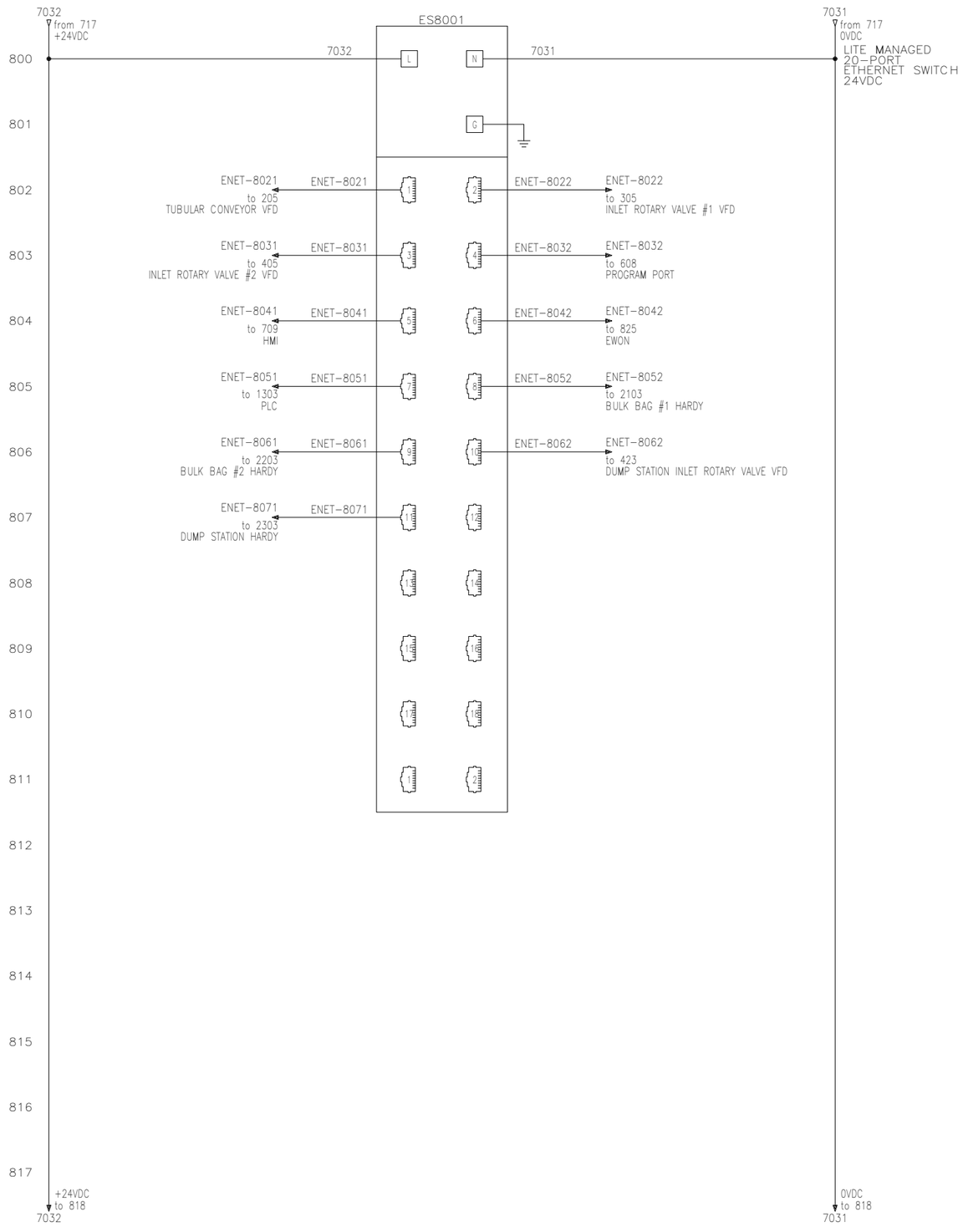
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

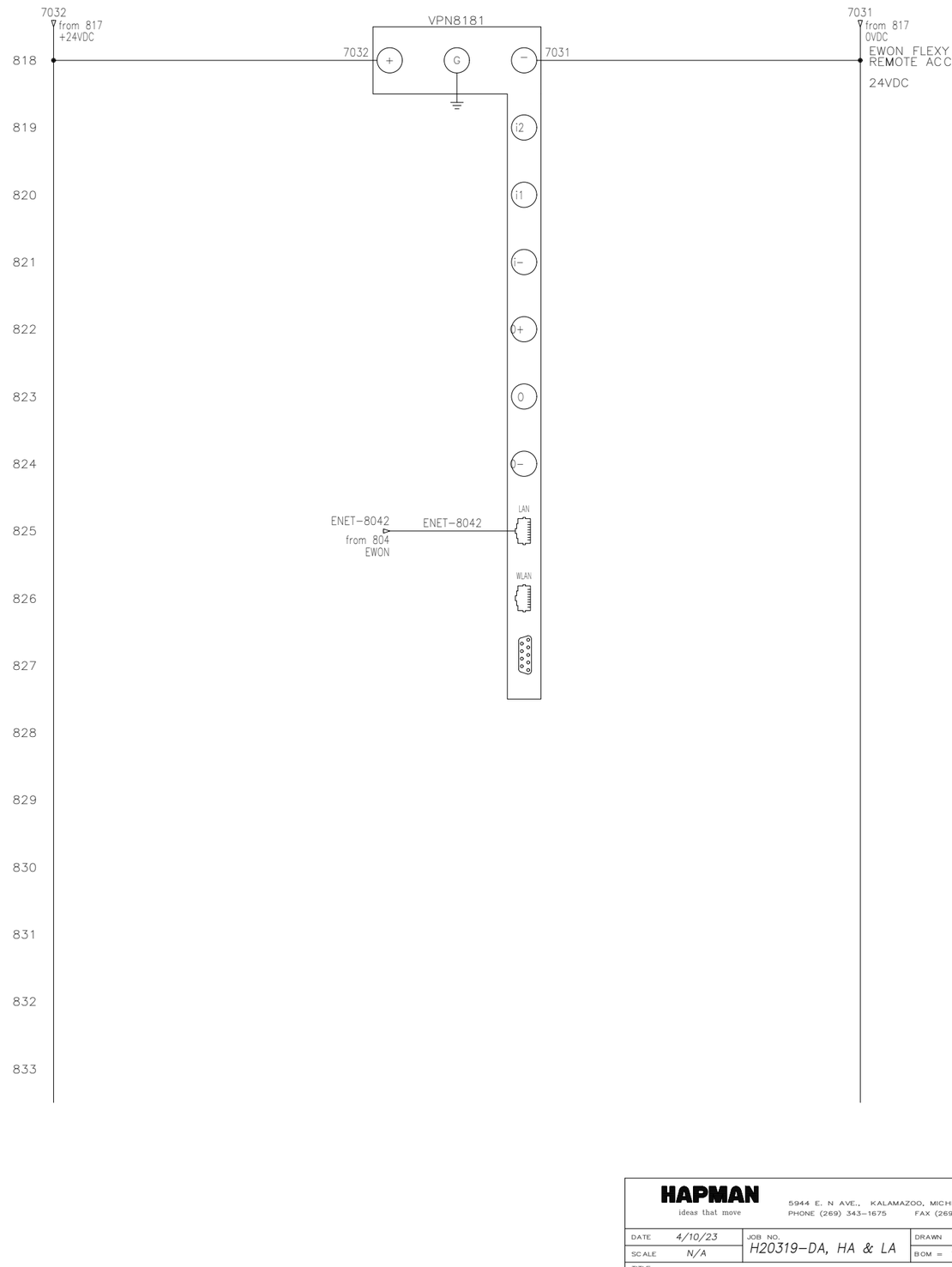
TITLE
24VDC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
7	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
24VDC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET 8 OF 27	DWG. NO. H20319DA-B00	REV. 0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

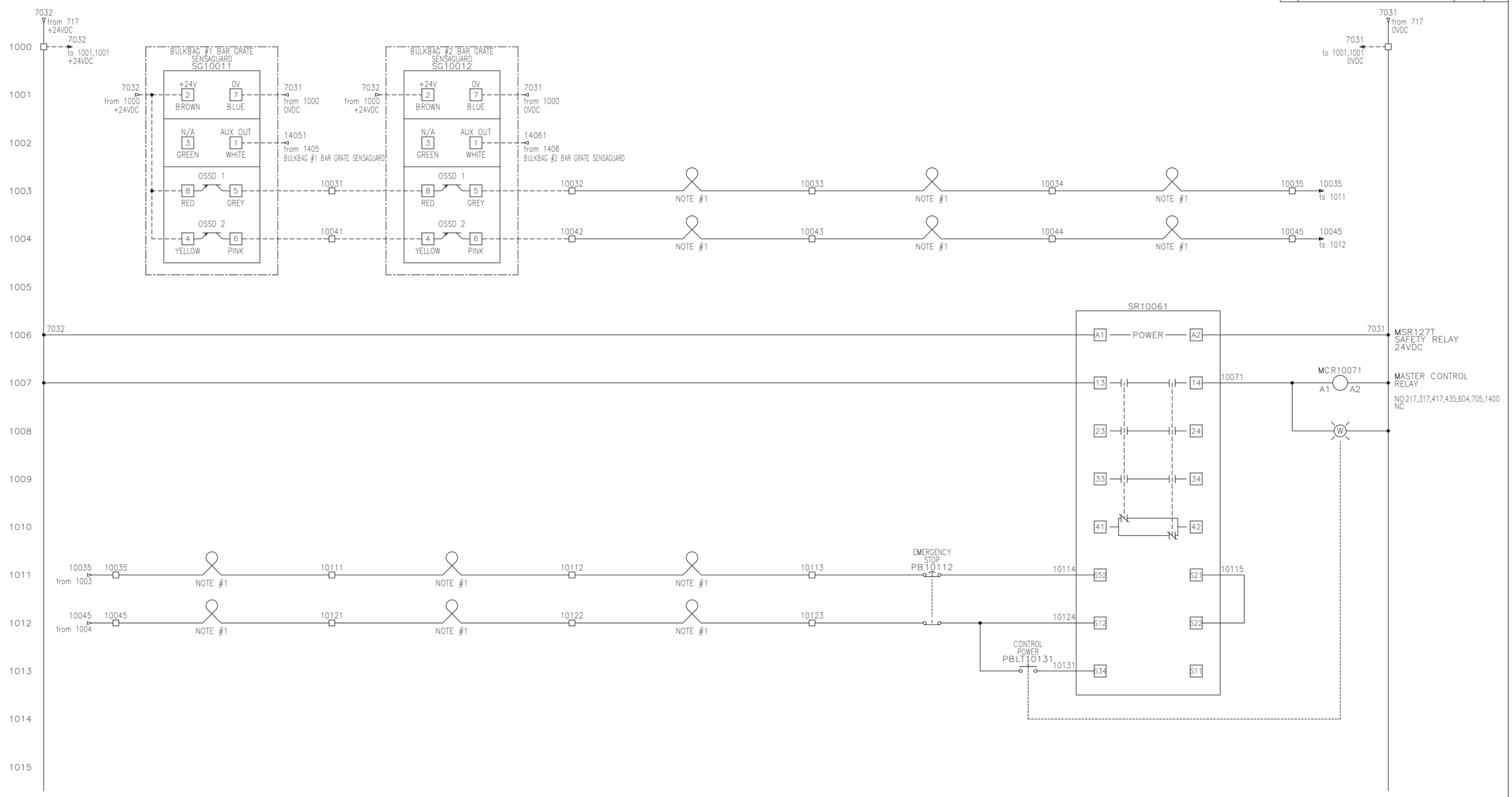
RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET	DWG. NO.	REV.
9 OF 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



NOTES:
1. REMOVE JUMPER IF CIRCUIT IS UTILIZED

HAPMAN
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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
SAFETY RELAY WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
10 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
11 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
RESERVED
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

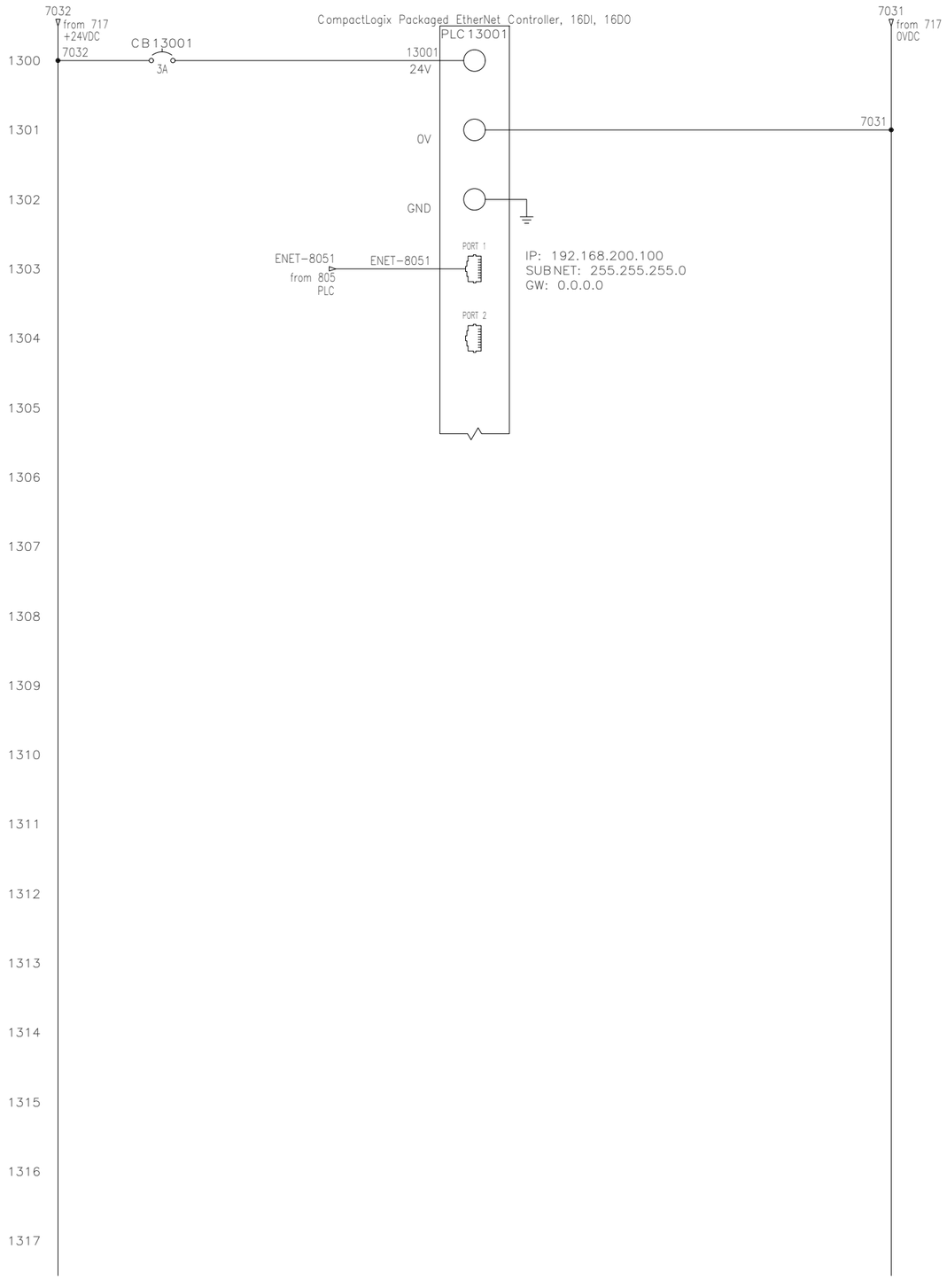
CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
12 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

Allen-Bradley
1769-L24ER-QB1B

CompactLogix Packaged EtherNet Controller, 16DI, 16DO



HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

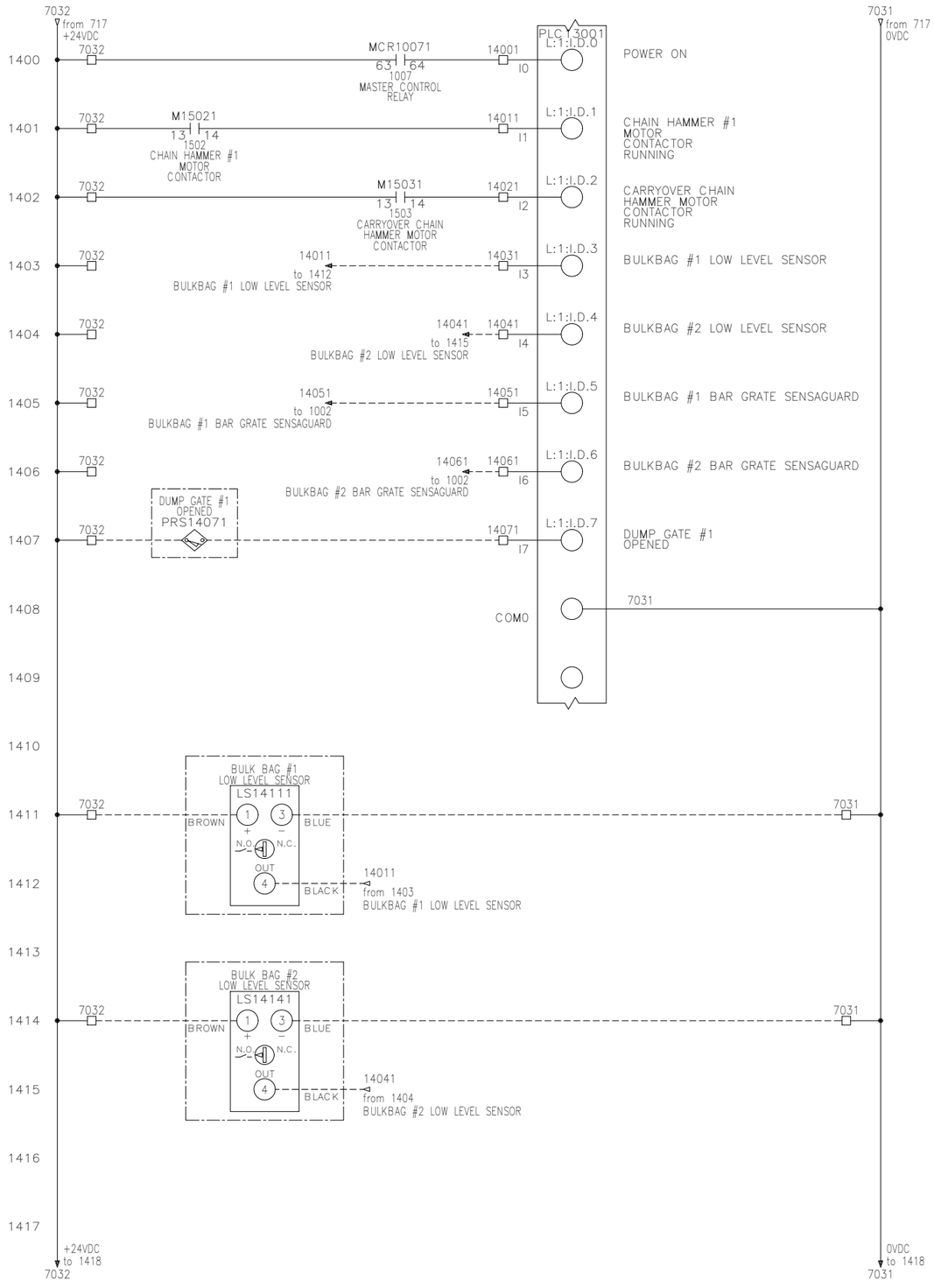
PLC WIRING DIAGRAM

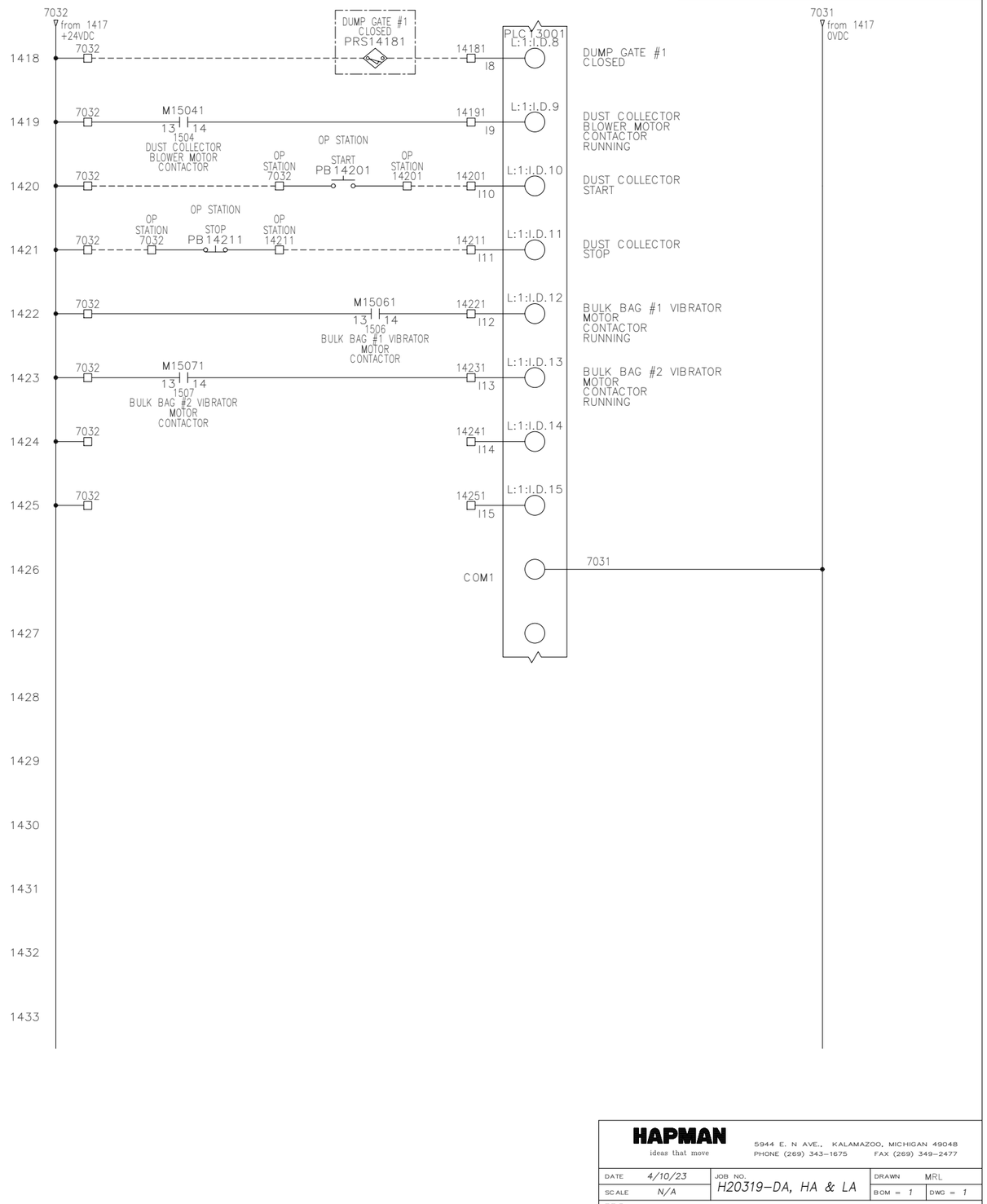
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
13 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





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PHONE (269) 343-1675 FAX (269) 349-2477

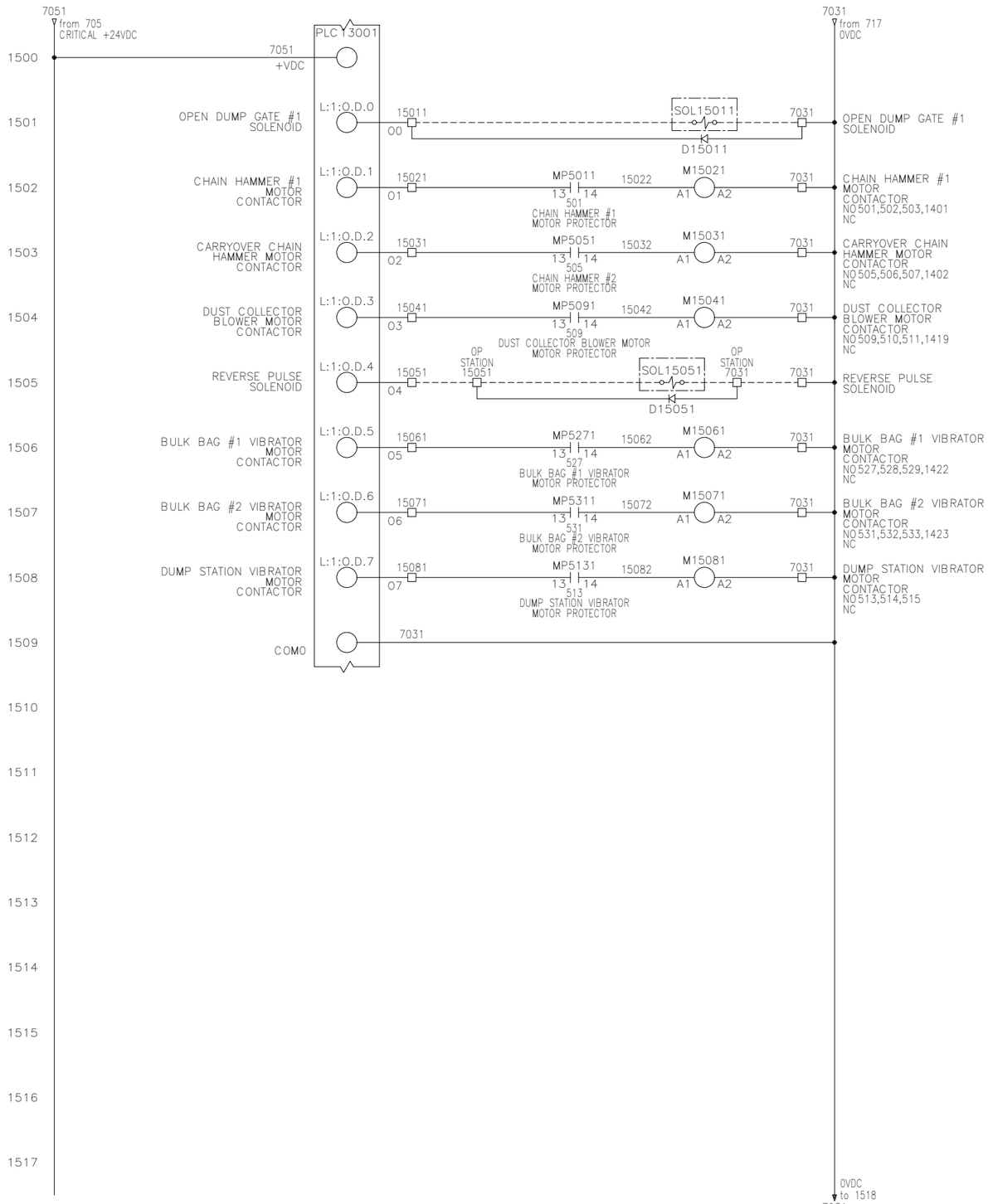
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

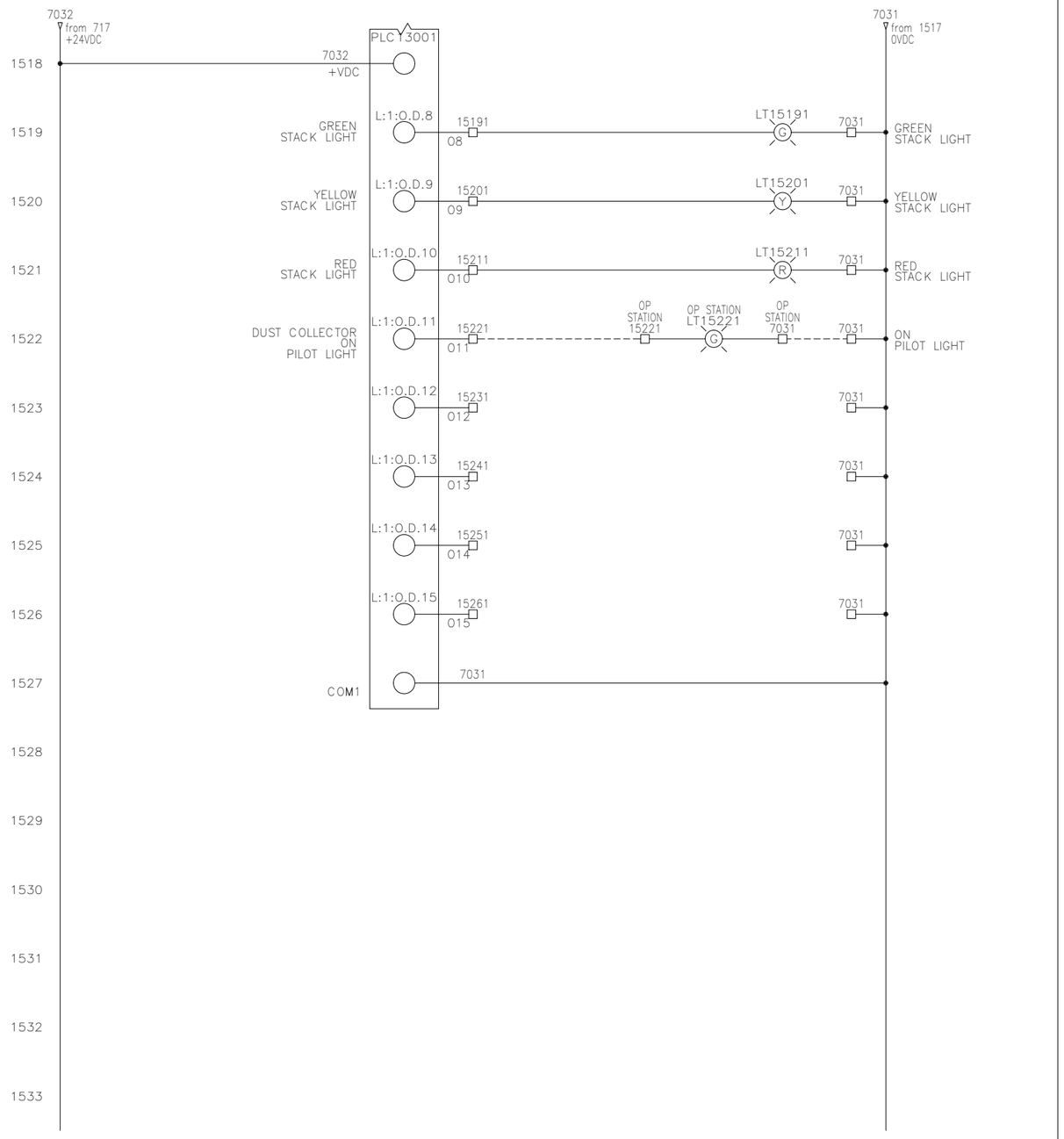
TITLE
PLC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
14 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





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5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
PLC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
15 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
RESERVED
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
16 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
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DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
17 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
18 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
19 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

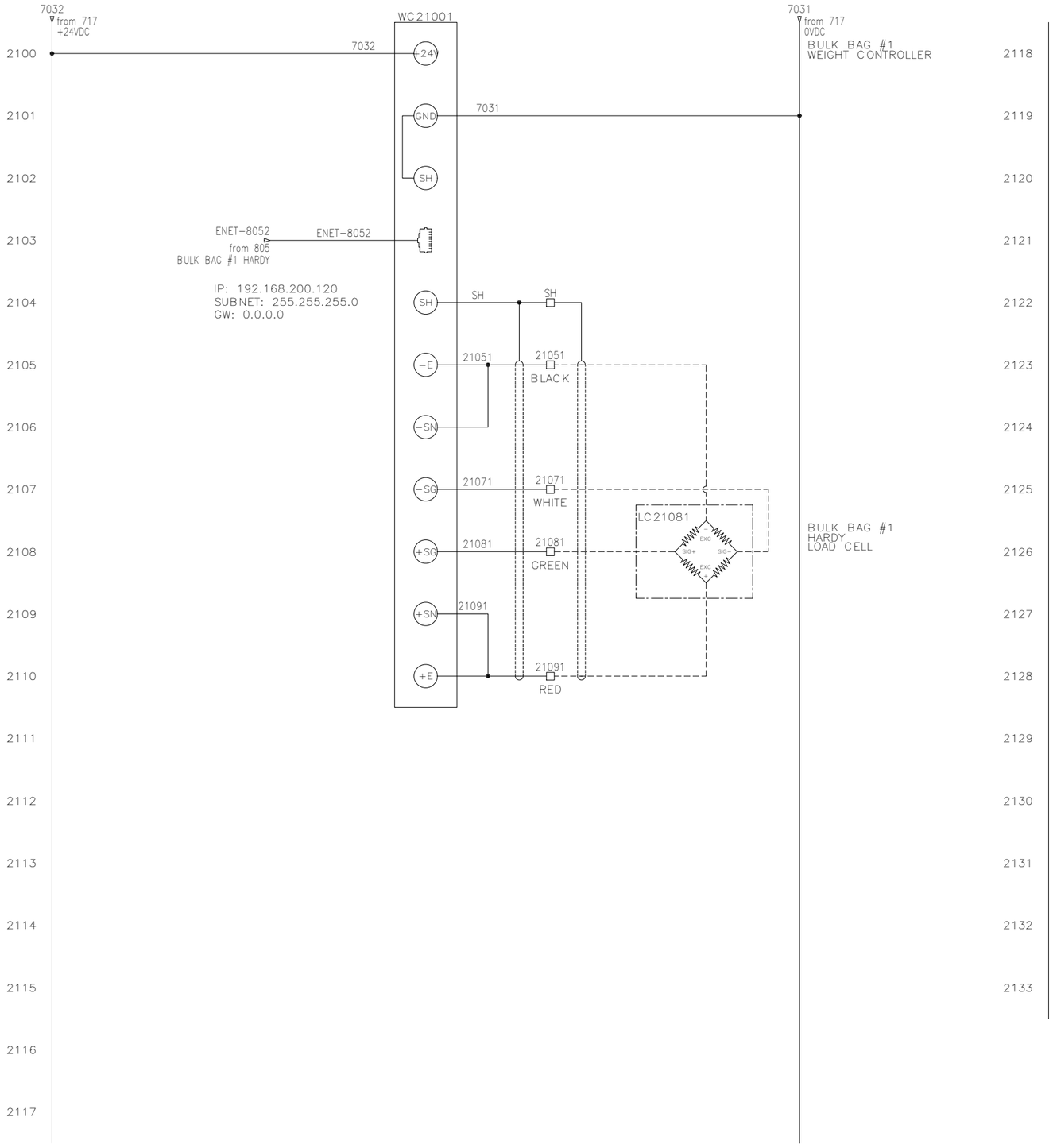
RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
20 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

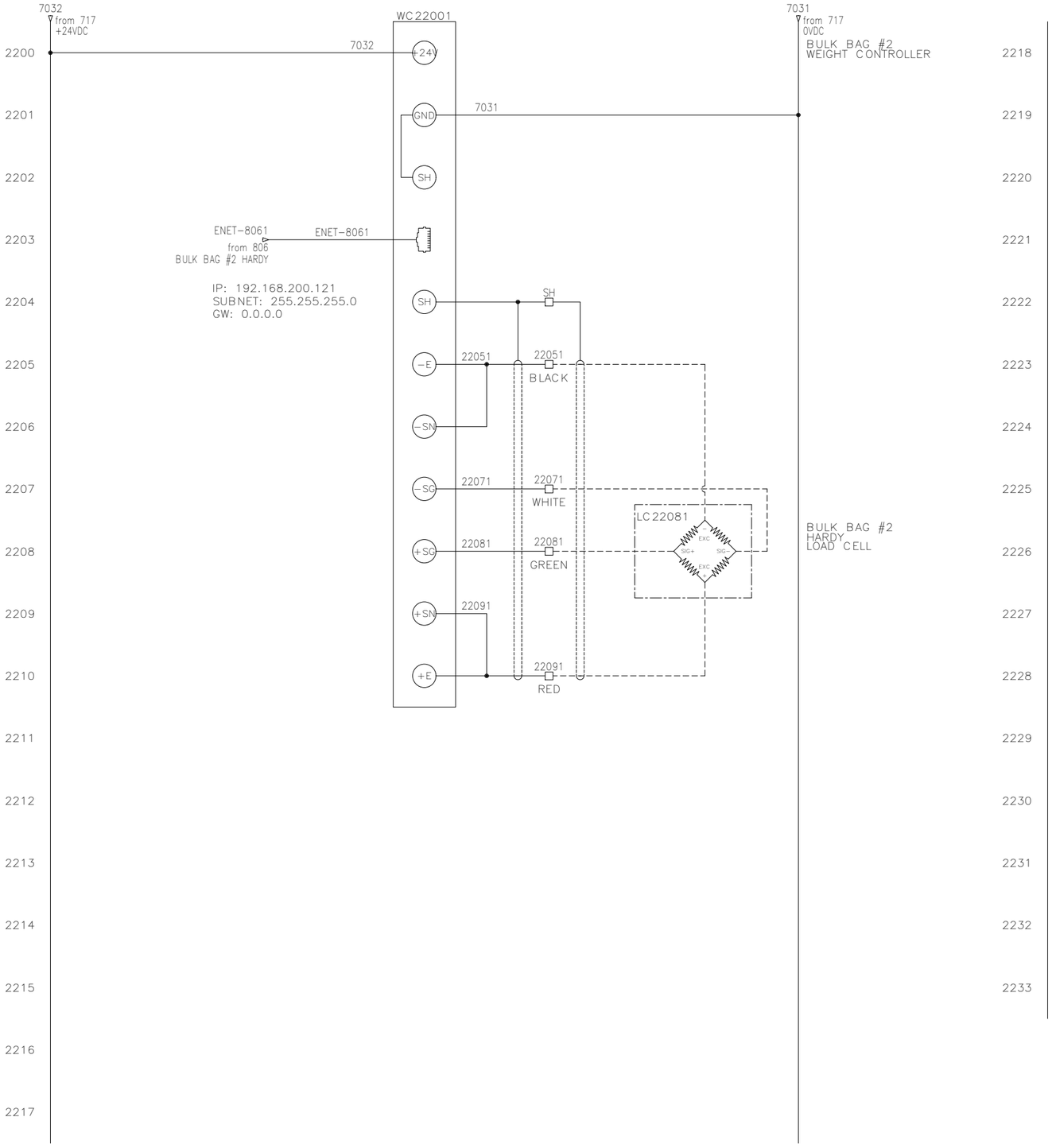
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
HARDY WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
21 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

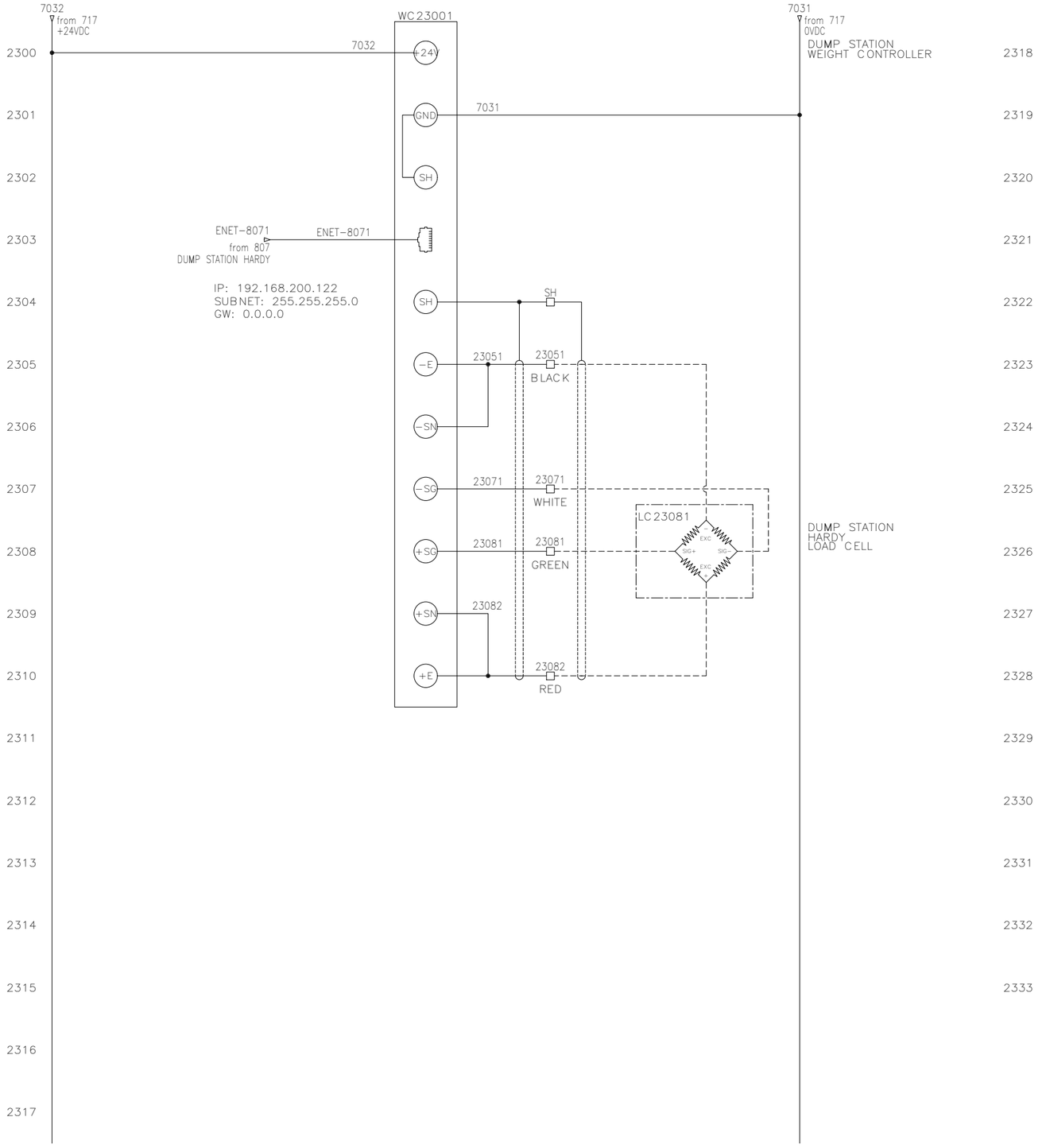
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
HARDY WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
22 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

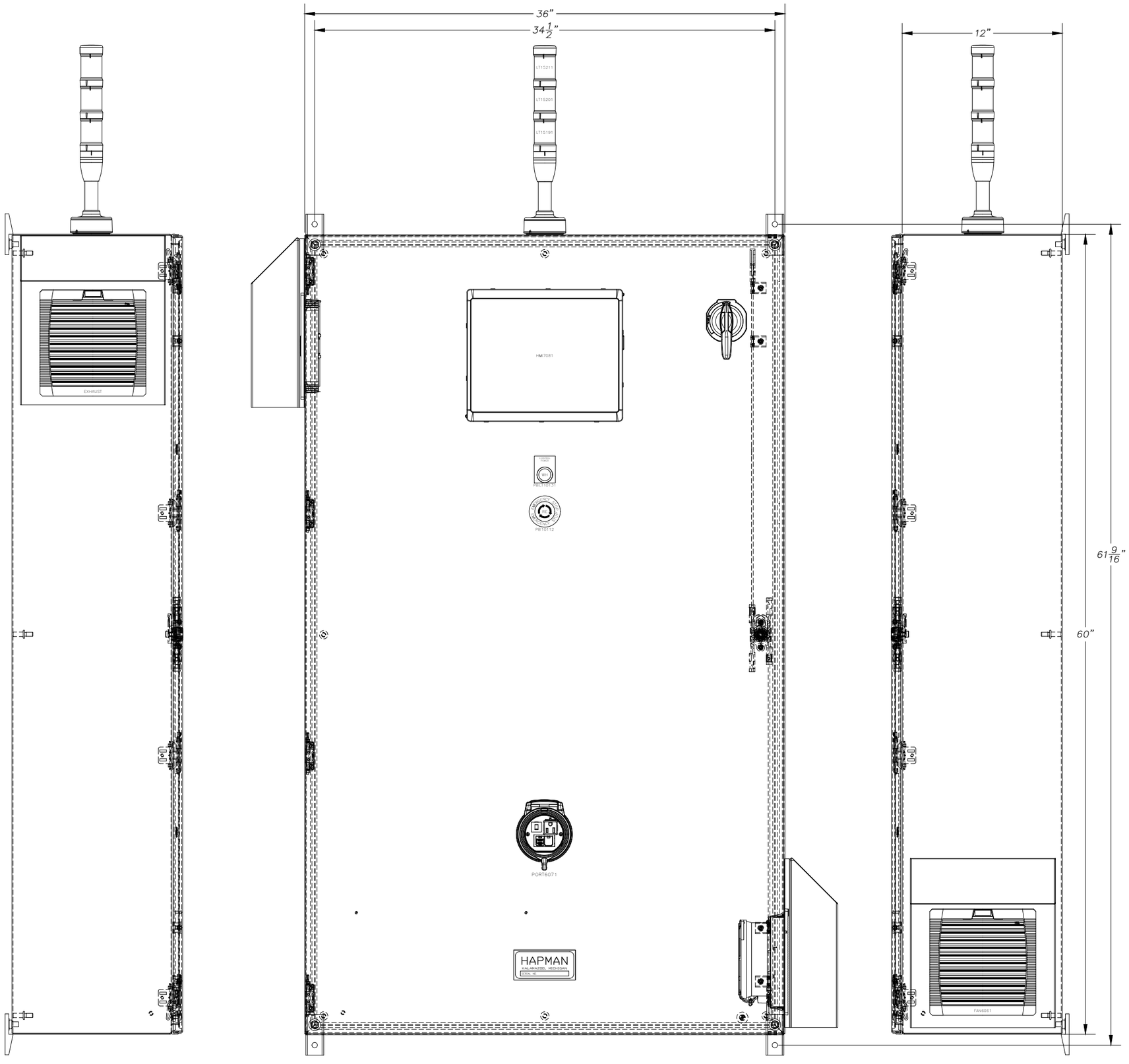
HARDY WIRING DIAGRAM

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
23 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

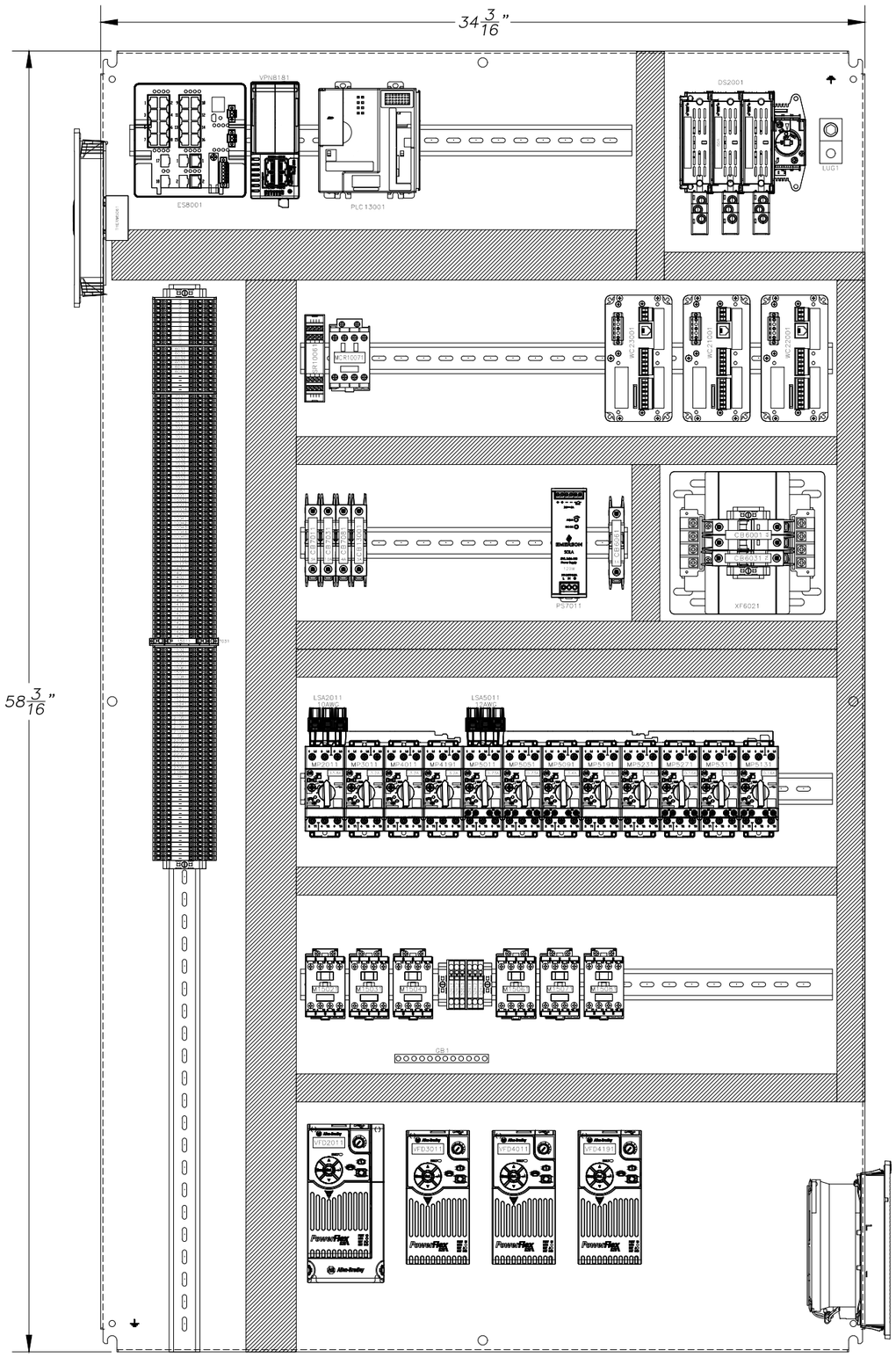
ENCLOSURE LAYOUT

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
24 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



VOLTAGE:	460 VOLT
PHASE & FREQ.:	3PH., 60HZ
FULL LOAD CURRENT:	41 AMP
S.C.C.R.:	10k AMP
ENCLOSURE RATING:	TYPE 4
SCHEMATIC:	H20319DA-B00
MFG. BY:	KMC Global Controls & Automation

HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE:

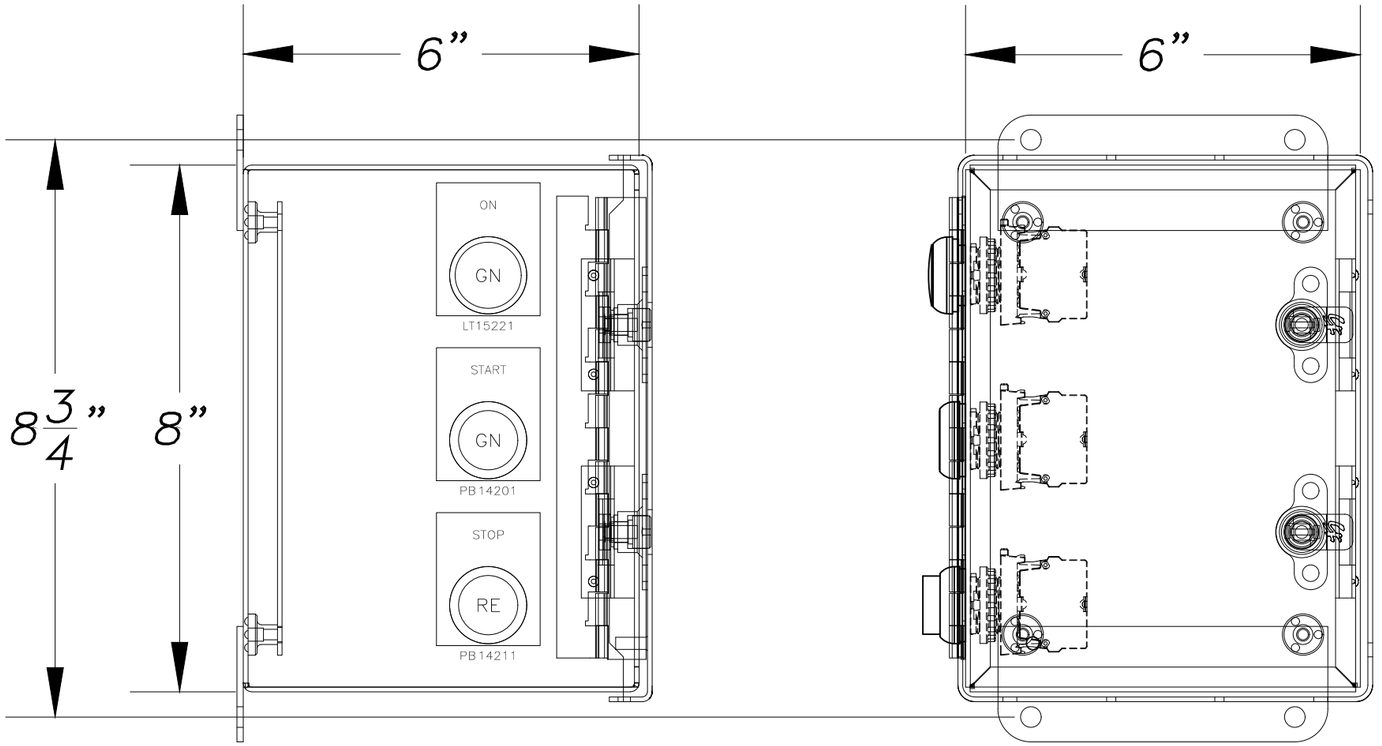
SUB PANEL LAYOUT

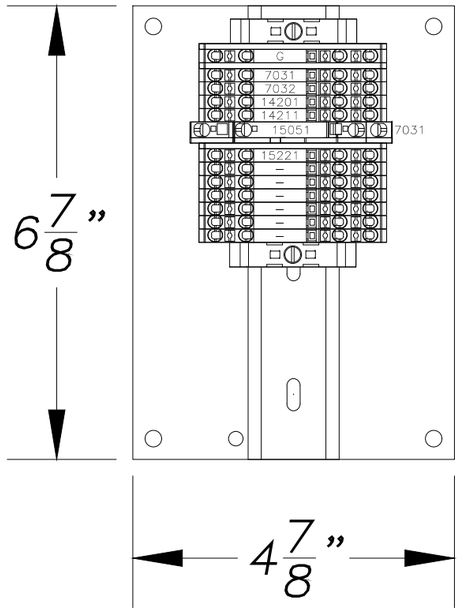
NEMA 4/12 - COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
25 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





DUST COLLECTOR OP STATION	
VOLTAGE:	24VDC
FULL LOAD CURRENT:	1 AMP
ENCLOSURE RATING:	TYPE 4
SCHEMATIC:	H20319DA–B00
MFG. BY:	KMC Global Controls & Automation

HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343–1675 FAX (269) 349–2477

DATE	JOB NO.	DRAWN
4/10/23	H20319–DA, HA & LA	MRL
SCALE N/A		BOM = 1 / DWG = 1

TITLE
DUST COLLECTOR OP STATION LAYOUT
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
26 27	H20319DA–B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

ITEM	QTY	PART #	MANUFACTURE	DESCRIPTION	DESCRIPTOR
1	1	CSD603612	HOFFMAN	60"x36"x12" NEMA 4/12 ENCLOSURE	.
2	1	CP6036G	HOFFMAN	GALVANIZED SUB PANEL	.
3	1	CMFK	HOFFMAN	FOOT KIT	.
4	1	194R-J60-1753-PYS1	AB	60A FUSIBLE ROTARY DISCONNECT KIT 12" SHAFT W/ HANDLE	DS2001
5	3	194R-60-MTL3	AB	LUG, MULTI-TAP 60A 3 POINT 4-14AWG	DS2001
6	3	LPJ-60SP	BUSSMANN	60A CLASS J FUSE	FU2001
7	1	LAMA2/0-14-QY	PANDUIT	LUG	LUG
8	1	140MT-C3E-C16	AB	10-16A MOTOR PROTECTOR	MP2011
9	2	140MT-C3E-B40	AB	2.5-4A MOTOR PROTECTOR	MP3011,4011
10	2	140MT-C3E-B10	AB	0.63-1A MOTOR PROTECTOR	MP5011,5051
11	2	140MT-C3E-B63	AB	4-6.3A MOTOR PROTECTOR	MP5191,5231
12	3	140MT-C3E-A25	AB	0.16-0.25A MOTOR PROTECTOR	MP5271,5311,MP5131
13	2	140MT-C-WTEN	AB	LINE SIDE ADAPTER	MP2011,5011
14	2	140MT-C-W454	AB	4 DEVICE, 3 PHASE COMMONING LINK	MP2011-4191,MP5231-5131
15	1	140MT-C-W455	AB	5 DEVICE, 3 PHASE COMMONING LINK	MP5011-5231
16	6	140MT-C-AFA20	AB	AUX CONTACT, FRONT MOUNT 2 NO	MP5011-5131
17	1	25B-D010N104	AB	10.5A 460V POWERFLEX 525 VFD	VFD2011
18	3	25B-D2P3N104	AB	2.3A 460V POWERFLEX 525 VFD	VFD3011,4011,4191
19	6	100-C09EJ10	AB	9A 24VDC IEC NON-REVERSING CONTACTOR	M15021-15071
20	1	1489-M2C040	AB	2 POLE 4A UL489 CIRCUIT BREAKER, C-CURVE	CB6001
21	1	E500JN	SOLA	500VA CPT	XF6021
22	1	IP20	SOLA	FINGERSAFE TERMINAL COVERS	XF6021
23	1	SBEDIN	SOLA	DIN CIRCUIT BREAKER MOUNTING	XF6021
24	1	1489-M1C070	AB	1 POLE 7A UL489 CIRCUIT BREAKER, C-CURVE	CB6031
25	1	1489-M1C010	AB	1 POLE 1A UL489 CIRCUIT BREAKER, C-CURVE	CB6061
26	1	17121000010	PFANNENBERG	FLZ 530 THERMOSTAT W/ N.O. SPRING CONTACT	THERM6061
27	1	11633156055	PFANNENBERG	120V 152 CFM PF33000 SL TYPE 12 FILTERFAN	FAN6061
28	1	11730004055	PFANNENBERG	PFA 30000 TYPE 12 EXHAUST FILTER	EXHAUST
29	2	18182000012	PFANNENBERG	FILTERFAN RAINHOOD TYPE 4	FAN6061,EXHAUST
30	1	DAP3BC-S3-6	PANDUIT	PROG. PORT, SIMPLEX OUTLET, RJ45, 3A CB	PORT6071
31	1	1489-M1C030	AB	1 POLE 3A UL489 CIRCUIT BREAKER, C-CURVE	CB7011
32	1	SVL 5-24-100	SOLA	24VDC 120W POWER SUPPLY	PS7011
33	1	1489-M1C050	AB	1 POLE 5A UL489 CIRCUIT BREAKER, C-CURVE	CB7031
34	1	1489-M1C040	AB	1 POLE 4A UL489 CIRCUIT BREAKER, C-CURVE	CB7081
35	1	2711P-T10C21D8S	AB	PANELVIEW PLUS 7 10" STANDARD COLOR TOUCHSCREEN HMI	HMI7081
36	1	1783-BMS20CGL	AB	20 PORT 5700 LITE MANAGED ETHERNET SWITCH	ES8001
37	3	576-S10-007	QUIKTRON	7' SHIELDED CAT5E ETHERNET CABLE	ENET-8021-8031
38	4	576-S10-010	QUIKTRON	10' SHIELDED CAT5E ETHERNET CABLE	ENET-8032,8041
39	1	576-S10-002	QUIKTRON	2' SHIELDED CAT5E ETHERNET CABLE	ENET-8042
40	1	576-S10-003	QUIKTRON	3' SHIELDED CAT5E ETHERNET CABLE	ENET-8051
41	2	576-S10-005	QUIKTRON	5' SHIELDED CAT5E ETHERNET CABLE	ENET-8052,8061
42	1	FLEXY20500_MA	EWON	FLEXY 205 INDUSTRIAL INTERNET ROUTER	VPN8181
43	1	440R-N23126	AB	24VDC MSR127T SAFETY RELAY	SR10061
44	1	700-CF400EJ	AB	24VDC IEC CONTROL RELAY W/ 4 N.O. CONTACTS	MCR10071
45	1	100-FA40	AB	4 N.O. AUX FRONT MOUNT CONTACT BLOCK	MCR10071
46	1	800FP-MT44PX02	AB	22mm RED EMERGENCY STOP PB W/ 2 N.C. CONTACTS	PB10112
47	1	CT-22ESTOP	CT	22mm LEGEND - EMERGENCY STOP	PB10112
48	1	800FP-LF7PN3WX10	AB	22mm 12-30VAC/DC WHITE ILLUM. FLUSH HEAD PB W/ 1 N.O. CONTACT	PBLT10131
49	1	CT-22CONTROL/POWER	CT	22mm LEGEND - CONTROL/POWER	PBLT10131
50	1	1489-M1C030	AB	1 POLE 3A UL489 CIRCUIT BREAKER, C-CURVE	CB13001
51	1	1769-L24ER-QB1B	AB	COMPACTLOGIX 5370 L2 CONTROLLER	PLC13001
52	1	854J-BQ10C	AB	STACK LIGHT BASE W/ 100mm TUBE	LT15191-15211
53	1	854J-24TL3	AB	24VAC/VDC GREEN LED STACK LIGHT	LT15191
54	1	854J-24TL8	AB	24VAC/VDC YELLOW LED STACK LIGHT	LT15201
55	1	854J-24TL4	AB	24VAC/VDC RED LED STACK LIGHT	LT15211
56	1	1492-LD4DR	AB	DOUBLE STACK DIODE TERMINAL	D15011
57	1	1492-EBLD4	AB	END PLATE FOR DOUBLE STACK DIODE TERMINAL	D15011

ITEM	QTY	PART #	MANUFACTURE	DESCRIPTION	DESCRIPTOR
58	3	HI-4050-DR-DC-EIP	HARDY	WEIGHT CONTROLLER	WC21001-23001
59	6	3211757	PHOENIX	6.2mm 30A PUSH IN TERMINAL	.
60	2	3030420	PHOENIX	END COVER FOR 6.2mm PUSH IN TERMINAL	.
61	110	1492-P3Q	AB	5.1mm 4-WIRE PUSH IN TERMINAL	.
62	12	1492-PG3Q	AB	5.1mm 4-WIRE PUSH IN GROUND TERMINAL	.
63	5	1492-EBP3Q	AB	END PLATE FOR 5.1mm 4 WIRE PUSH IN TERMINAL	.
64	6	0800886	PHOENIX	SCREW ON END STOP	.
65	7'	F2X4LG6	PANDUIT	2"x4" LIGHT GRAY WIREWAY	.
66	7'	C2LG6	PANDUIT	2" LIGHT GRAY WIREWAY COVER	.
67	12.5'	F1X4LG6	PANDUIT	1"x4" LIGHT GRAY WIREWAY	.
68	12.5'	C1LG6	PANDUIT	1" LIGHT GRAY WIREWAY COVER	.
69	13'	111023	E-RAIL	35mm DIN RAIL	.
70	1	GBK10	EATON	10 POINT GROUND BAR	GB1
71					
72					
73	1	A8066CHFL	HOFFMAN	8"x6"x6" NEMA 4/12 ENCLOSURE	DUST COLLECTOR OP STATION
74	1	A8P6G	HOFFMAN	GALVANIZED SUB PANEL	.
75	1	800FP-F3PX10	AB	22mm GREEN FLUSH HEAD PB W/ 1 N.O. CONTACT	PB14021
76	1	CT-22START	CT	22mm LEGEND - START	PB14021
77	1	800FP-E4PX01	AB	22mm RED EXTENDED HEAD PB W/ 1 N.C. CONTACT	PB14211
78	1	CT-22STOP	CT	22mm LEGEND - STOP	PB14211
79	1	800FP-P3PN3G	AB	22mm 24VDC GREEN LED PILOT LIGHT	LT15221
80	1	CT-22ON	CT	22mm LEGEND - ON	LT15221
81	1	1492-LD4DR	AB	DOUBLE STACK DIODE TERMINAL	D15051
82	1	1492-EBLD4	AB	END PLATE FOR DOUBLE STACK DIODE TERMINAL	D15051
83	12	1492-P3Q	AB	5.1mm PUSH IN 20A 2 CONNECTIONS PER SIDE	.
84	2	1492-EBP3Q	AB	END PLATE FOR 5.1mm PUSH IN TERMINAL	.
85	2	0800886	PHOENIX	SCREW ON END STOP	.
86	1'	111023	E-RAIL	35mm DIN RAIL	.
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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE	4/10/23	JOB NO.	H20319-DA, HA & LA	DRAWN	MRL
SCALE	N/A			BOM = 1	DWG = 1

TITLE

BILL OF MATERIALS

NEMA 4/12 - COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
27	27	H20319DA-B00	0.3

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 Corporation Contact Person: Dan Elsasser

Tel: (605) 453 – 1183

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

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

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

Description of Machinery:
It is used for a unique manufacturing process at entity's location above. Industrial Machinery: Hapman H20319DA-B00 with KMC GLOBAL CONTROLS & AUTOMATION control panels.
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 October 2024.

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

Please answer the following questions:

[ ]Yes [X]No: The machinery as a packaged unit is available in a listed form.

[ ]Yes [X]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)

[X]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.

[X]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.

[X]Yes [ ]No: In the opinion of the Entity the machinery complies with NEC 670.

[X]Yes [ ]No: Entity accepts responsibility and liability for the machinery.

[X]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: Dan Elsasser Position: Manufacturing Engineering Manager

SIGNATURE

02 / 05 / 2025
DATE

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

Ensure your application includes:

[X] Signature and Date
[X] Attach Stamped Engineering plans

Muth Power Solutions

Field Evaluated

Equipment MFGR: KMC Global, Hapman

Industrial Machinery: H20319DA-B00

Field Label No.: MPS-FEB-060002

To Verify Label, Call (605)-996-3983

Industrial Machinery Field Evaluated to UL Standards, NFPA 79 and NFPA 70 Article 670. A Report Supplements this Label and Details the Evaluation

Evaluation Date: 10/10/2024

REGISTERED PROFESSIONAL ENGINEER
NUMBER 16721
JOSHUA JAY KNIGHTON
SOUTH DAKOTA
10/25/24

Field Evaluation of Non-Listed Industrial Machinery
MPS-FEB-060002

Industrial Machinery: H20319DA-B00
Control Panels by: KMC GLOBAL CONTROLS & AUTOMATION
Industrial Machinery by: Hapman

Henkel
600 E Willow St
Minnehaha County, South Dakota

Revision	Description	Date
1.0	Initial Release	10/25/2024

Muth Power Solutions

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

Summary:

H20319DA-B00-2 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 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-060002**. 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)

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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: **480 VOLT**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **41 Amps**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **5 HP**
- Electrical Drawing Number: **H20319DA-B00**

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 result of the summation equation above puts the FLA at approximately 41-43 Amps & 125% of that is 51.25A-53.75A. The supply conductors are #2 AWG Copper and are rated for 115A @ 75 Deg C.

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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

Largest Motor							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Conveyor Motor (Top of Bin)	5	7.85	460	3	0.8	0.886	8.82

Other Loads							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
BBU Rotary Valve #1	1	2.04	460	3	0.7	0.95	2.44
BBU Rotary Valve #2	1	2.04	460	3	0.7	0.95	2.44
Dump Rotary Valve	1	2.04	460	3	0.7	0.95	2.44
Bulk Bag Vibrator Motor #1	-	0.16	460	3	0.88	0.9	0.16
Bulk Bag Vibrator Motor #2	-	0.16	460	3	0.88	0.9	0.16
Dump Station Vibrator Motor	-	0.16	460	3	0.88	0.9	0.16
Trolley/Hoist Motor #1	2.4	4.5	460	3	0.88	0.9	4.53
Trolley/Hoist Motor #2	2.4	4.5	460	3	0.88	0.9	4.53
Enclosure 120V Loads	-	0	0	0	0	0	0.50
Dust Collector	2	3.4	460	3	0.88	0.9	3.42
Chain Hammer Motor #1	0.3	0.73	460	3	0.88	0.9	0.73
Chain Hammer Motor #2	0.3	0.73	460	3	0.88	0.9	0.73
Chain Hammer Motor #3	0.3	0.73	460	3	0.88	0.9	0.73

Supply Conductor Rating @ 75 Deg C (#2 Copper)
115

Calculated Amps (1.25 (heat + large motor) + Other Loads)
42.70

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 enclosure has a single Allen Bradley disconnect that has integral, 60A fuses

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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 enclosure is supplied from a 60A ABB breaker. It is equipped with an AB main disconnect that has integral Class J, 60A fuses (Bussmann LPJ-60SP). The overcurrent calculation above showed that 60A is appropriate overcurrent 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.

- Supply conductors = #2 AWG Copper and ~ 150' length. The approximated fault current from SWBD-2 down to this control panel was less than 10 kA. With a SCCR rating of 10 kAIC, the panel is compliant

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 = √3 x L x I n x C x E	Total Available Fault Current Itot=Isc+Isy m(mot.cont.)	Tra
CT-1	10	55,789	COPPER	500 MCM	NON-MAGNETIC	26706	480	8	0.01	**55268**	
SWBD-2	55	55,268	COPPER	500 MCM	NON-MAGNETIC	26706	480	8	0.05	**52569**	
Hapman 1	150	52,569	COPPER	2 AWG	STEEL	5906	480	1	4.82	**9036**	
Hapman 2	150	52,569	COPPER	2 AWG	STEEL	5906	480	1	4.82	**9036**	
Hapman 3	150	52,569	COPPER	2 AWG	STEEL	5906	480	1	4.82	**9036**	

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 switchboard that feeds this enclosure has adequate surge protection for AC conductors.

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

NFPA 70, Article 670 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Issues 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)

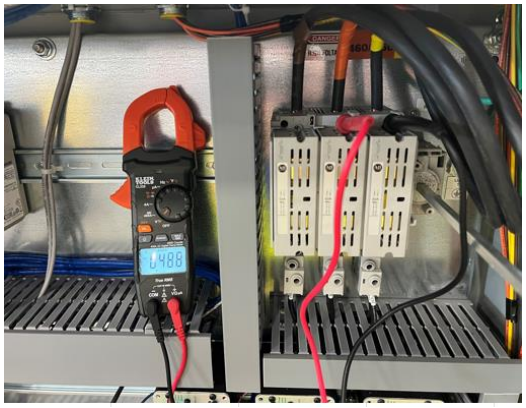
Construction Requirements of NFPA 79:

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 machinery is rated for 480V. It was observed to be operating approximately at 488V line-to-line for AB, BC, and CA phases. This is within the acceptable voltage range. There were not any Line-Neutral loads of 277V present in this enclosure. A 500VA control transformer steps the voltage down to 120V for control voltage, convenience receptacle in enclosure, and feed to 24VDC power supply.

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024



Environmental

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

- The machinery is installed in an industrial manufacturing environment. It's possible for the enclosure to be exposed to powder product. The enclosure is rated adequately for NEMA 3R, 12, 4 environments

- It is in a temperature-controlled environment within an insulated building. The machinery's operating temperature was approximately 70-71 Deg F within the enclosure. Ambient temperature was observed to be around 69 Deg F within the building.

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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 above section. As approximated above, the maximum fault current to this enclosure is less than 10 kAIC, so the panel's 10 kAIC SCCR is appropriate.

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 above section. The enclosure has a single Allen Bradley disconnect that has integral, 60A fuses. It disconnects all of the electrical equipment connected to the industrial control panel and 60A rating is greater than 115% of FLA.

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.

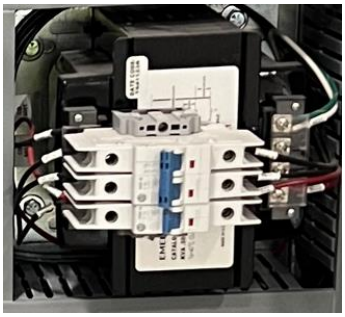
- The enclosure The enclosure has a single Allen Bradley disconnect that has integral, 60A fuses. It disconnects all of the electrical equipment connected to the industrial control panel. All parts are guarded that are greater than 50VAC / 60 VDC. An arc flash warning placard is placed near the disconnecting means.

Protection of Equipment

The system has the following protection for the equipment

- Overcurrent
  - Supply Feeder #2 CU: 60A fuses (Bussmann LPJ-60SP)
  - Control XFMR
    - Primary of 500 VA control XFMR : Allen Bradley 1489-M 2P Breaker (4A)
    - Secondary of 500 VA control XFMR : Allen Bradley 1489-M 1P Breaker (7A)

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

- Other Loads in Enclosure
  - Enclosure Fan & Receptacle (120VAC): Allen Bradley 1489-M 1P Breaker (3A)
  - Power Supply (120VAC): Allen Bradley 1489-M 1P Breaker (1A)
  - DC Power (24VDC): Allen Bradley 1489-M 1P Breaker (5A)
  - DC Power (24VDC): Allen Bradley 1489-M 1P Breaker (4A), Terminal Jumper
  - DC Power (24VDC): Allen Bradley 1489-M 1P Breaker (3A), Terminal Jumper
  - 24VDC Devices
    - Hardy Weight Controllers (3 Total)
    - Allen Bradley Safety Relay Power (1 Total)
    - Allen Bradley Panelview HMI (1 Total)
    - Allen Bradley Stratix 5700 (1 Total)
    - Allen Bradley CompactLogix L24ER QB1B (1 Total)
    - Bulk Bag Bar Grate SensaGuard (2 Total)
    - Solimar (1 Total)



- Motor Protection (12 Total)
  - Each motor circuit is protected with Allen Bradley 140MT-C3E Class 10 motor circuit protector which has integral overload protection via thermal trip. This MCP accounts for motor inrush & allows the system to operate as intended. The 140MT-C3E has a short circuit rating of at least 65 kAIC at 480V and is rated as motor disconnect.
    - Conveyor Motor (FLA 6.5A) - Observed Trip Setting on MCP: **13.8A**
    - Inlet Rotary Valve #1 Motor (FLA 1.6A) - Observed Trip Setting on MCP: **3.2A**
    - Inlet Rotary Valve #2 Motor (FLA 1.6A) - Observed Trip Setting on MCP: **3.2A**

Field Evaluation Number: MPS-FEB-060002 Industrial Machine: H20319DA-B00 Date: 10/25/2024

- Dump Inlet Rotary Valve Motor (FLA 1.6A) - Observed Trip Setting on MCP: **3.2A**
- Chain Hammer #1 Motor (FLA 0.73A) - Observed Trip Setting on MCP: **0.73A**
- Carryover Chain Hammer Motor (FLA 0.73A) - Observed Trip Setting on MCP: **0.73A**
- Dust Collector Blower Motor (FLA 3.4A) - Observed Trip Setting on MCP: **3.4A**
- Hoist & Trolley #1 Motor (FLA 5.8A) - Observed Trip Setting on MCP: **5.9A**
- Hoist & Trolley #2 Motor (FLA 5.8A) - Observed Trip Setting on MCP: **5.9A**
- Dump Station Vibrator Motor (FLA 0.16A) - Observed Trip Setting on MCP: **0.16A**
- BBU #1 Vibrator Motor (FLA 0.16A) - Observed Trip Setting on MCP: **0.16A**
- BBU #2 Vibrator Motor (FLA 0.16A) - Observed Trip Setting on MCP: **0.16A**

Bulletin No.	**140MT-C**
Frame Size	C-Frame
Max. Current I_e	32 A
Current Rating	0.1...32 A
Short-circuit protection	✓
Standard magnetic trip	✓
High magnetic trip	–
Magnetic-only trip (Motor Circuit Protector [MCP])	–
Overload protection	✓
Trip Class	10
Phase loss sensitivity	✓
Short-circuit Indication	✓
Variable-frequency Drive (VFD) downstream compatible	–
UL 60947-4-1 Application Ratings:	
Motor Disconnect	✓ (see ratings)
Group Installation	✓ (see ratings)
Tap Conductor Protection	✓ (see ratings)
Manual, Self Protected (Type E)	✓ (see ratings)
Type F ratings with 100-C and 100-E Contactors	✓ (see ratings)

- Overvoltage Protection – Safety Circuit
  - NFPA 79 requires the safety signals have surge/overvoltage protection. The safety relay is powered from 24VDC & the 120VAC to 24VDC power supply has built-in surge/over voltage protection (Emerson SOLA SVL 5-24-100) that is latching. The signals from the safety relay to the VFDs are also 24VDC

	Protections	
Overvoltage Protection	16-18.7 V, Latching	30-34.8 V, Latching
Overload Protection	Current foldforward and then hiccup	
Over Temperature Protection	No Component Damage, Latch Mode	
Short Circuit	Hiccup Mode, Non-Latching (Auto-Recovery when the fault is removed)	
Power Factor Correction	Meets EN61000-3-2 Class A	

Grounding & Bonding

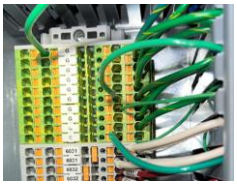
The system shall be installed in accordance with NFPA 70, Article 250 for grounding & bonding. The equipment grounding conductor must be identified with the word “GROUND” or be identified with the GND symbol.

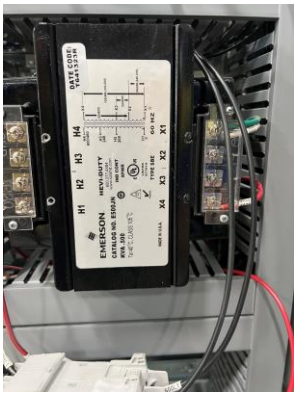
Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

- Main Ground Lug for supply conductors is identified with the symbol and conductor has green colored insulation. Each electrical equipment within the enclosure is properly bonded to ground & has a dedicated termination for the equipment grounding conductor (solid green or with a green/yellow stripe) that's sized in compliance with NFPA 70, Article 250.122 for the upstream overcurrent protection trip threshold. The control XFMR is bonded on the secondary & case. Each VFD is bonded appropriately for the connected motor. Enclosure's doors had a separate bonding jumper to ensure continuity was maintained at all times.







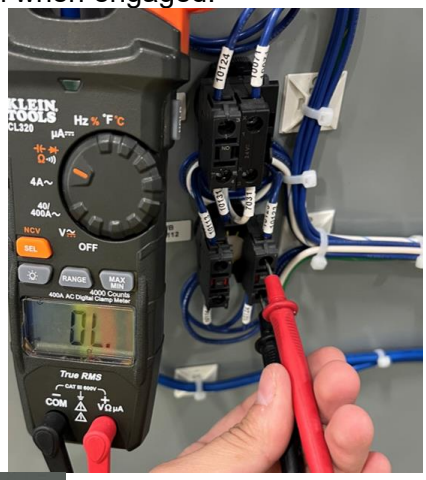




Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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 enclosure is equipped with an Allen Bradley safety relay that interlocks the (4) VFDs. There is also an emergency stop button that's compliant with NFPA 79's standards; the components were tested to ensure it interrupted the system when engaged.



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)

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

- **Push-Button for Resets** (Blue, but Black, White, Gray, and RED if stop/emergency reset)
- **Mandatory Conditions** (Blue)
- **Neutral Conditions** (White)

  - There is an emergency stop button on the PLC enclosure and the dust collector operator interface is within 10' of the main enclosure. The dust collector has a local start (GREEN), stop (RED), and on (GREEN) push-buttons. There is a stack light with red, green, and yellow. These interfaces are compliant with NFPA 79's recommended color code for the associated control function.



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.


Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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.

- Supply conductors / raceways were observed to be compliant during the evaluation. Exposed conductors were observed to be copper and sized appropriately for the connected loads. It appeared that the installation followed UL508a's recommended color codes for voltages, AC/DC loads, and grounded/ungrounded. Insulation was observed to be rated for 600V. Conductors with differing voltages were ran in separate raceways/Panduit where possible.
  - Supply Conductors - #2 AWG CU
  - Control XFMR Conductors - #14 AWG CU
  - Fan Thermostat Conductors - #16 AWG CU
  - Motor Conductors - #12 AWG CU
  - DC Conductors - #14 AWG CU
  - 120VAC Conductors - #14 AWG 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.

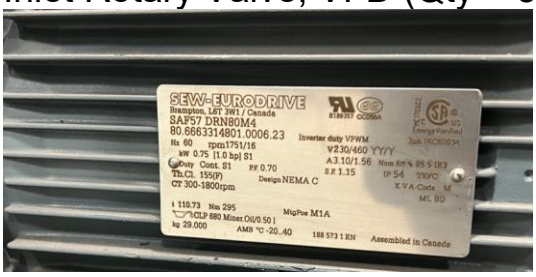
Electric Motors and Associated Equipment

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 were installed in compliance with manufacturer & matched provided design drawings; they're accessible and future maintenance will be able to be done for each motor. Each motor had a starter (VFD or across the line) that were sized appropriately for the connected motor. All components were listed and intended for use with the motors. Nameplate data was similar to the design drawings.

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

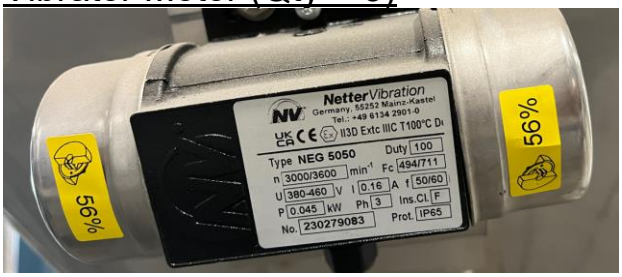
Inlet Rotary Valve, VFD (Qty = 3)



Conveyor Motor, VFD (Qty = 1)

Trolley / Hoist Motors (Qty = 2)

Vibrator Motor (Qty = 3)



Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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*
  - The label was placed visibly on Enclosure since Voltage was greater than 50VAC or 60VDC

- Nameplate - See above section for picture with information below
  - 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

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.

- Industrial machinery has drawings within enclosure & is numbered H20319DA-B00

NFPA 79 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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

October 25, 2024

Date:

Joshua J. Knighton
Professional Engineer

Field Evaluation Number: MPS-FEB-060002 **Industrial Machine: H20319DA-B00** **Date:** 10/25/2024

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**	**Observation**	**Corrective Action Required**
-	-	Cables for VFD are ran THHN and installed in conduit with non-VFD cables. It was also noted that load wiring from the VFD was not shielded VFD cabling & there was not a reactor installed for the VFD	No - These are just observations in case issues arise in the future with EMI or harmonics. It's not likely since these are small motors.
-	-	Hoist/Trolley molded cables freely dangle down to the hoist control interface without any tie down. There are not any obvious ways this cable can be damaged as-is	No – I don't know if there's a good way to anchor this cable, but it may be worth having signage that reminds an operator to check that the cable isn't hung up on any equipment before any recipe is started

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

IP ADDRESS:
192.168.200.105

HMI7081

IP ADDRESS:
192.168.200.90

VPN8181

IP ADDRESS:
192.168.200.100

PLC 13001

BULK BAG #1 HARDY
IP ADDRESS:
192.168.200.120

WC21001

BULK BAG #2 HARDY
IP ADDRESS:
192.168.200.121

WC22001

DUMP STATION HARDY
IP ADDRESS:
192.168.200.122

WC22001

ENET–8042

ENET–8051

ENET–8052

ENET–8061

ENET–8071

ENET–8041

IP: 192.168.200.101
SUBNET: 255.255.255.0
GW: 0.0.0.0

PORT 8
PORT 7
PORT 6
PORT 5
PORT 4
PORT 1
PORT 2
PORT 3
PORT 9
PORT 10
PORT 11
PORT 12
PORT 13
PORT 14
PORT 15
PORT 16

ES8001

ENET–8032

PORT6071

ENET–8021

ENET–8022

ENET–8031

ENET–8062

VFD2011

TUBULAR CONVEYOR
IP ADDRESS:
192.168.200.110

VFD3011

INLET ROTARY
VALVE #1
IP ADDRESS:
192.168.200.111

VFD4011

INLET ROTARY
VALVE #2
IP ADDRESS:
192.168.200.112

VFD4191

DUMPER STATION INLET
ROTARY VALVE
IP ADDRESS:
192.168.200.113

HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343–1675 FAX (269) 349–2477

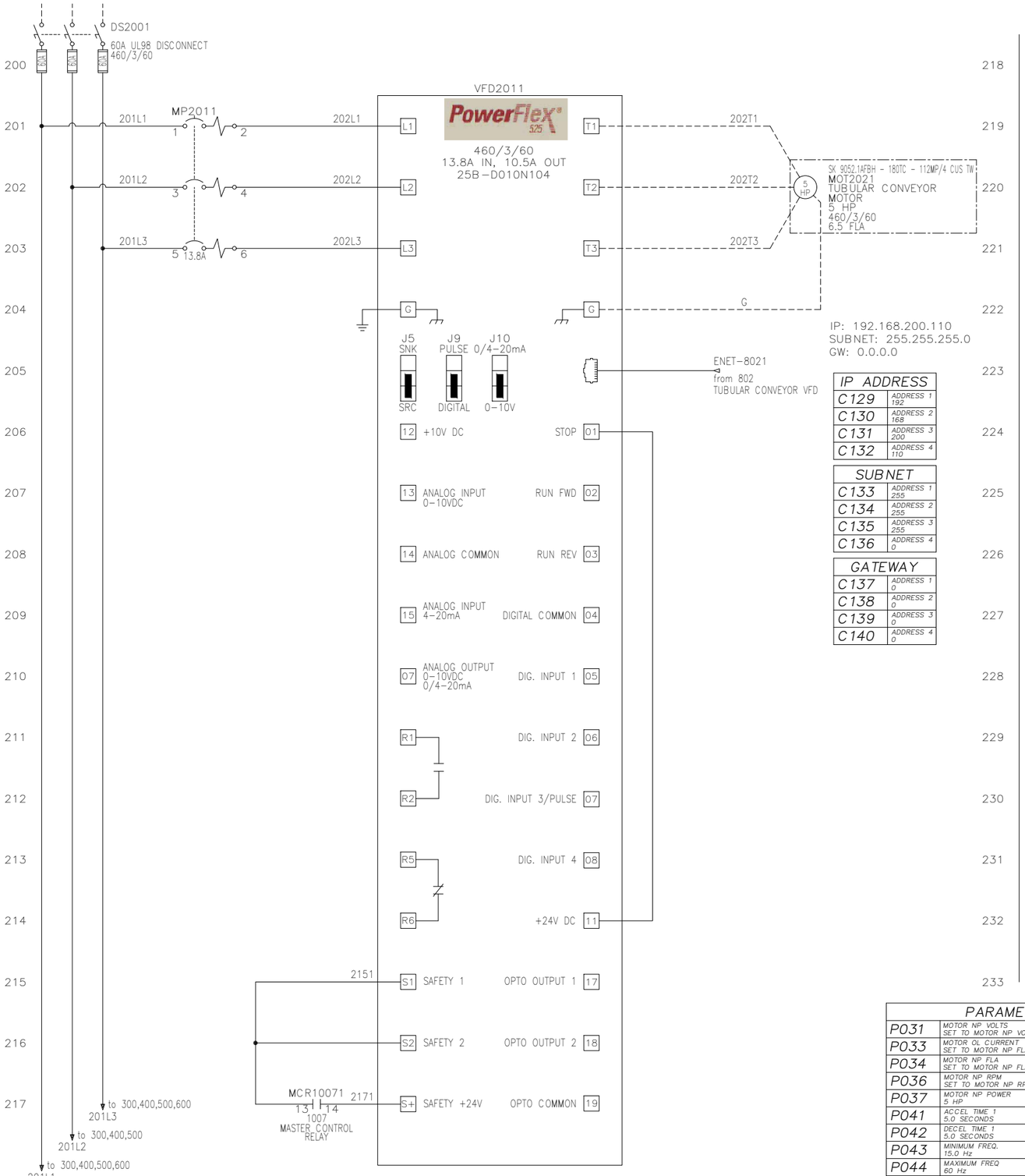
DATE 4/10/23	JOB NO. H20319–DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
NETWORK WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
1	27	H20319DA–B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



IP ADDRESS	
C129	ADDRESS 1 192
C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 110

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P031	MOTOR NP VOLTS SET TO MOTOR NP VOLTS
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P036	MOTOR NP RPM SET TO MOTOR NP RPM
P037	MOTOR NP POWER 5 HP
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15.0 Hz
P044	MAXIMUM FREQ 60 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP
t070	OPTO OUT1 LEVEL 52%

PARAMETER SETTINGS	
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETYFLT RSTCFG 1 – FLTCLR RESET
A431	JOG FREQUENCY 15.0 Hz
A432	JOG ACCEL/DECEL 5.0 SECONDS
A486	SHEAR PIN1 LEVEL 5.5A
A487	SHEAR PIN 1 TIME 0.10s
A490	LOAD LOSS LEVEL HAPMAN TO SET TO DESIRED LEVEL
A491	LOAD LOSS TIME 1.0s
C128	EN ADDR SEL 1 – PARAMETERS
—	– –
—	– –
—	– –
—	– –

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DATE	4/10/23	JOB NO.	H20319-DA, HA & LA	DRAWN	MRL
SCALE	N/A			BOM = 1	DWG = 1

TITLE
MOTOR WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
2	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
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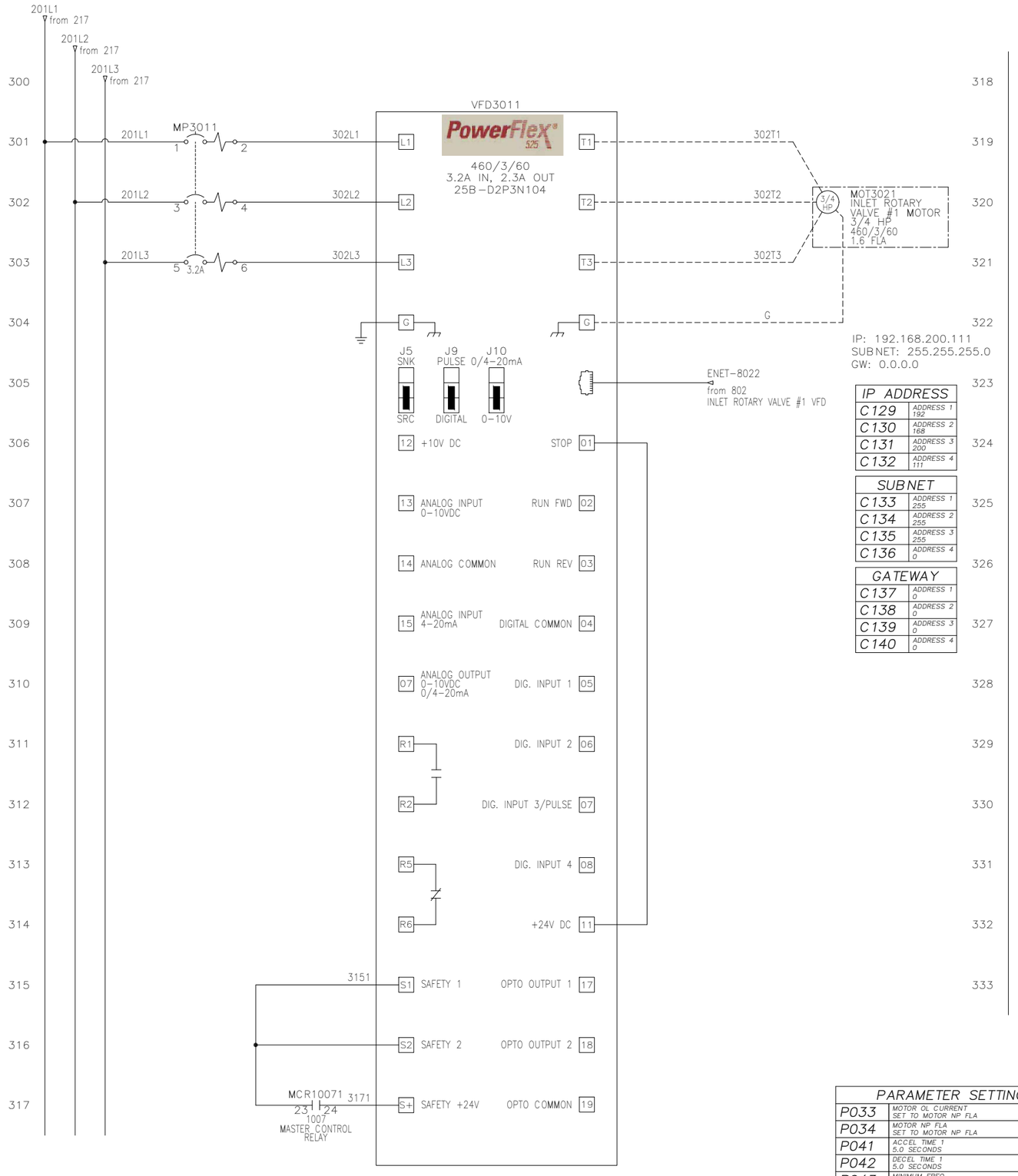

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SUBNET: 255.255.255.0
GW: 0.0.0.0

IP ADDRESS	
C129	ADDRESS 1 192
C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 111

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP

PARAMETER SETTINGS	
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETY FAULT RESET 1 – FAULT CLEAR RESET
C128	EN ADDR SEL 1 – PARAMETERS
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–	– –
–	– –

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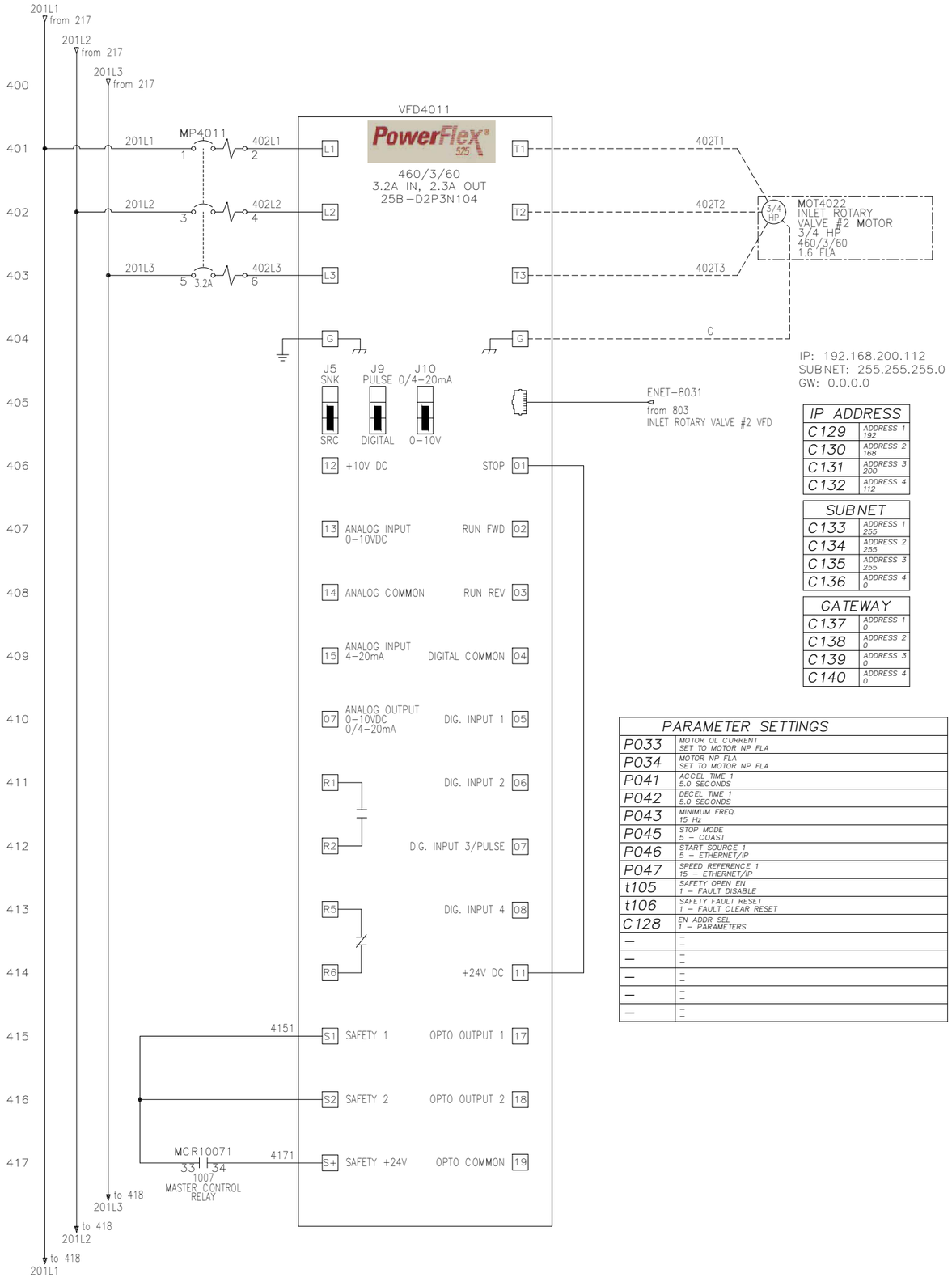
DATE	4/10/23	JOB NO.	H20319-DA, HA & LA	DRAWN	MRL
SCALE	N/A			BOM = 1	DWG = 1

TITLE
MOTOR WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
3	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



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IP ADDRESS	
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C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 112

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETY FAULT RESET 1 – FAULT CLEAR RESET
C128	EN ADDR SEL 1 – PARAMETERS
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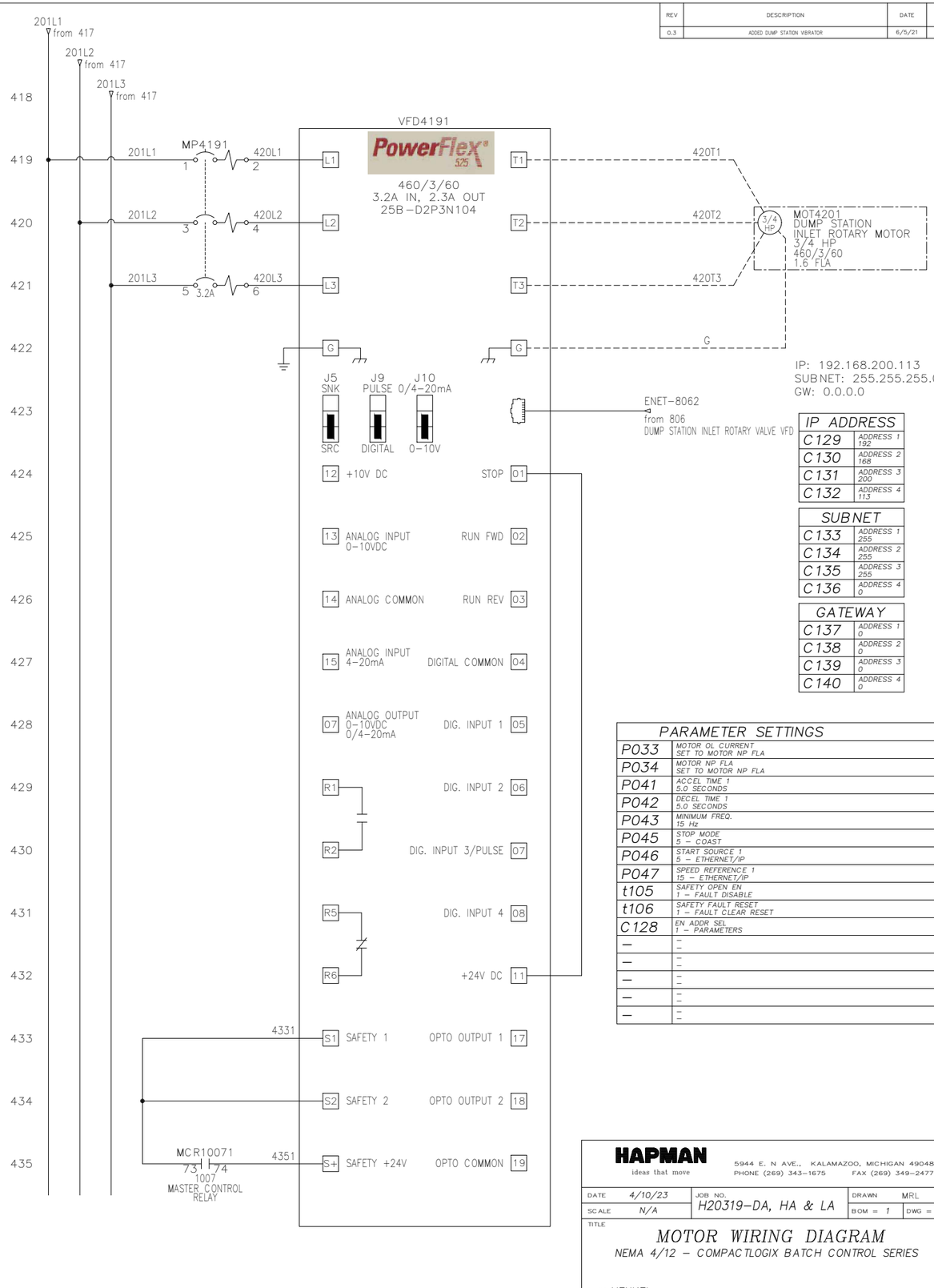
–	– –
–	– –
–	– –



IP: 192.168.200.113
SUBNET: 255.255.255.0
GW: 0.0.0.0

IP ADDRESS	
C129	ADDRESS 1 192
C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 113

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETY FAULT RESET 1 – FAULT CLEAR RESET
C128	EN ADDR SEL 1 – PARAMETERS
–	– –
–	– –
–	– –
–	– –
–	– –

HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

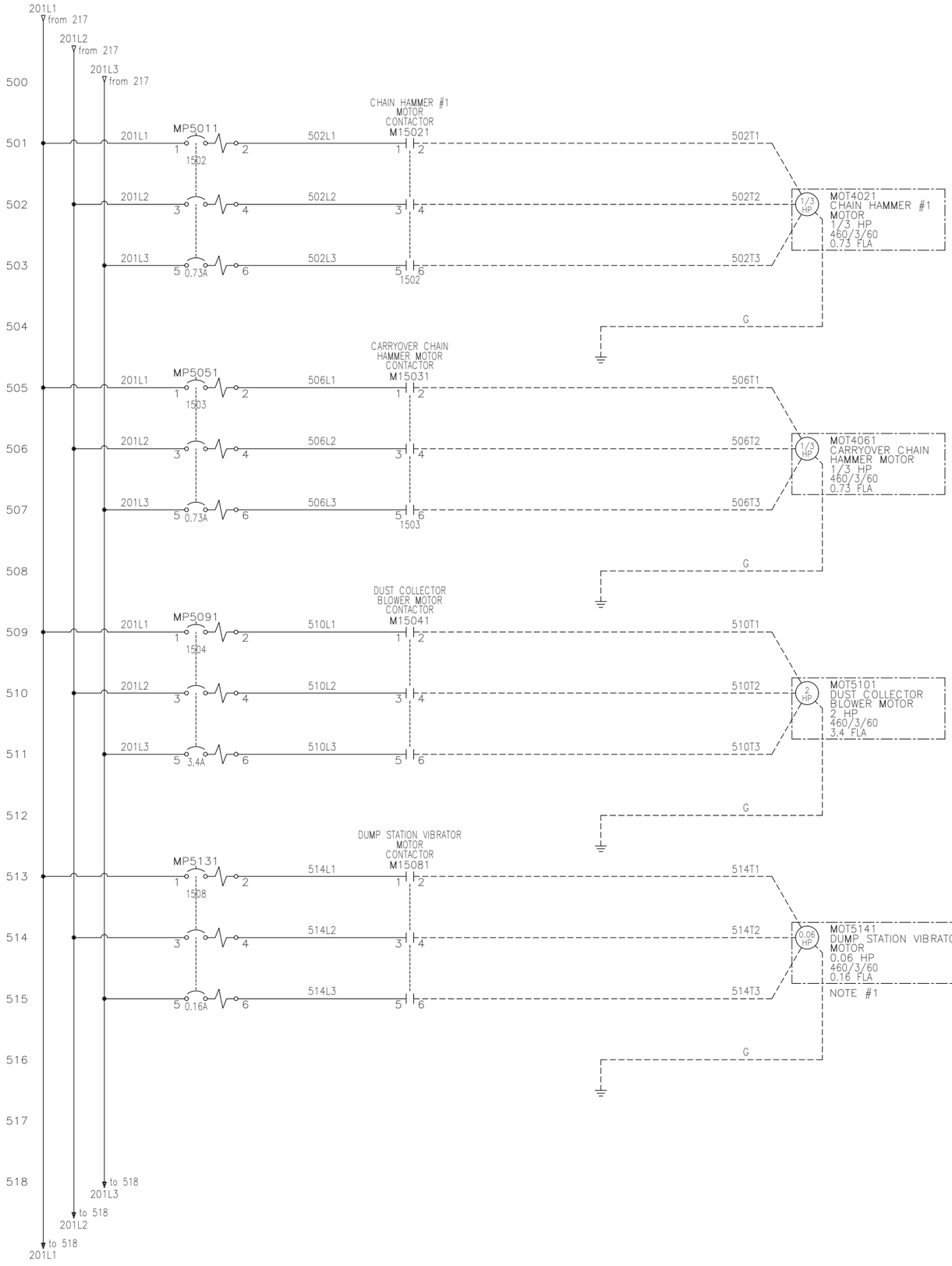
DATE	4/10/23	JOB NO.	H20319-DA, HA & LA	DRAWN	MRL
SCALE	N/A			BOM = 1	DWG = 1

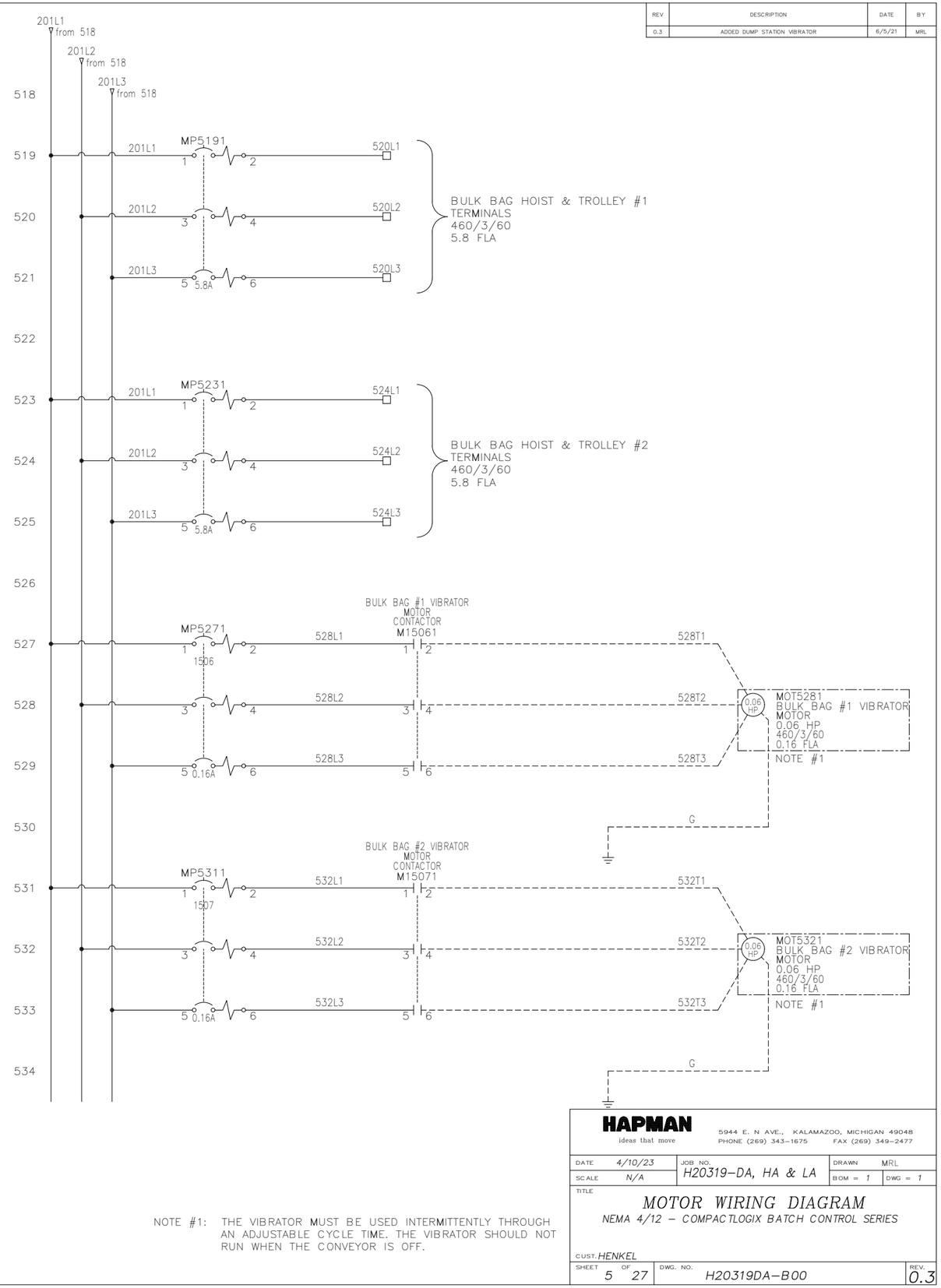
TITLE
MOTOR WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
4	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





NOTE #1: THE VIBRATOR MUST BE USED INTERMITTENTLY THROUGH AN ADJUSTABLE CYCLE TIME. THE VIBRATOR SHOULD NOT RUN WHEN THE CONVEYOR IS OFF.

HAPMAN
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5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE	JOB NO.	DRAWN
4/10/23	H20319-DA, HA & LA	MRL
SCALE N/A		BOM = 1 / DWG = 1

TITLE

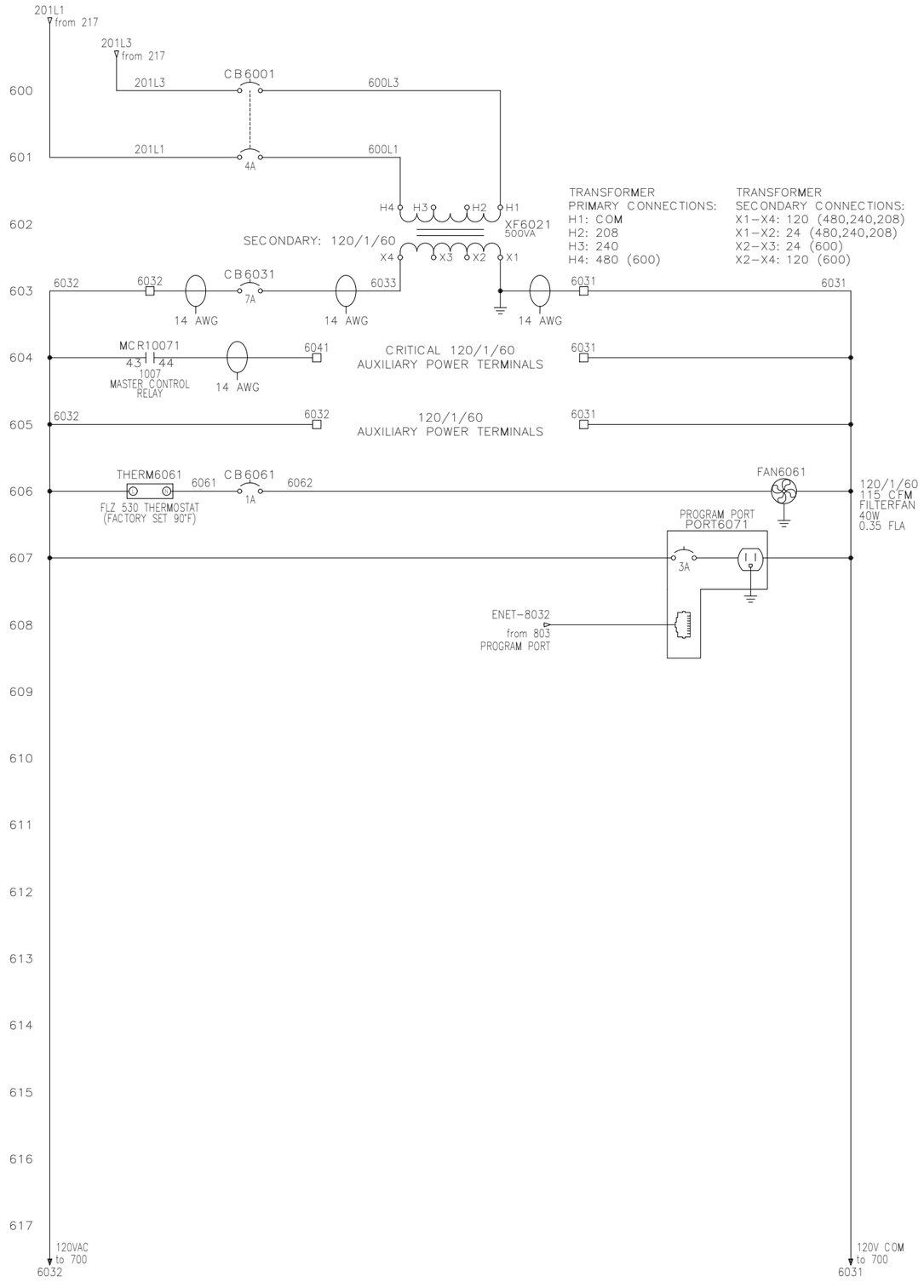
MOTOR WIRING DIAGRAM

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
5	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343–1675 FAX (269) 349–2477

DATE 4/10/23	JOB NO. H20319–DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

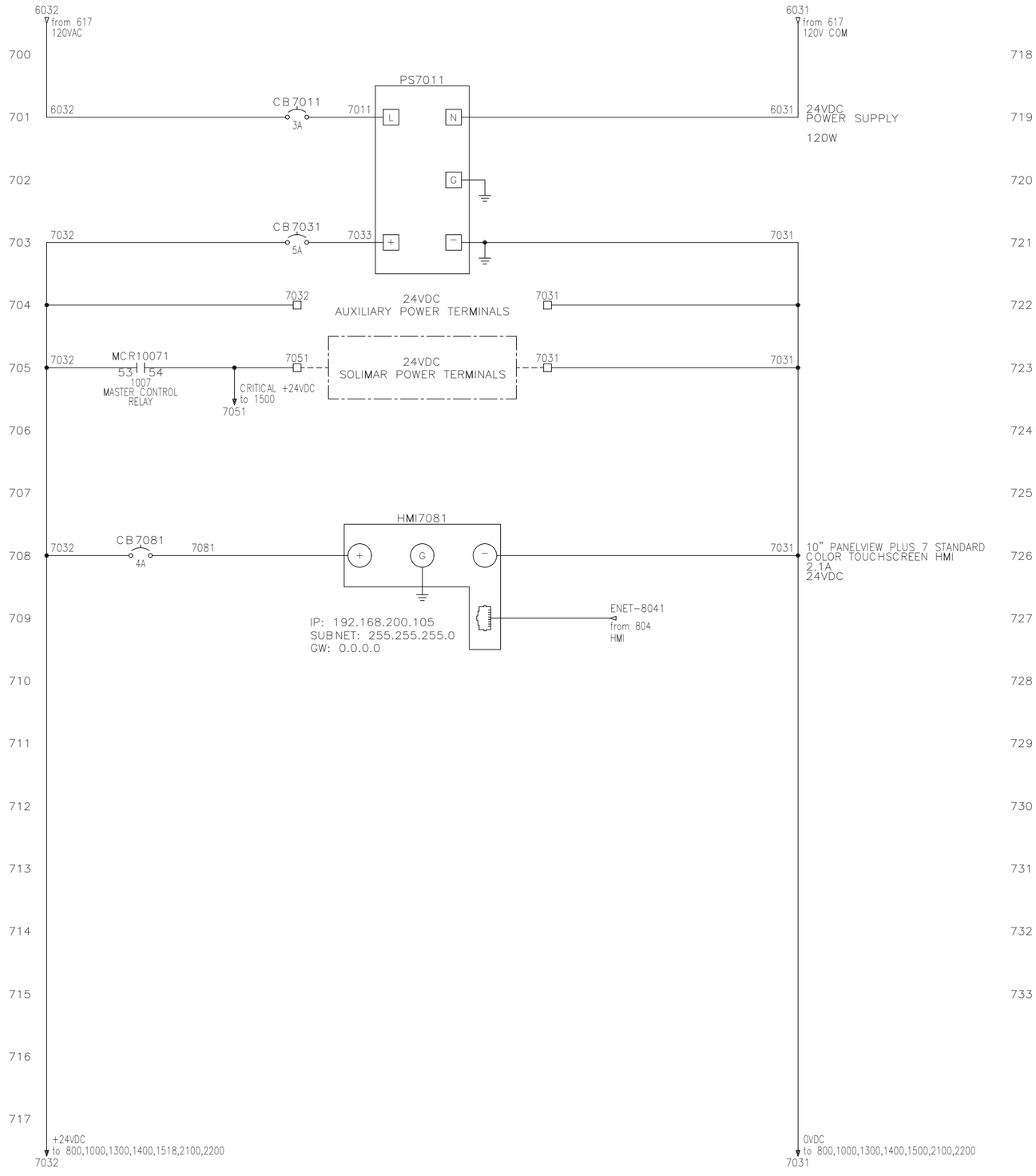
120VAC WIRING DIAGRAM

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	DWG. NO.	REV.
6 OF 27	H20319DA–B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

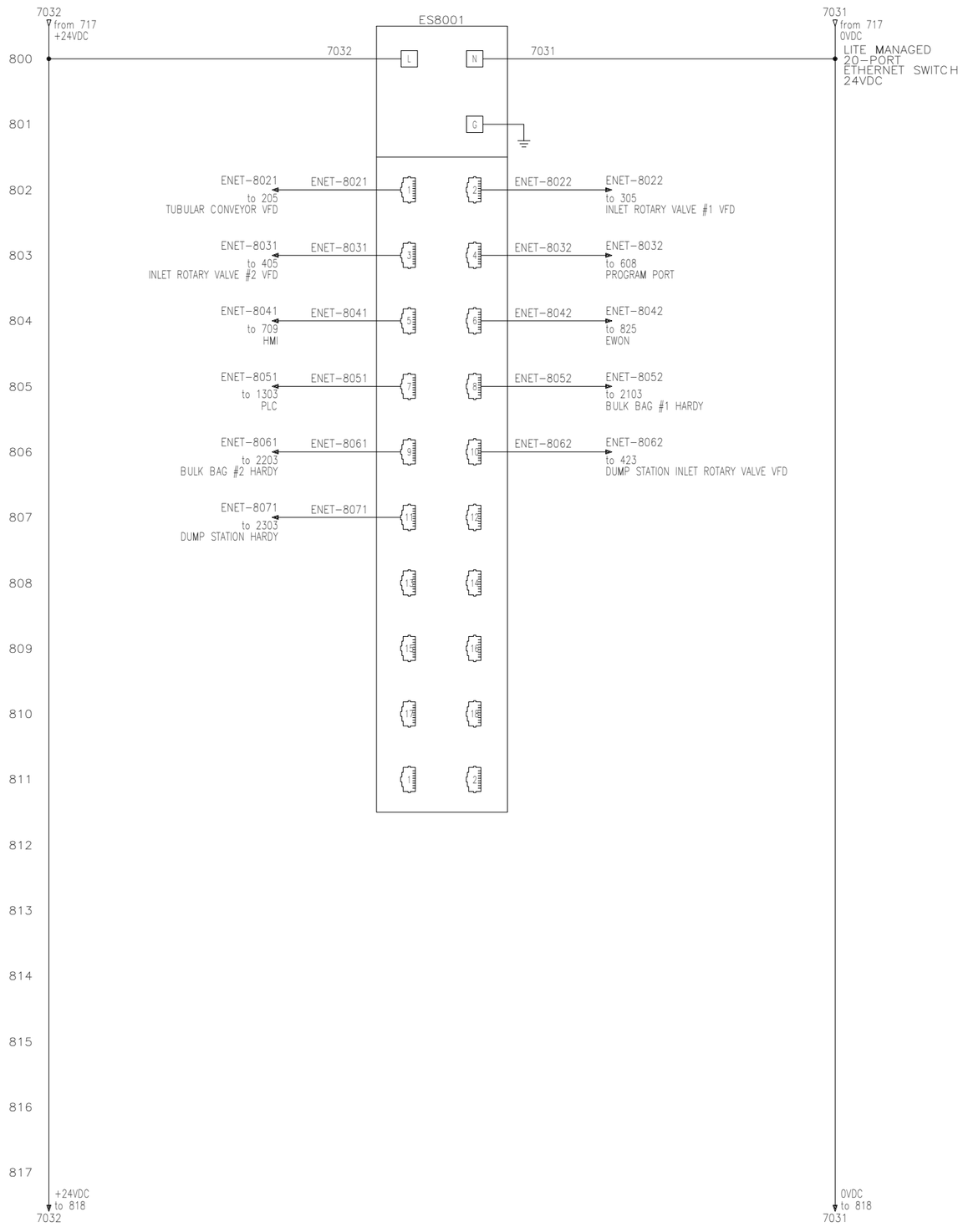
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

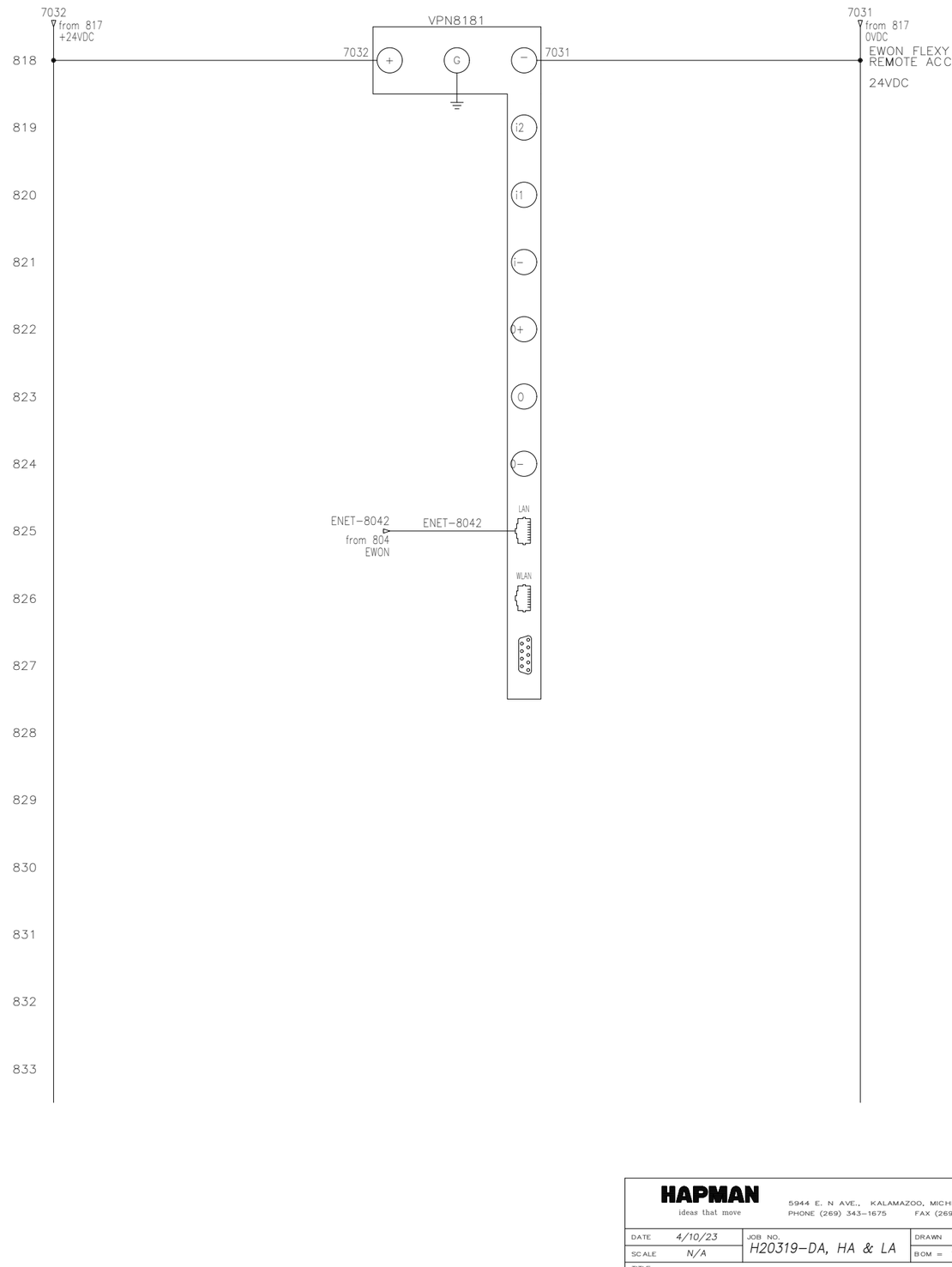
TITLE
24VDC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
7	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
24VDC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET 8 OF 27	DWG. NO. H20319DA-B00	REV. 0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
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5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

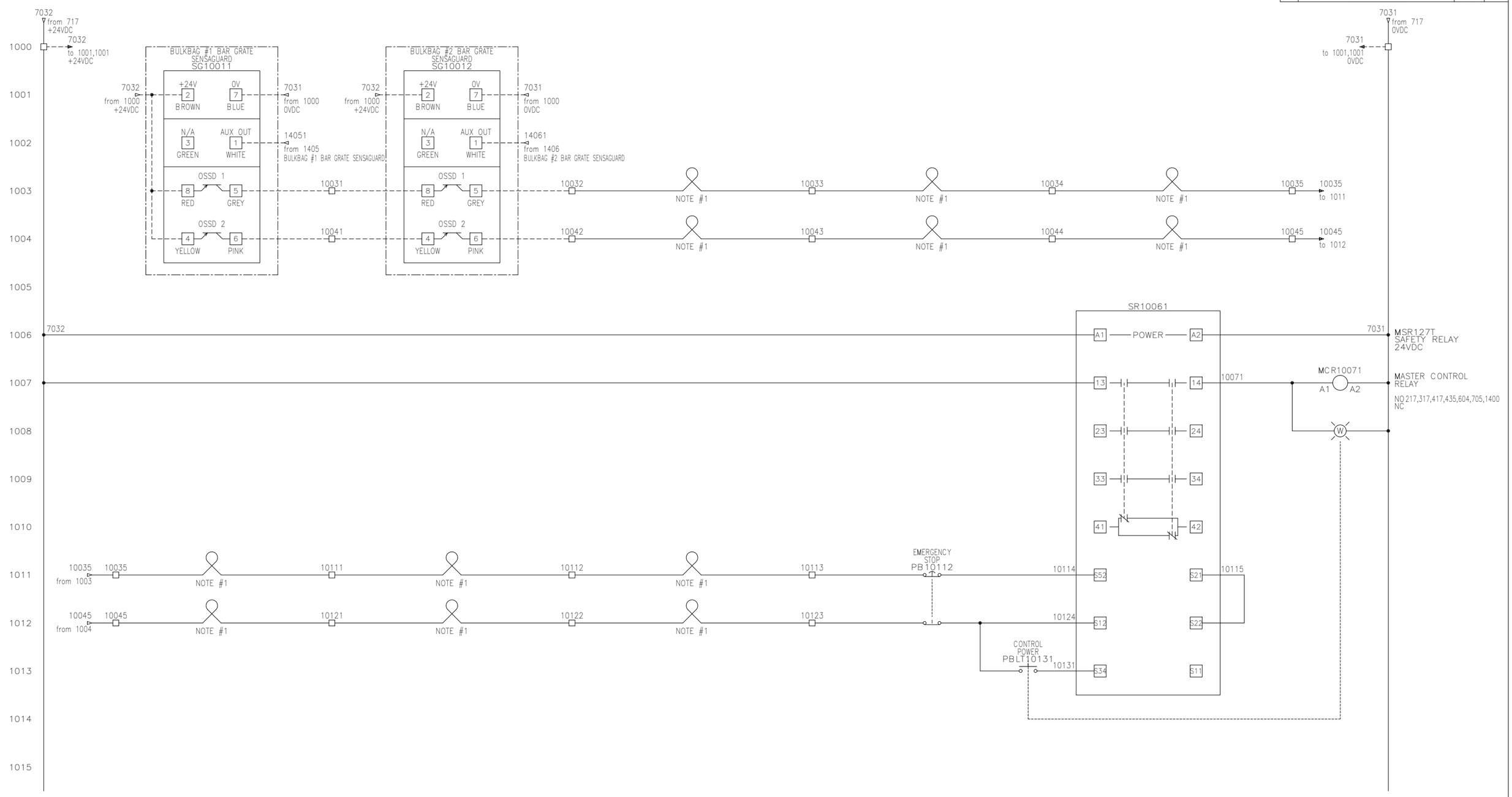
RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET	DWG. NO.	REV.
9 OF 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



NOTES:
1. REMOVE JUMPER IF CIRCUIT IS UTILIZED

HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
SAFETY RELAY WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
10 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
11 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
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DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
RESERVED
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

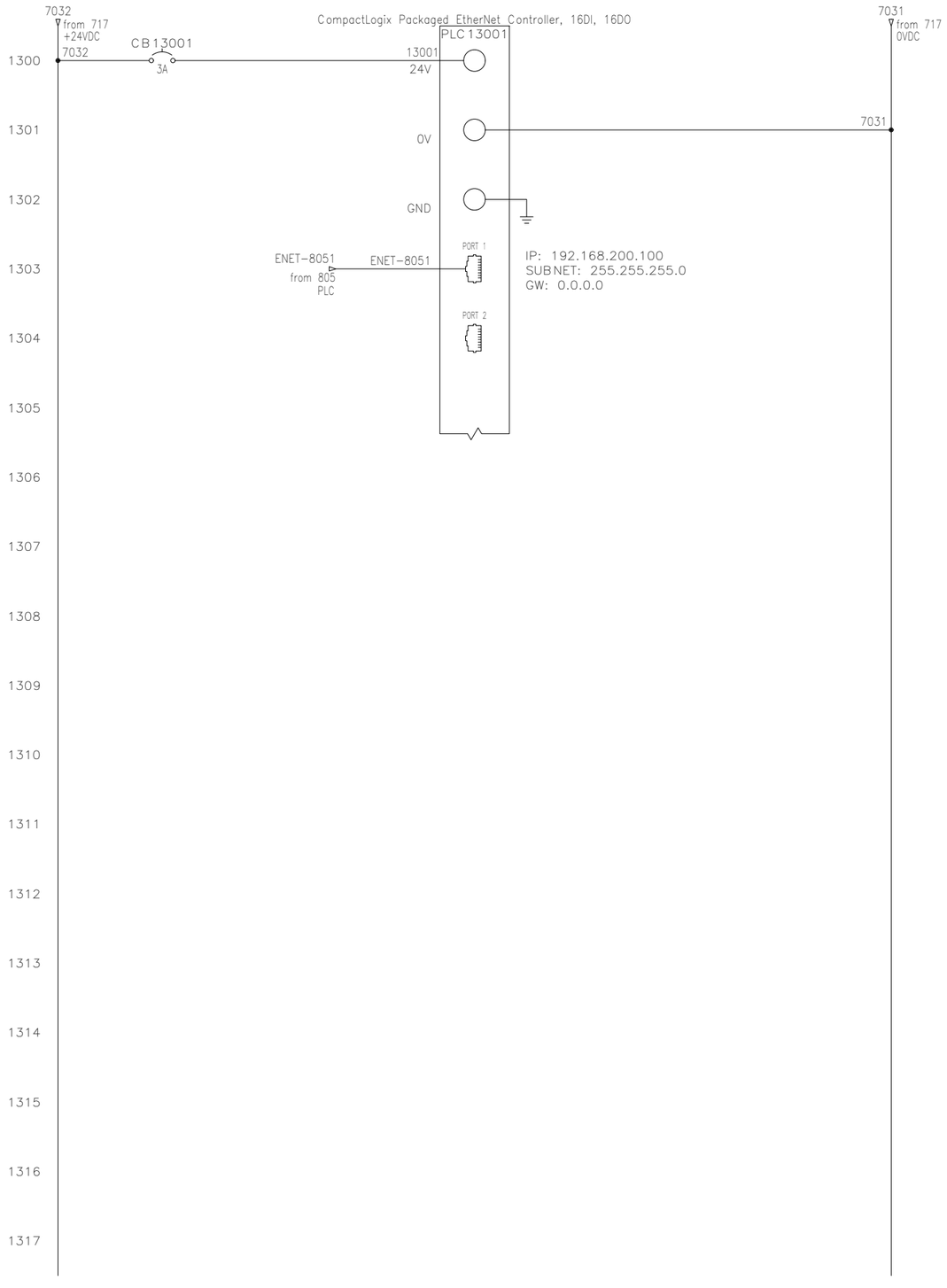
CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
12 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

Allen-Bradley
1769-L24ER-QB1B

CompactLogix Packaged EtherNet Controller, 16DI, 16DO



HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

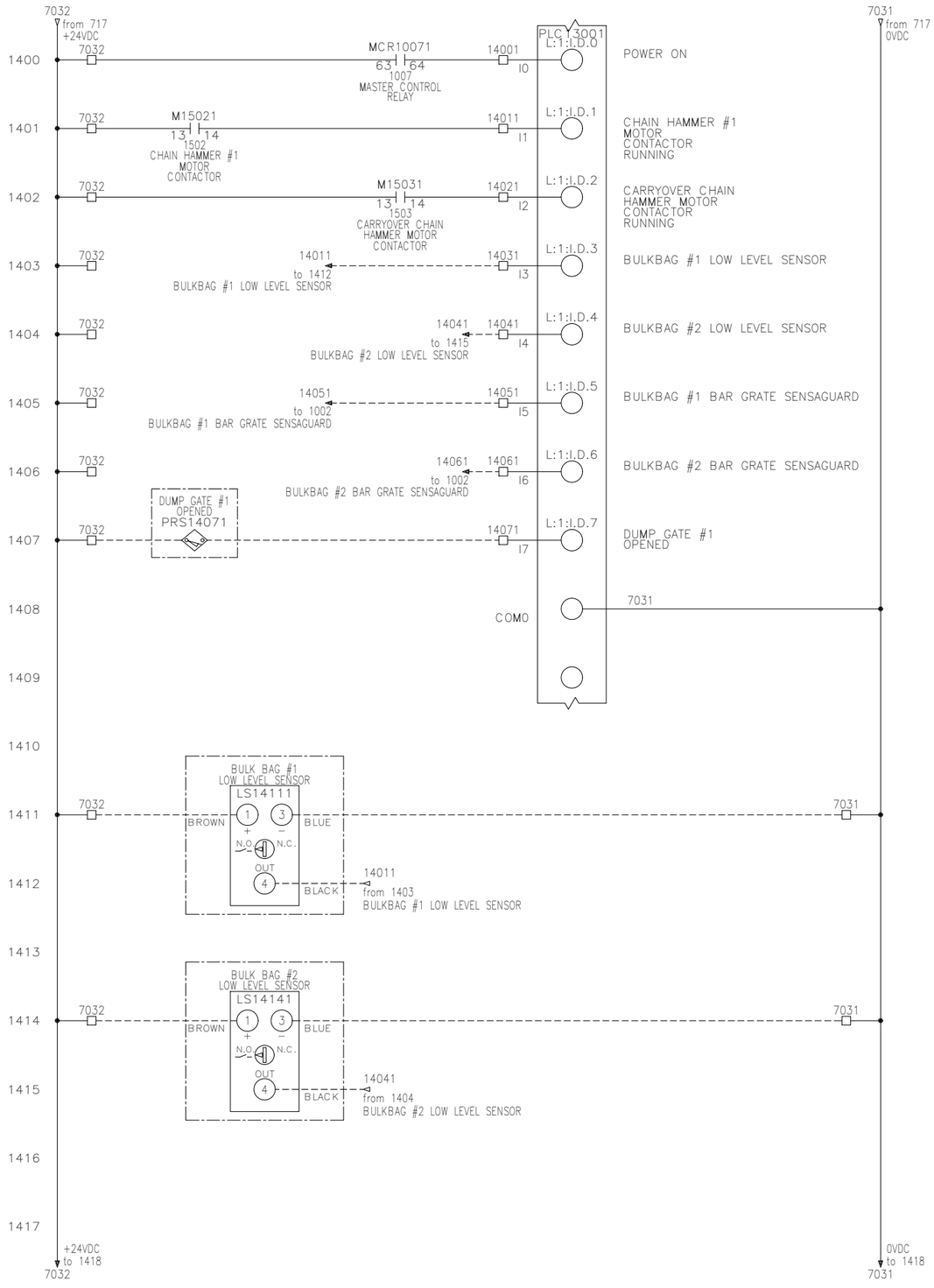
PLC WIRING DIAGRAM

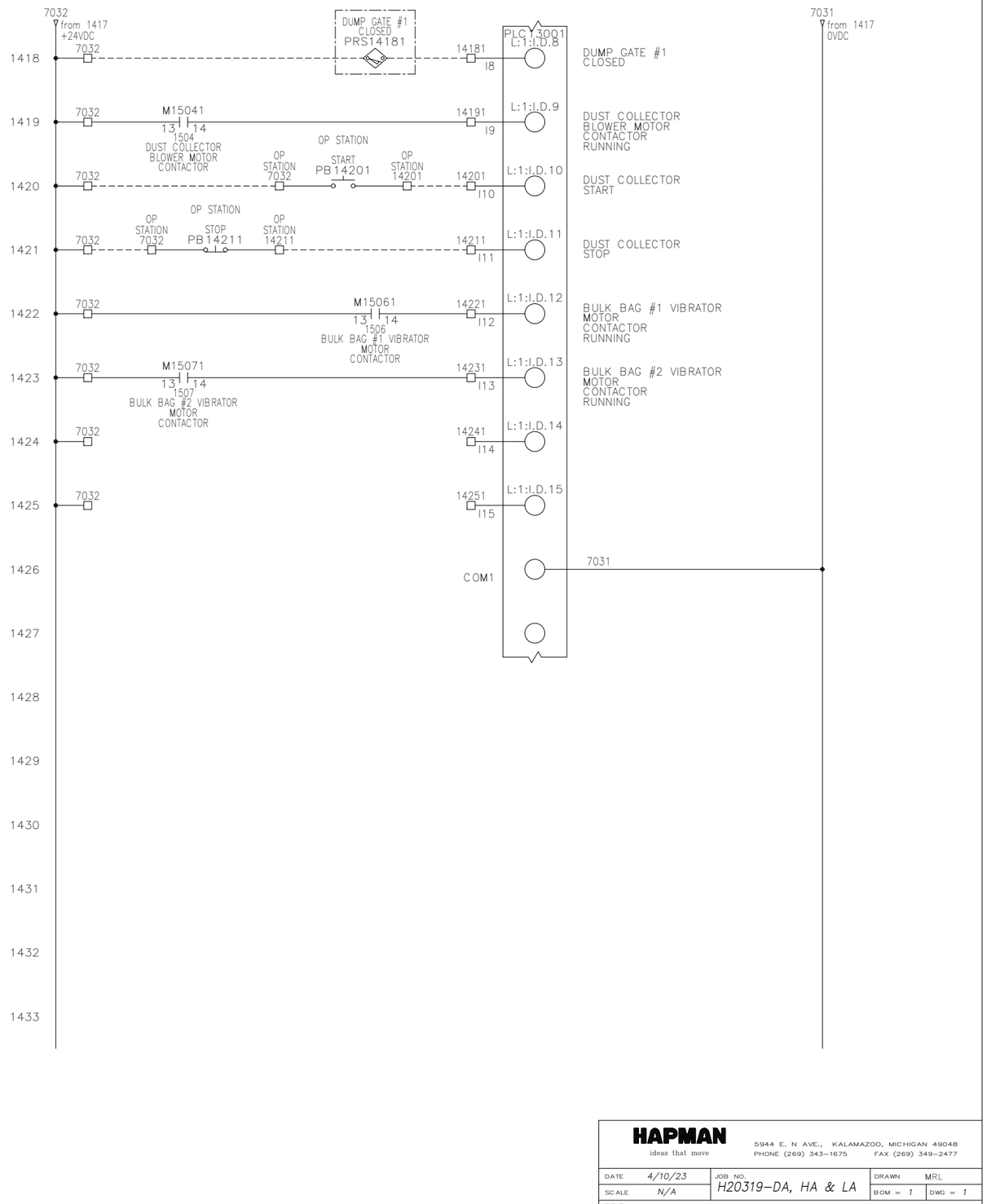
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
13 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

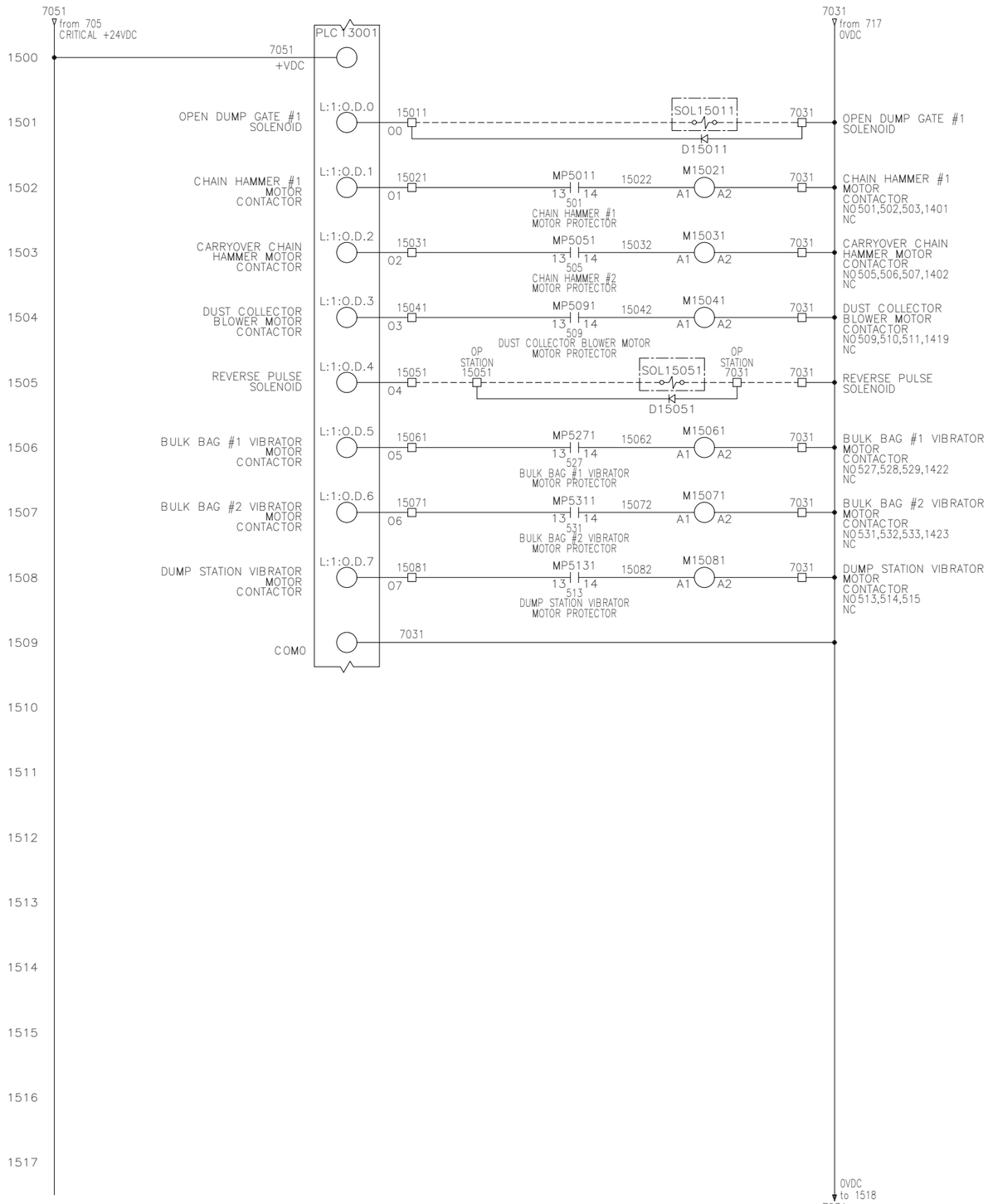
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

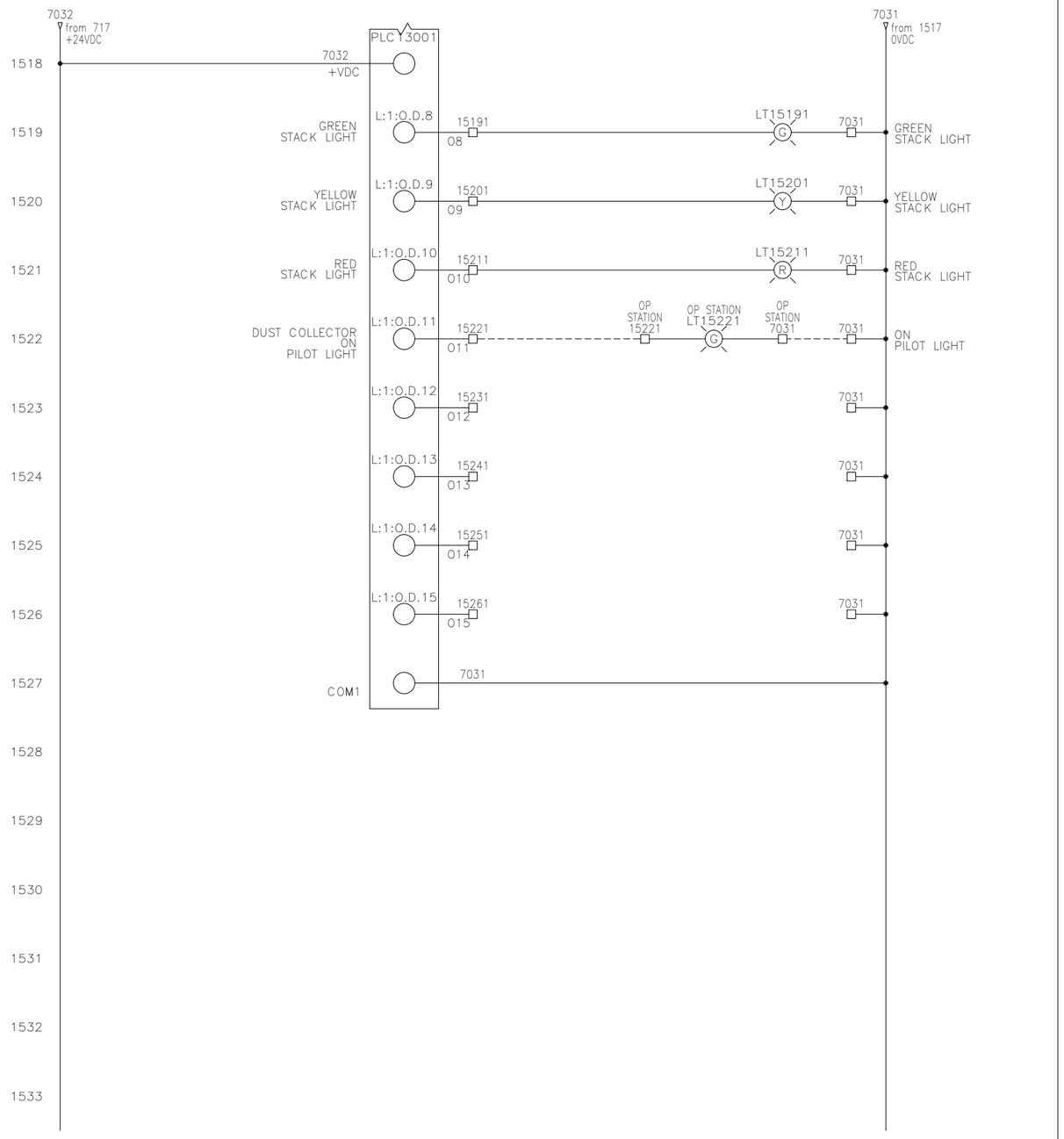
TITLE
PLC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
14 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





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ideas that move
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PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
PLC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
15 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
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5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
RESERVED
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
16 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
17 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
18 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
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5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
19 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

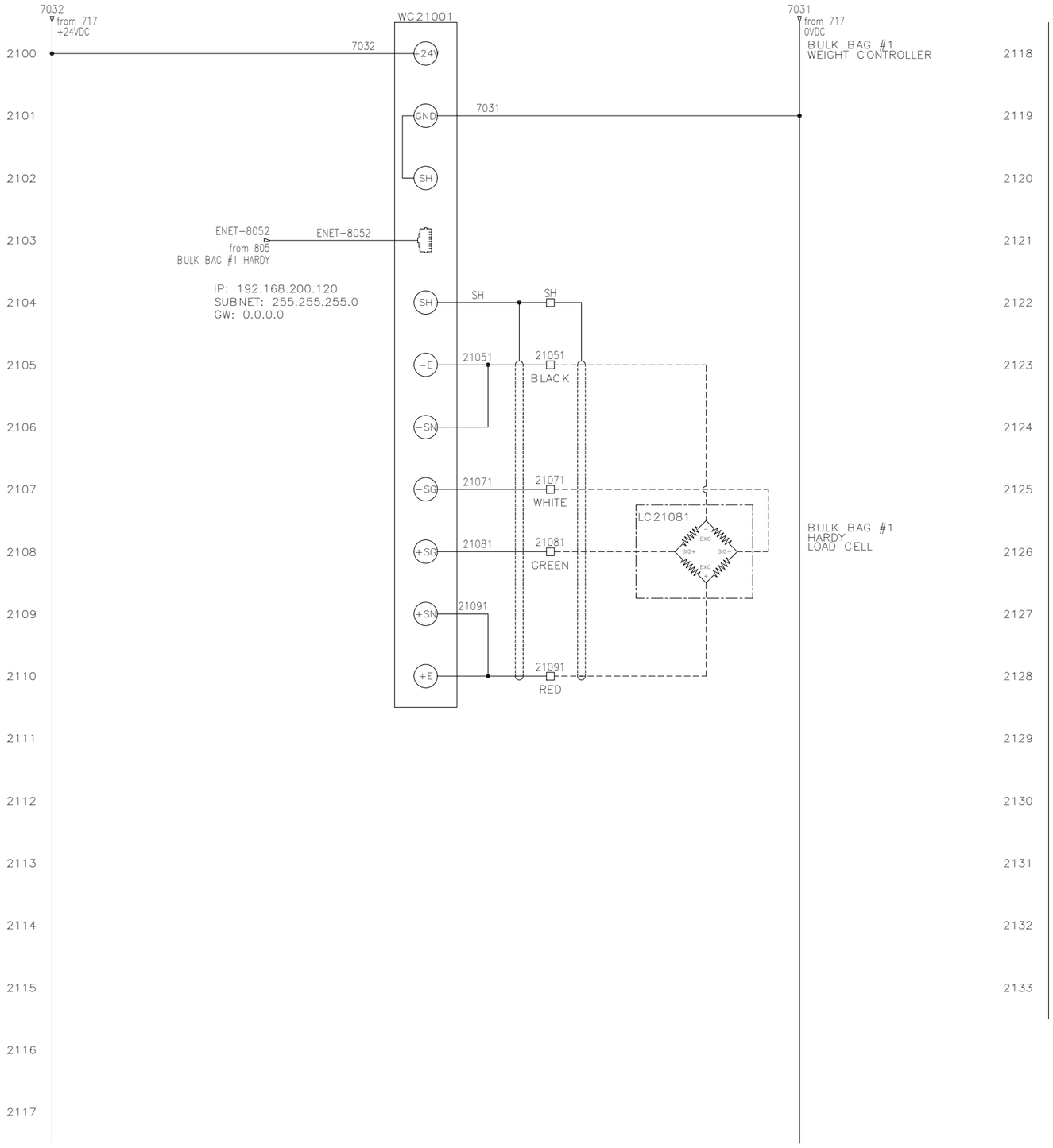
RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
20 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

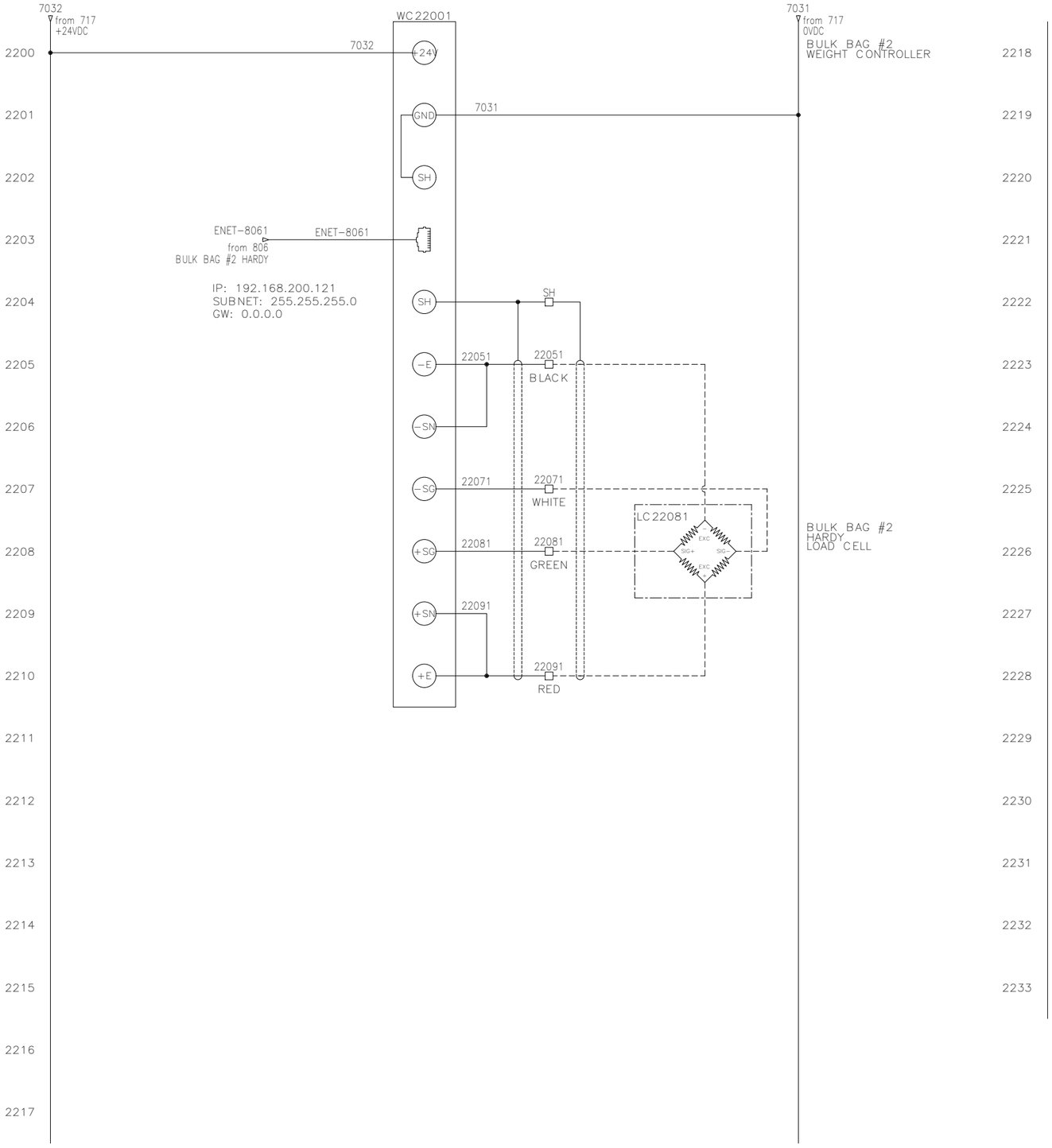
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
HARDY WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
21 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move

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PHONE (269) 343-1675 FAX (269) 349-2477

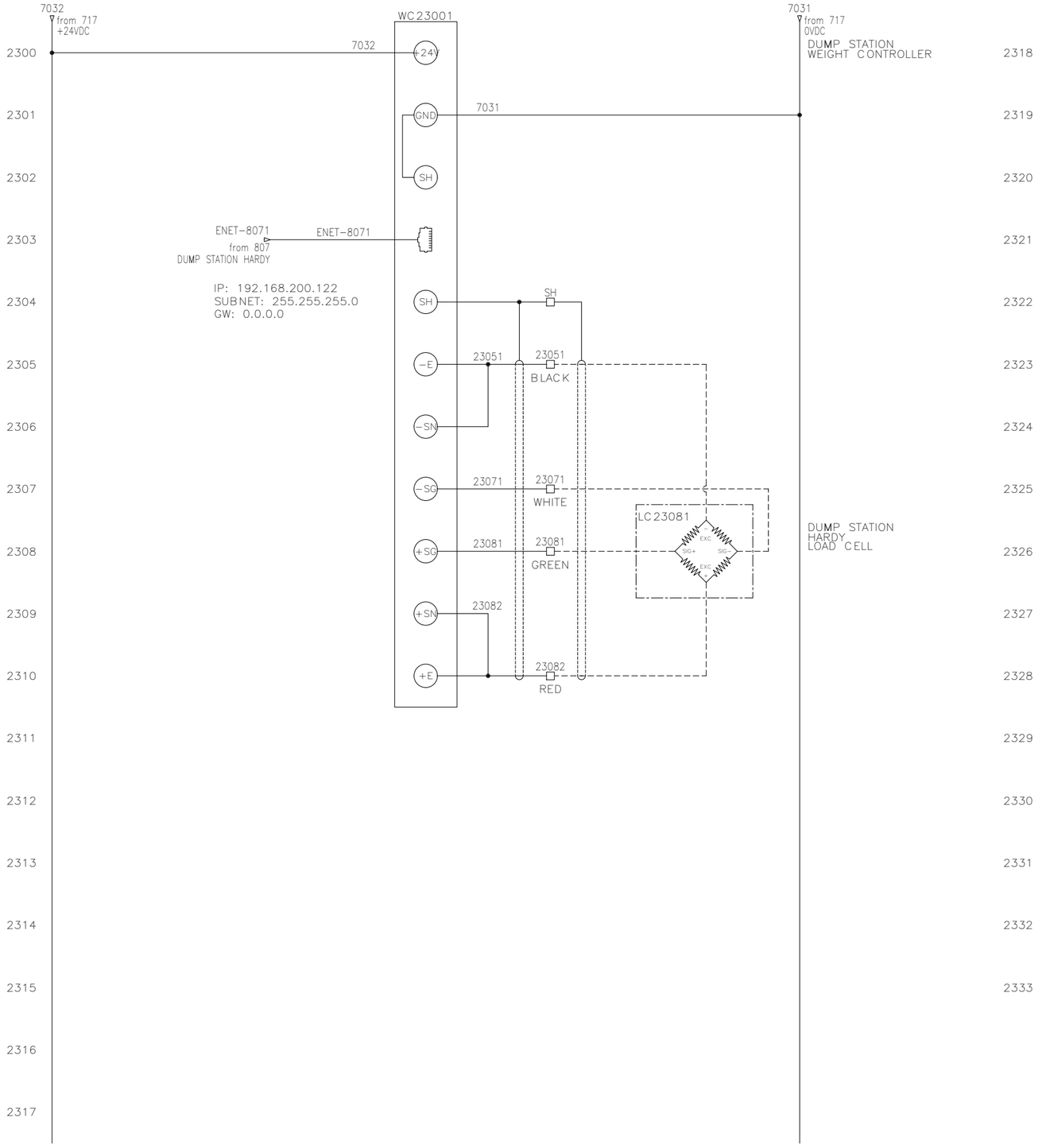
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
HARDY WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
22 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

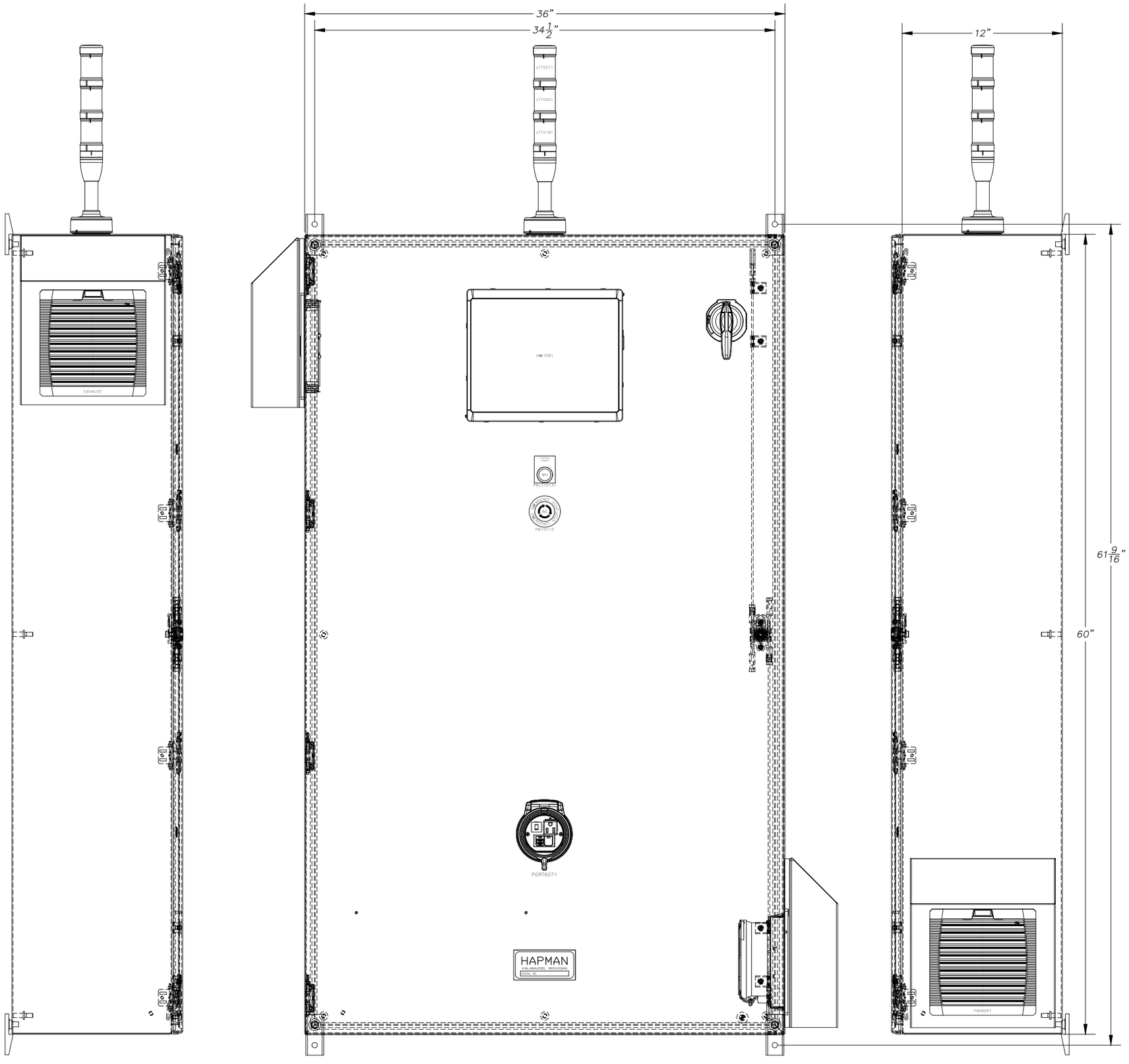
HARDY WIRING DIAGRAM

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
23 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

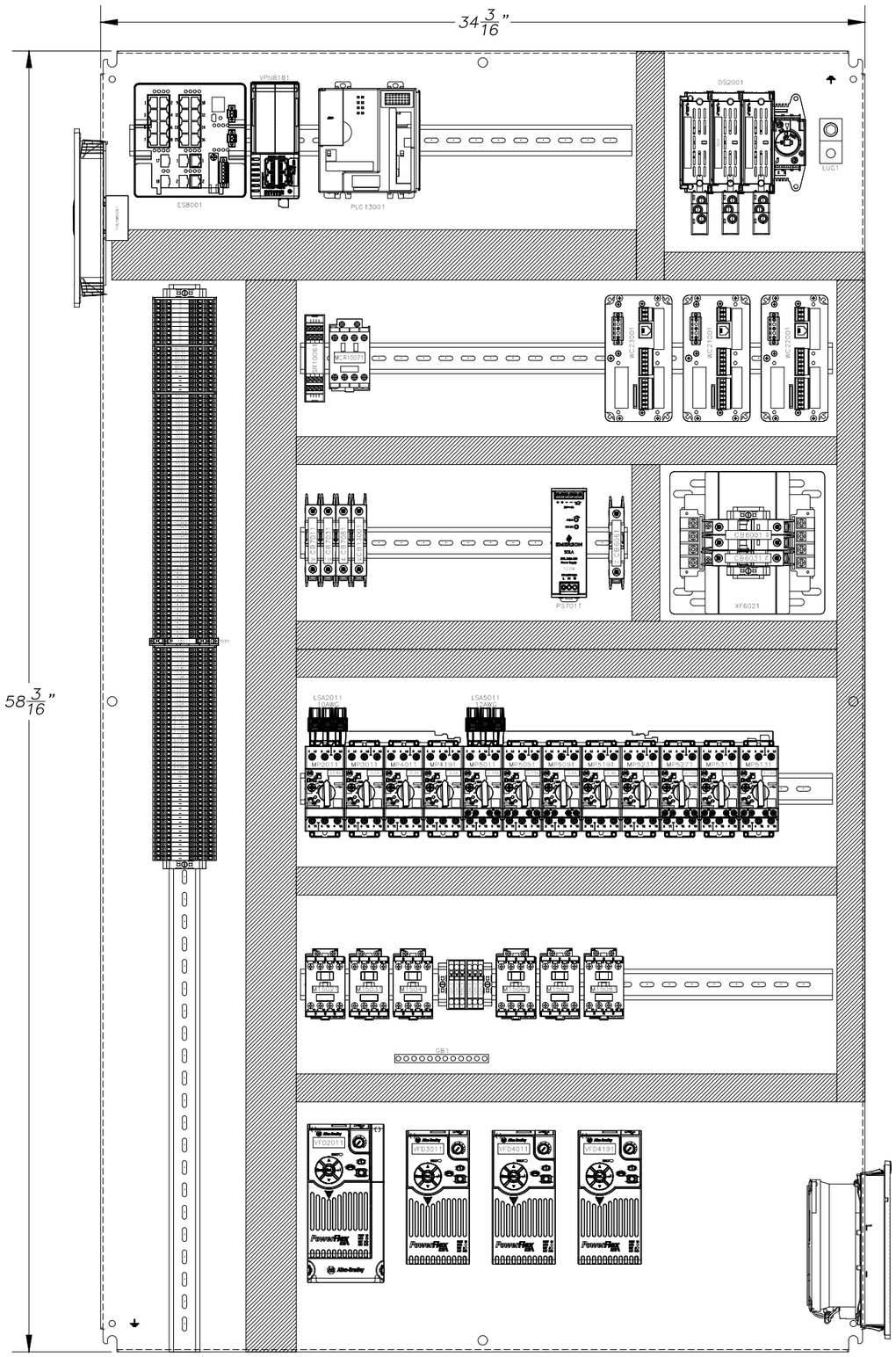
ENCLOSURE LAYOUT

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
24 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



VOLTAGE:	460 VOLT
PHASE & FREQ.:	3PH., 60HZ
FULL LOAD CURRENT:	41 AMP
S.C.C.R.:	10k AMP
ENCLOSURE RATING:	TYPE 4
SCHEMATIC:	H20319DA-B00
MFG. BY:	KMC Global Controls & Automation

HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE:

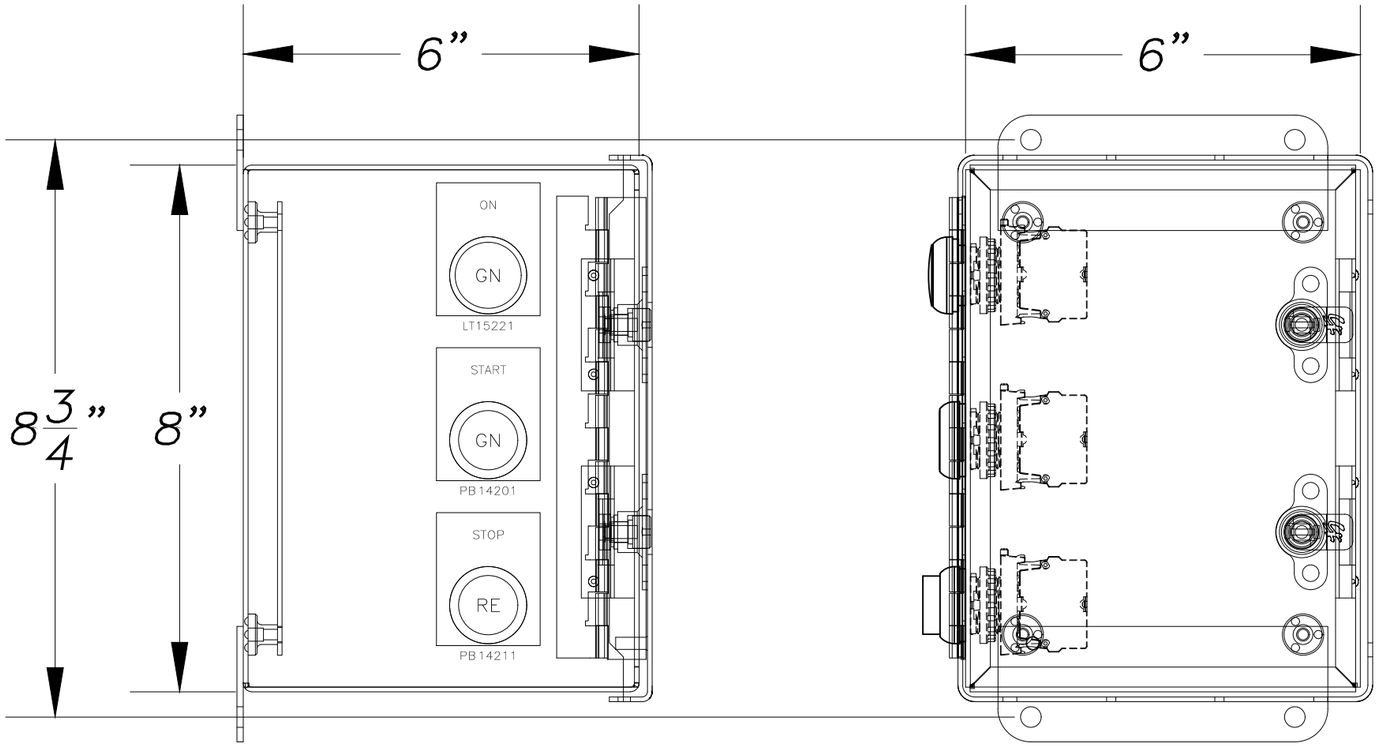
SUB PANEL LAYOUT

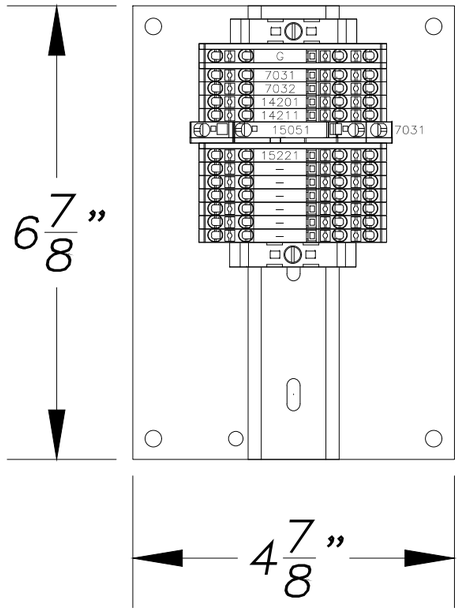
NEMA 4/12 - COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
25 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





DUST COLLECTOR OP STATION	
VOLTAGE:	24VDC
FULL LOAD CURRENT:	1 AMP
ENCLOSURE RATING:	TYPE 4
SCHEMATIC:	H20319DA–B00
MFG. BY:	KMC Global Controls & Automation

HAPMAN
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5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343–1675 FAX (269) 349–2477

DATE	JOB NO.	DRAWN
4/10/23	H20319–DA, HA & LA	MRL
SCALE N/A		BOM = 1 / DWG = 1

TITLE
DUST COLLECTOR OP STATION LAYOUT
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
26 27	H20319DA–B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

ITEM	QTY	PART #	MANUFACTURE	DESCRIPTION	DESCRIPTOR
1	1	CSD603612	HOFFMAN	60"x36"x12" NEMA 4/12 ENCLOSURE	.
2	1	CP6036G	HOFFMAN	GALVANIZED SUB PANEL	.
3	1	CMFK	HOFFMAN	FOOT KIT	.
4	1	194R-J60-1753-PYS1	AB	60A FUSIBLE ROTARY DISCONNECT KIT 12" SHAFT W/ HANDLE	DS2001
5	3	194R-60-MTL3	AB	LUG, MULTI-TAP 60A 3 POINT 4-14AWG	DS2001
6	3	LPJ-60SP	BUSSMANN	60A CLASS J FUSE	FU2001
7	1	LAMA2/0-14-QY	PANDUIT	LUG	LUG
8	1	140MT-C3E-C16	AB	10-16A MOTOR PROTECTOR	MP2011
9	2	140MT-C3E-B40	AB	2.5-4A MOTOR PROTECTOR	MP3011,4011
10	2	140MT-C3E-B10	AB	0.63-1A MOTOR PROTECTOR	MP5011,5051
11	2	140MT-C3E-B63	AB	4-6.3A MOTOR PROTECTOR	MP5191,5231
12	3	140MT-C3E-A25	AB	0.16-0.25A MOTOR PROTECTOR	MP5271,5311,MP5131
13	2	140MT-C-WTEN	AB	LINE SIDE ADAPTER	MP2011,5011
14	2	140MT-C-W454	AB	4 DEVICE, 3 PHASE COMMONING LINK	MP2011-4191,MP5231-5131
15	1	140MT-C-W455	AB	5 DEVICE, 3 PHASE COMMONING LINK	MP5011-5231
16	6	140MT-C-AFA20	AB	AUX CONTACT, FRONT MOUNT 2 NO	MP5011-5131
17	1	25B-D010N104	AB	10.5A 460V POWERFLEX 525 VFD	VFD2011
18	3	25B-D2P3N104	AB	2.3A 460V POWERFLEX 525 VFD	VFD3011,4011,4191
19	6	100-C09EJ10	AB	9A 24VDC IEC NON-REVERSING CONTACTOR	M15021-15071
20	1	1489-M2C040	AB	2 POLE 4A UL489 CIRCUIT BREAKER, C-CURVE	CB6001
21	1	E500JN	SOLA	500VA CPT	XF6021
22	1	IP20	SOLA	FINGERSAFE TERMINAL COVERS	XF6021
23	1	SBEDIN	SOLA	DIN CIRCUIT BREAKER MOUNTING	XF6021
24	1	1489-M1C070	AB	1 POLE 7A UL489 CIRCUIT BREAKER, C-CURVE	CB6031
25	1	1489-M1C010	AB	1 POLE 1A UL489 CIRCUIT BREAKER, C-CURVE	CB6061
26	1	17121000010	PFANNENBERG	FLZ 530 THERMOSTAT W/ N.O. SPRING CONTACT	THERM6061
27	1	11633156055	PFANNENBERG	120V 152 CFM PF33000 SL TYPE 12 FILTERFAN	FAN6061
28	1	11730004055	PFANNENBERG	PFA 30000 TYPE 12 EXHAUST FILTER	EXHAUST
29	2	18182000012	PFANNENBERG	FILTERFAN RAINHOOD TYPE 4	FAN6061,EXHAUST
30	1	DAP3BC-S3-6	PANDUIT	PROG. PORT, SIMPLEX OUTLET, RJ45, 3A CB	PORT6071
31	1	1489-M1C030	AB	1 POLE 3A UL489 CIRCUIT BREAKER, C-CURVE	CB7011
32	1	SVL 5-24-100	SOLA	24VDC 120W POWER SUPPLY	PS7011
33	1	1489-M1C050	AB	1 POLE 5A UL489 CIRCUIT BREAKER, C-CURVE	CB7031
34	1	1489-M1C040	AB	1 POLE 4A UL489 CIRCUIT BREAKER, C-CURVE	CB7081
35	1	2711P-T10C21D8S	AB	PANELVIEW PLUS 7 10" STANDARD COLOR TOUCHSCREEN HMI	HMI7081
36	1	1783-BMS20CGL	AB	20 PORT 5700 LITE MANAGED ETHERNET SWITCH	ES8001
37	3	576-S10-007	QUIKTRON	7' SHIELDED CAT5E ETHERNET CABLE	ENET-8021-8031
38	4	576-S10-010	QUIKTRON	10' SHIELDED CAT5E ETHERNET CABLE	ENET-8032,8041
39	1	576-S10-002	QUIKTRON	2' SHIELDED CAT5E ETHERNET CABLE	ENET-8042
40	1	576-S10-003	QUIKTRON	3' SHIELDED CAT5E ETHERNET CABLE	ENET-8051
41	2	576-S10-005	QUIKTRON	5' SHIELDED CAT5E ETHERNET CABLE	ENET-8052,8061
42	1	FLEXY20500_MA	EWON	FLEXY 205 INDUSTRIAL INTERNET ROUTER	VPN8181
43	1	440R-N23126	AB	24VDC MSR127T SAFETY RELAY	SR10061
44	1	700-CF400EJ	AB	24VDC IEC CONTROL RELAY W/ 4 N.O. CONTACTS	MCR10071
45	1	100-FA40	AB	4 N.O. AUX FRONT MOUNT CONTACT BLOCK	MCR10071
46	1	800FP-MT44PX02	AB	22mm RED EMERGENCY STOP PB W/ 2 N.C. CONTACTS	PB10112
47	1	CT-22ESTOP	CT	22mm LEGEND - EMERGENCY STOP	PB10112
48	1	800FP-LF7PN3WX10	AB	22mm 12-30VAC/DC WHITE ILLUM. FLUSH HEAD PB W/ 1 N.O. CONTACT	PBLT10131
49	1	CT-22CONTROL/POWER	CT	22mm LEGEND - CONTROL/POWER	PBLT10131
50	1	1489-M1C030	AB	1 POLE 3A UL489 CIRCUIT BREAKER, C-CURVE	CB13001
51	1	1769-L24ER-QB1B	AB	COMPACTLOGIX 5370 L2 CONTROLLER	PLC13001
52	1	854J-BQ10C	AB	STACK LIGHT BASE W/ 100mm TUBE	LT15191-15211
53	1	854J-24TL3	AB	24VAC/VDC GREEN LED STACK LIGHT	LT15191
54	1	854J-24TL8	AB	24VAC/VDC YELLOW LED STACK LIGHT	LT15201
55	1	854J-24TL4	AB	24VAC/VDC RED LED STACK LIGHT	LT15211
56	1	1492-LD4DR	AB	DOUBLE STACK DIODE TERMINAL	D15011
57	1	1492-EBLD4	AB	END PLATE FOR DOUBLE STACK DIODE TERMINAL	D15011

ITEM	QTY	PART #	MANUFACTURE	DESCRIPTION	DESCRIPTOR
58	3	HI-4050-DR-DC-EIP	HARDY	WEIGHT CONTROLLER	WC21001-23001
59	6	3211757	PHOENIX	6.2mm 30A PUSH IN TERMINAL	.
60	2	3030420	PHOENIX	END COVER FOR 6.2mm PUSH IN TERMINAL	.
61	110	1492-P3Q	AB	5.1mm 4-WIRE PUSH IN TERMINAL	.
62	12	1492-PG3Q	AB	5.1mm 4-WIRE PUSH IN GROUND TERMINAL	.
63	5	1492-EBP3Q	AB	END PLATE FOR 5.1mm 4 WIRE PUSH IN TERMINAL	.
64	6	0800886	PHOENIX	SCREW ON END STOP	.
65	7'	F2X4LG6	PANDUIT	2"x4" LIGHT GRAY WIREWAY	.
66	7'	C2LG6	PANDUIT	2" LIGHT GRAY WIREWAY COVER	.
67	12.5'	F1X4LG6	PANDUIT	1"x4" LIGHT GRAY WIREWAY	.
68	12.5'	C1LG6	PANDUIT	1" LIGHT GRAY WIREWAY COVER	.
69	13'	111023	E-RAIL	35mm DIN RAIL	.
70	1	GBK10	EATON	10 POINT GROUND BAR	GB1
71					
72					
73	1	A8066CHFL	HOFFMAN	8"x6"x6" NEMA 4/12 ENCLOSURE	DUST COLLECTOR OP STATION
74	1	A8P6G	HOFFMAN	GALVANIZED SUB PANEL	.
75	1	800FP-F3PX10	AB	22mm GREEN FLUSH HEAD PB W/ 1 N.O. CONTACT	PB14021
76	1	CT-22START	CT	22mm LEGEND - START	PB14021
77	1	800FP-E4PX01	AB	22mm RED EXTENDED HEAD PB W/ 1 N.C. CONTACT	PB14211
78	1	CT-22STOP	CT	22mm LEGEND - STOP	PB14211
79	1	800FP-P3PN3G	AB	22mm 24VDC GREEN LED PILOT LIGHT	LT15221
80	1	CT-22ON	CT	22mm LEGEND - ON	LT15221
81	1	1492-LD4DR	AB	DOUBLE STACK DIODE TERMINAL	D15051
82	1	1492-EBLD4	AB	END PLATE FOR DOUBLE STACK DIODE TERMINAL	D15051
83	12	1492-P3Q	AB	5.1mm PUSH IN 20A 2 CONNECTIONS PER SIDE	.
84	2	1492-EBP3Q	AB	END PLATE FOR 5.1mm PUSH IN TERMINAL	.
85	2	0800886	PHOENIX	SCREW ON END STOP	.
86	1'	111023	E-RAIL	35mm DIN RAIL	.
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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE	4/10/23	JOB NO.	H20319-DA, HA & LA	DRAWN	MRL
SCALE	N/A			BOM = 1	DWG = 1

TITLE

BILL OF MATERIALS

NEMA 4/12 - COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
27	27	H20319DA-B00	0.3

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 Corporation Contact Person: Dan Elsasser

Tel: (605) 453 – 1183

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:
It is used for a unique manufacturing process at entity's location above. Industrial Machinery: Hapman H20319DA-B00 with KMC GLOBAL CONTROLS & AUTOMATION control panels.
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 October 2024.

Name of Professional Engineer involved: Joshua Jay 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: Dan Elsasser Position: Manufacturing Engineering Manager

SIGNATURE 02 / 05 / 2025 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

Muth Power Solutions

Field Evaluated

Equipment MFGR: KMC Global, Hapman

Industrial Machinery: H20319DA-B00

Field Label No.: MPS-FEB-060003

To Verify Label, Call (605)-996-3983

Industrial Machinery Field Evaluated to UL Standards, NFPA 79 and NFPA 70 Article 670. A Report Supplements this Label and Details the Evaluation

Evaluation Date: 10/10/2024

10/28/24

Field Evaluation of Non-Listed Industrial Machinery
MPS-FEB-060003

Industrial Machinery: H20319DA-B00
Control Panels by: KMC GLOBAL CONTROLS & AUTOMATION
Industrial Machinery by: Hapman

Henkel
600 E Willow St
Minnehaha County, South Dakota

Revision	Description	Date
1.0	Initial Release	10/25/2024

Muth Power Solutions

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

Summary:

H20319DA-B00-3 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 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-060003**. 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)

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

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: **480 VOLT**
- Number of Phases: **3 PHASE**
- Frequency Rating: **60 Hz**
- Full-Load Current: **41 Amps**
- Short Circuit Current Rating: **10 KAIC**
- Largest Motor or Load: **5 HP**
- Electrical Drawing Number: **H20319DA-B00**

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 result of the summation equation above puts the FLA at approximately 41-43 Amps & 125% of that is 51.25A-53.75A. The supply conductors are #2 AWG Copper and are rated for 115A @ 75 Deg C.

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

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

Largest Motor							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
Conveyor Motor (Top of Bin)	5	7.85	460	3	0.8	0.886	8.82

Other Loads							
Load	HP	Amps	Voltage	Phases	Power Factor	Efficiency	Apparent Power [kVA]
BBU Rotary Valve #1	1	2.04	460	3	0.7	0.95	2.44
BBU Rotary Valve #2	1	2.04	460	3	0.7	0.95	2.44
Dump Rotary Valve	1	2.04	460	3	0.7	0.95	2.44
Bulk Bag Vibrator Motor #1	-	0.16	460	3	0.88	0.9	0.16
Bulk Bag Vibrator Motor #2	-	0.16	460	3	0.88	0.9	0.16
Dump Station Vibrator Motor	-	0.16	460	3	0.88	0.9	0.16
Trolley/Hoist Motor #1	2.4	4.5	460	3	0.88	0.9	4.53
Trolley/Hoist Motor #2	2.4	4.5	460	3	0.88	0.9	4.53
Enclosure 120V Loads	-	0	0	0	0	0	0.50
Dust Collector	2	3.4	460	3	0.88	0.9	3.42
Chain Hammer Motor #1	0.3	0.73	460	3	0.88	0.9	0.73
Chain Hammer Motor #2	0.3	0.73	460	3	0.88	0.9	0.73
Chain Hammer Motor #3	0.3	0.73	460	3	0.88	0.9	0.73

Supply Conductor Rating @ 75 Deg C (#2 Copper)
115

Calculated Amps (1.25 (heat + large motor) + Other Loads)
42.70

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 enclosure has a single Allen Bradley disconnect that has integral, 60A fuses

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

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 enclosure is supplied from a 60A ABB breaker. It is equipped with an AB main disconnect that has integral Class J, 60A fuses (Bussmann LPJ-60SP). The overcurrent calculation above showed that 60A is appropriate overcurrent 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.

- Supply conductors = #2 AWG Copper and ~ 150' length. The approximated fault current from SWBD-2 down to this control panel was less than 10 kA. With a SCCR rating of 10 kAIC, the panel is compliant

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 = √3 x L x I n x C x E	Total Available Fault Current Itot=Isc+Isy m(mot.cont.)	Tra
CT-1	10	55,789	COPPER	500 MCM	NON-MAGNETIC	26706	480	8	0.01	**55268**	
SWBD-2	55	55,268	COPPER	500 MCM	NON-MAGNETIC	26706	480	8	0.05	**52569**	
Hapman 1	150	52,569	COPPER	2 AWG	STEEL	5906	480	1	4.82	**9036**	
Hapman 2	150	52,569	COPPER	2 AWG	STEEL	5906	480	1	4.82	**9036**	
Hapman 3	150	52,569	COPPER	2 AWG	STEEL	5906	480	1	4.82	**9036**	

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 switchboard that feeds this enclosure has adequate surge protection for AC conductors.

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

NFPA 70, Article 670 Compliance Result:

☒ PASS

☐ FAIL

☐ Remediation Required (Refer to Issues 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 machinery is rated for 480V. It was observed to be operating approximately at 488V line-to-line for AB, BC, and CA phases. This is within the acceptable voltage range. There were not any Line-Neutral loads of 277V present in this enclosure. A 500VA control transformer steps the voltage down to 120V for control voltage, convenience receptacle in enclosure, and feed to 24VDC power supply.

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

Environmental

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

- The machinery is installed in an industrial manufacturing environment. It's possible for the enclosure to be exposed to powder product. The enclosure is rated adequately for NEMA 12, 4 environments

- It is in a temperature-controlled environment within an insulated building. The machinery's operating temperature was approximately 70-71 Deg F within the enclosure. Ambient temperature was observed to be around 70 Deg F within the building.

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

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 above section. As approximated above, the maximum fault current to this enclosure is less than 10 kAIC, so the panel's 10 kAIC SCCR is appropriate.

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 above section. The enclosure has a single Allen Bradley disconnect that has integral, 60A fuses. It disconnects all of the electrical equipment connected to the industrial control panel and 60A rating is greater than 115% of FLA.

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.

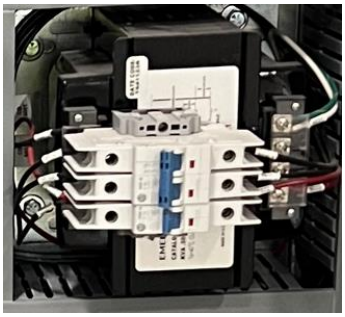
- The enclosure The enclosure has a single Allen Bradley disconnect that has integral, 60A fuses. It disconnects all of the electrical equipment connected to the industrial control panel. All parts are guarded that are greater than 50VAC / 60 VDC. An arc flash warning placard is placed near the disconnecting means.

Protection of Equipment

The system has the following protection for the equipment

- Overcurrent
  - Supply Feeder #2 CU: 60A fuses (Bussmann LPJ-60SP)
  - Control XFMR
    - Primary of 500 VA control XFMR : Allen Bradley 1489-M 2P Breaker (4A)
    - Secondary of 500 VA control XFMR : Allen Bradley 1489-M 1P Breaker (7A)

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

- Other Loads in Enclosure
  - Enclosure Fan & Receptacle (120VAC): Allen Bradley 1489-M 1P Breaker (3A)
  - Power Supply (120VAC): Allen Bradley 1489-M 1P Breaker (1A)
  - DC Power (24VDC): Allen Bradley 1489-M 1P Breaker (5A)
  - DC Power (24VDC): Allen Bradley 1489-M 1P Breaker (4A), Terminal Jumper
  - DC Power (24VDC): Allen Bradley 1489-M 1P Breaker (3A), Terminal Jumper
  - 24VDC Devices
    - Hardy Weight Controllers (3 Total)
    - Allen Bradley Safety Relay Power (1 Total)
    - Allen Bradley Panelview HMI (1 Total)
    - Allen Bradley Stratix 5700 (1 Total)
    - Allen Bradley CompactLogix L24ER QB1B (1 Total)
    - Bulk Bag Bar Grate SensaGuard (2 Total)
    - Solimar (1 Total)

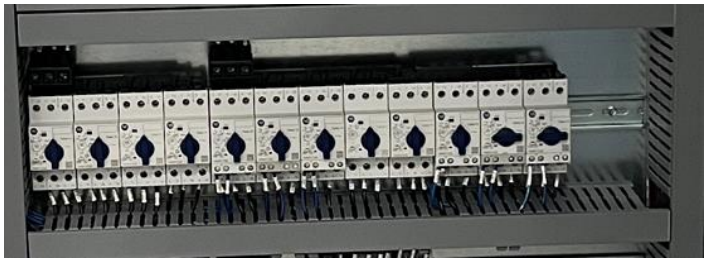


- Motor Protection (12 Total)
  - Each motor circuit is protected with Allen Bradley 140MT-C3E Class 10 motor circuit protector which has integral overload protection via thermal trip. This MCP accounts for motor inrush & allows the system to operate as intended. The 140MT-C3E has a short circuit rating of at least 65 kAIC at 480V and is rated as motor disconnect.
    - Conveyor Motor (FLA 6.5A) - Observed Trip Setting on MCP: **13.8A**
    - Inlet Rotary Valve #1 Motor (FLA 1.6A) - Observed Trip Setting on MCP: **3.2A**
    - Inlet Rotary Valve #2 Motor (FLA 1.6A) - Observed Trip Setting on MCP: **3.2A**

Field Evaluation Number: MPS-FEB-060003 Industrial Machine: H20319DA-B00 Date: 10/28/2024

- Dump Inlet Rotary Valve Motor (FLA 1.6A) - Observed Trip Setting on MCP: **3.2A**
- Chain Hammer #1 Motor (FLA 0.73A) - Observed Trip Setting on MCP: **0.73A**
- Carryover Chain Hammer Motor (FLA 0.73A) - Observed Trip Setting on MCP: **0.73A**
- Dust Collector Blower Motor (FLA 3.4A) - Observed Trip Setting on MCP: **3.4A**
- Hoist & Trolley #1 Motor (FLA 5.8A) - Observed Trip Setting on MCP: **5.9A**
- Hoist & Trolley #2 Motor (FLA 5.8A) - Observed Trip Setting on MCP: **5.9A**
- Dump Station Vibrator Motor (FLA 0.16A) - Observed Trip Setting on MCP: **0.16A**
- BBU #1 Vibrator Motor (FLA 0.16A) - Observed Trip Setting on MCP: **0.16A**
- BBU #2 Vibrator Motor (FLA 0.16A) - Observed Trip Setting on MCP: **0.16A**

Bulletin No.	**140MT-C**
Frame Size	C-Frame
Max. Current I_e	32 A
Current Rating	0.1...32 A
Short-circuit protection	✓
Standard magnetic trip	✓
High magnetic trip	–
Magnetic-only trip (Motor Circuit Protector [MCP])	–
Overload protection	✓
Trip Class	10
Phase loss sensitivity	✓
Short-circuit Indication	✓
Variable-frequency Drive (VFD) downstream compatible	–
UL 60947-4-1 Application Ratings:	
Motor Disconnect	✓ (see ratings)
Group Installation	✓ (see ratings)
Tap Conductor Protection	✓ (see ratings)
Manual, Self Protected (Type E)	✓ (see ratings)
Type F ratings with 100-C and 100-E Contactors	✓ (see ratings)



- Overvoltage Protection – Safety Circuit
  - NFPA 79 requires the safety signals have surge/overvoltage protection. The safety relay is powered from 24VDC & the 120VAC to 24VDC power supply has built-in surge/over voltage protection (Emerson SOLA SVL 5-24-100) that is latching. The signals from the safety relay to the VFDs are also 24VDC

	Protections	
Overvoltage Protection	16-18.7 V, Latching	30-34.8 V, Latching
Overload Protection	Current foldforward and then hiccup	
Over Temperature Protection	No Component Damage, Latch Mode	
Short Circuit	Hiccup Mode, Non-Latching (Auto-Recovery when the fault is removed)	
Power Factor Correction	Meets EN61000-3-2 Class A	

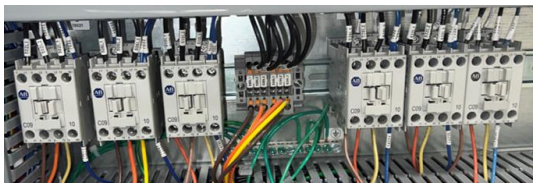
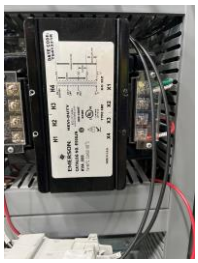
Grounding & Bonding

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.

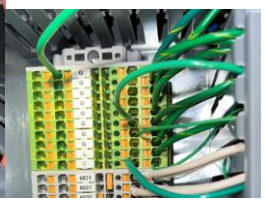
Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

- Main Ground Lug for supply conductors is identified with the symbol and conductor has green colored insulation. Each electrical equipment within the enclosure is properly bonded to ground & has a dedicated termination for the equipment grounding conductor (solid green or with a green/yellow stripe) that's sized in compliance with NFPA 70, Article 250.122 for the upstream overcurrent protection trip threshold. The control XFMR is bonded on the secondary & case. Each VFD is bonded appropriately for the connected motor. Enclosure's doors had a separate bonding jumper to ensure continuity was maintained at all times.







Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

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 enclosure is equipped with an Allen Bradley safety relay that interlocks the (4) VFDs. There is also an emergency stop button that's compliant with NFPA 79's standards; the components were tested to ensure it interrupted the system when engaged.

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)

  - There is an emergency stop button on the PLC enclosure and the dust collector operator interface is within 10' of the main enclosure. The dust collector has a local start (GREEN), stop (RED), and on (GREEN) push-buttons. There is a stack light with red, green, and yellow. These interfaces are compliant with NFPA 79's recommended color code for the associated control function.

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

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.

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

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

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

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.

- Supply conductors / raceways were observed to be compliant during the evaluation. Exposed conductors were observed to be copper and sized appropriately for the connected loads. It appeared that the installation followed UL508a's recommended color codes for voltages, AC/DC loads, and grounded/ungrounded. Insulation was observed to be rated for 600V. Conductors with differing voltages were ran in separate raceways/Panduit where possible.
  - Supply Conductors - #2 AWG CU
  - Control XFMR Conductors - #14 AWG CU
  - Fan Thermostat Conductors - #16 AWG CU
  - Motor Conductors - #12 AWG CU
  - DC Conductors - #14 AWG CU
  - 120VAC Conductors - #14 AWG 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.

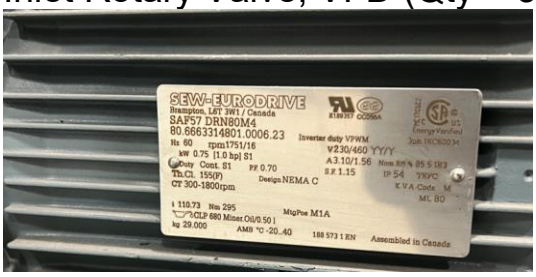
Electric Motors and Associated Equipment

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 were installed in compliance with manufacturer & matched provided design drawings; they're accessible and future maintenance will be able to be done for each motor. Each motor had a starter (VFD or across the line) that were sized appropriately for the connected motor. All components were listed and intended for use with the motors. Nameplate data was similar to the design drawings.

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

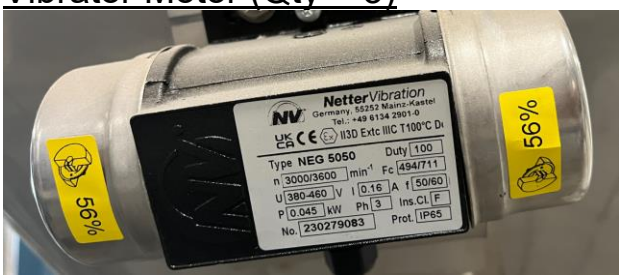
Inlet Rotary Valve, VFD (Qty = 3)



Conveyor Motor, VFD (Qty = 1)

Trolley / Hoist Motors (Qty = 2)

Vibrator Motor (Qty = 3)



Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

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*
  - The label was placed visibly on Enclosure since Voltage was greater than 50VAC or 60VDC

- Nameplate - See above section for picture with information below
  - 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

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.

- Industrial machinery has drawings within enclosure & is numbered H20319DA-B00

NFPA 79 Compliance Result:

☒ PASS

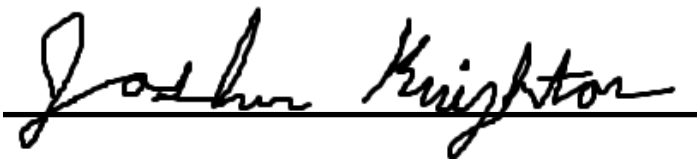
☐ FAIL

☐ Remediation Required (Refer to Observation Log)

Muth Power Solutions
6800 North Diane Circle • Sioux Falls, SD 57107
PHONE (605) 338-6586 · FAX (605) 338-1441
www.muthelectric.com

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

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.



October 28, 2024

Date:

Joshua J. Knighton
Professional Engineer

Field Evaluation Number: MPS-FEB-060003 **Industrial Machine: H20319DA-B00** **Date:** 10/28/2024

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**	**Observation**	**Corrective Action Required**
-	-	Cables for VFD are ran THHN and installed in conduit with non-VFD cables. It was also noted that load wiring from the VFD was not shielded VFD cabling & there was not a reactor installed for the VFD	No - These are just observations in case issues arise in the future with EMI or harmonics. It's not likely since these are small motors.
-	-	Hoist/Trolley molded cables freely dangle down to the hoist control interface without any tie down. There are not any obvious ways this cable can be damaged as-is	No – I don't know if there's a good way to anchor this cable, but it may be worth having signage that reminds an operator to check that the cable isn't hung up on any equipment before any recipe is started

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

IP ADDRESS:
192.168.200.105

HMI7081

IP ADDRESS:
192.168.200.90

VPN8181

IP ADDRESS:
192.168.200.100

PLC 13001

BULK BAG #1 HARDY
IP ADDRESS:
192.168.200.120

WC21001

BULK BAG #2 HARDY
IP ADDRESS:
192.168.200.121

WC22001

DUMP STATION HARDY
IP ADDRESS:
192.168.200.122

WC22001

ENET–8042

ENET–8051

ENET–8052

ENET–8061

ENET–8071

ENET–8041

IP: 192.168.200.101
SUBNET: 255.255.255.0
GW: 0.0.0.0

PORT 8
PORT 7
PORT 6
PORT 5
PORT 4
PORT 1
PORT 2
PORT 3
PORT 9
PORT 10
PORT 11
PORT 12
PORT 13
PORT 14
PORT 15
PORT 16

ES8001

ENET–8032

PORT6071

ENET–8021

ENET–8022

ENET–8031

ENET–8062

VFD2011

TUBULAR CONVEYOR
IP ADDRESS:
192.168.200.110

VFD3011

INLET ROTARY
VALVE #1
IP ADDRESS:
192.168.200.111

VFD4011

INLET ROTARY
VALVE #2
IP ADDRESS:
192.168.200.112

VFD4191

DUMPER STATION INLET
ROTARY VALVE
IP ADDRESS:
192.168.200.113

HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343–1675 FAX (269) 349–2477

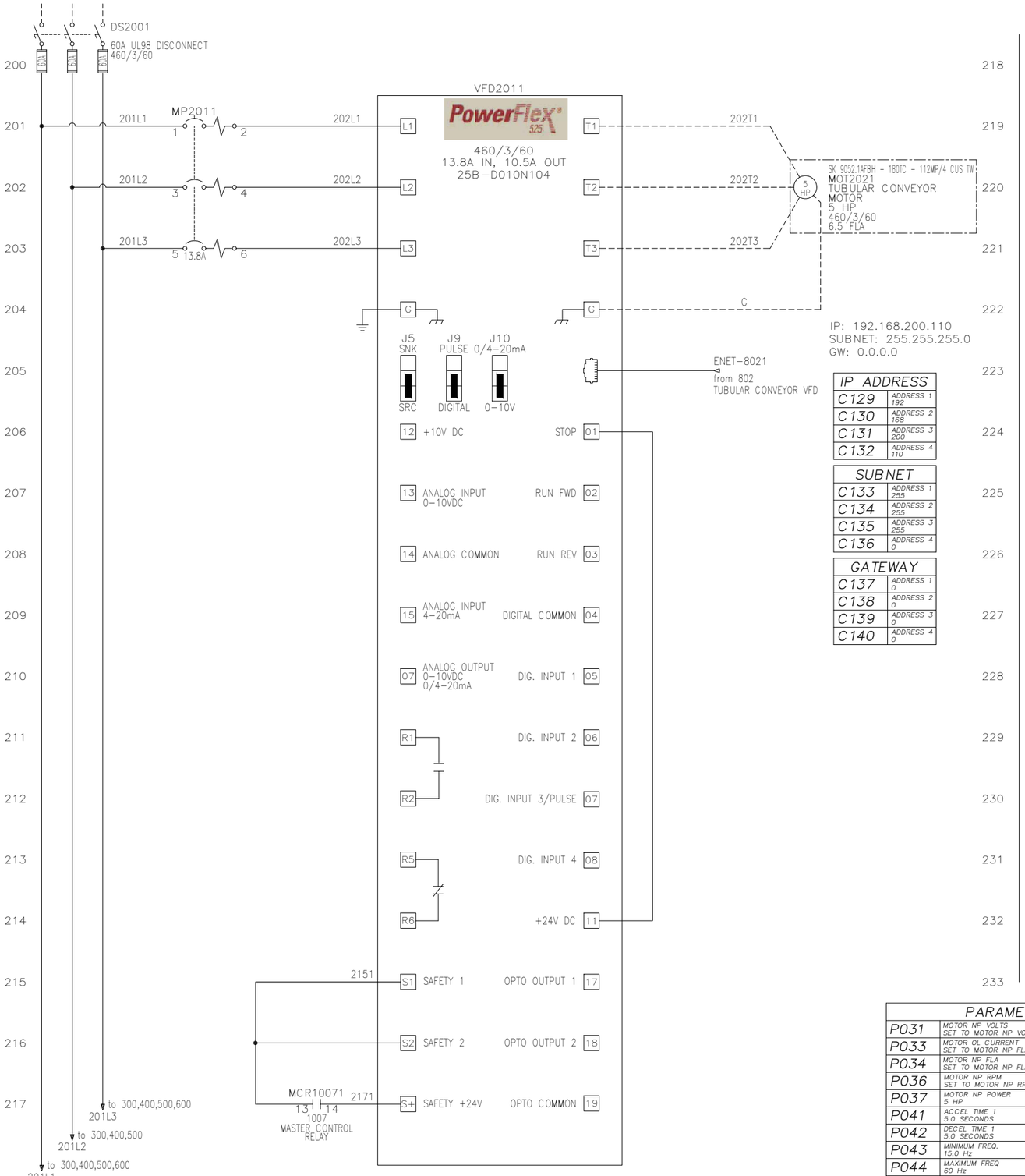
DATE 4/10/23	JOB NO. H20319–DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
NETWORK WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
1	27	H20319DA–B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



IP ADDRESS	
C129	ADDRESS 1 192
C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 110

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P031	MOTOR NP VOLTS SET TO MOTOR NP VOLTS
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P036	MOTOR NP RPM SET TO MOTOR NP RPM
P037	MOTOR NP POWER 5 HP
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15.0 Hz
P044	MAXIMUM FREQ 60 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP
t070	OPTO OUT1 LEVEL 52%

PARAMETER SETTINGS	
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETYFLT RSTCFG 1 – FLTCLR RESET
A431	JOG FREQUENCY 15.0 Hz
A432	JOG ACCEL/DECEL 5.0 SECONDS
A486	SHEAR PIN1 LEVEL 5.5A
A487	SHEAR PIN 1 TIME 0.10s
A490	LOAD LOSS LEVEL HAPMAN TO SET TO DESIRED LEVEL
A491	LOAD LOSS TIME 1.0s
C128	EN ADDR SEL 1 – PARAMETERS
—	– –
—	– –
—	– –
—	– –

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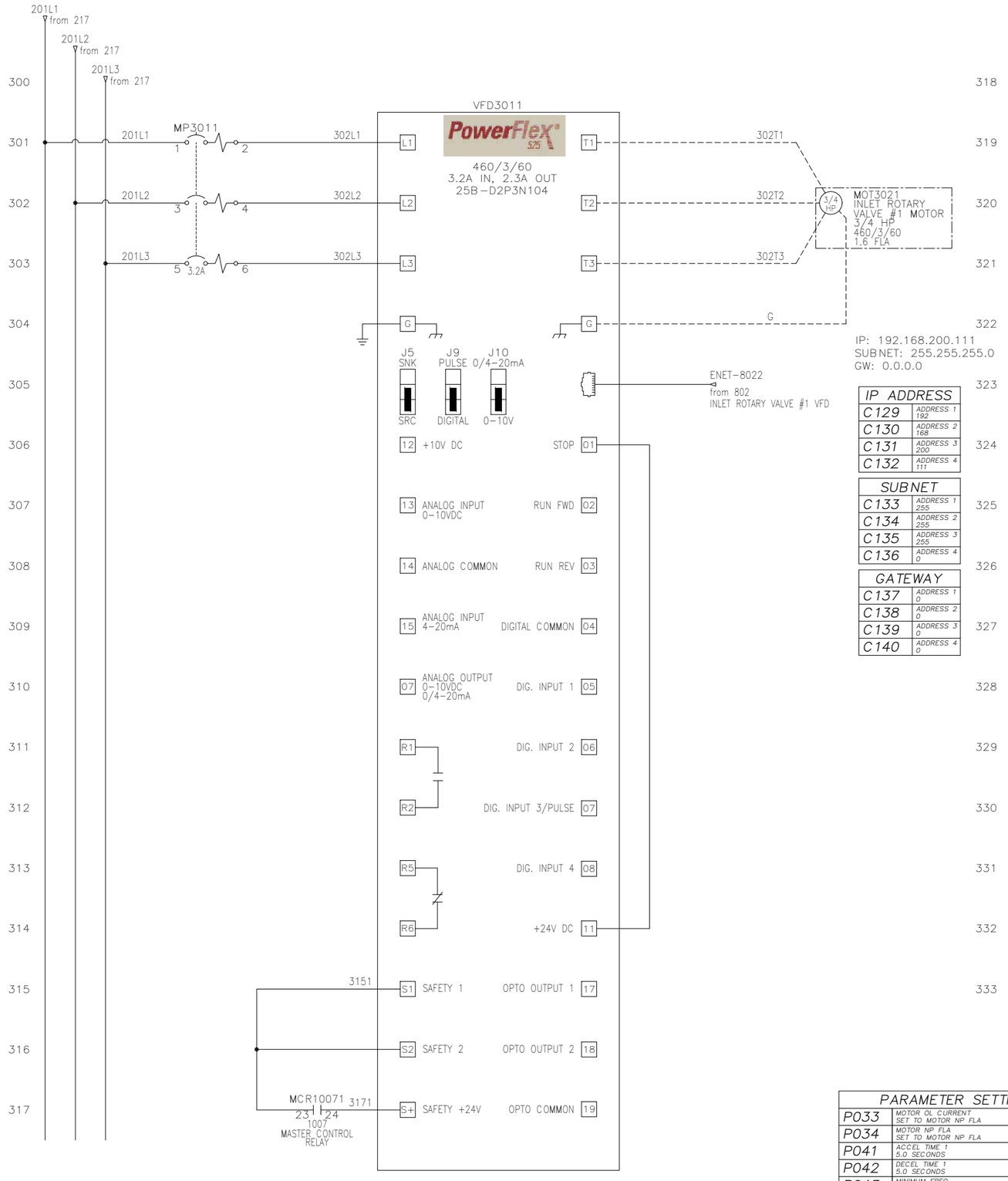
DATE	4/10/23	JOB NO.	H20319-DA, HA & LA	DRAWN	MRL
SCALE	N/A			BOM = 1	DWG = 1

TITLE
MOTOR WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
2	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



IP ADDRESS	
C129	ADDRESS 1 192
C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 111

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP

PARAMETER SETTINGS	
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETY FAULT RESET 1 – FAULT CLEAR RESET
C128	EN ADDR SEL 1 – PARAMETERS
–	– –
–	– –
–	– –
–	– –
–	– –

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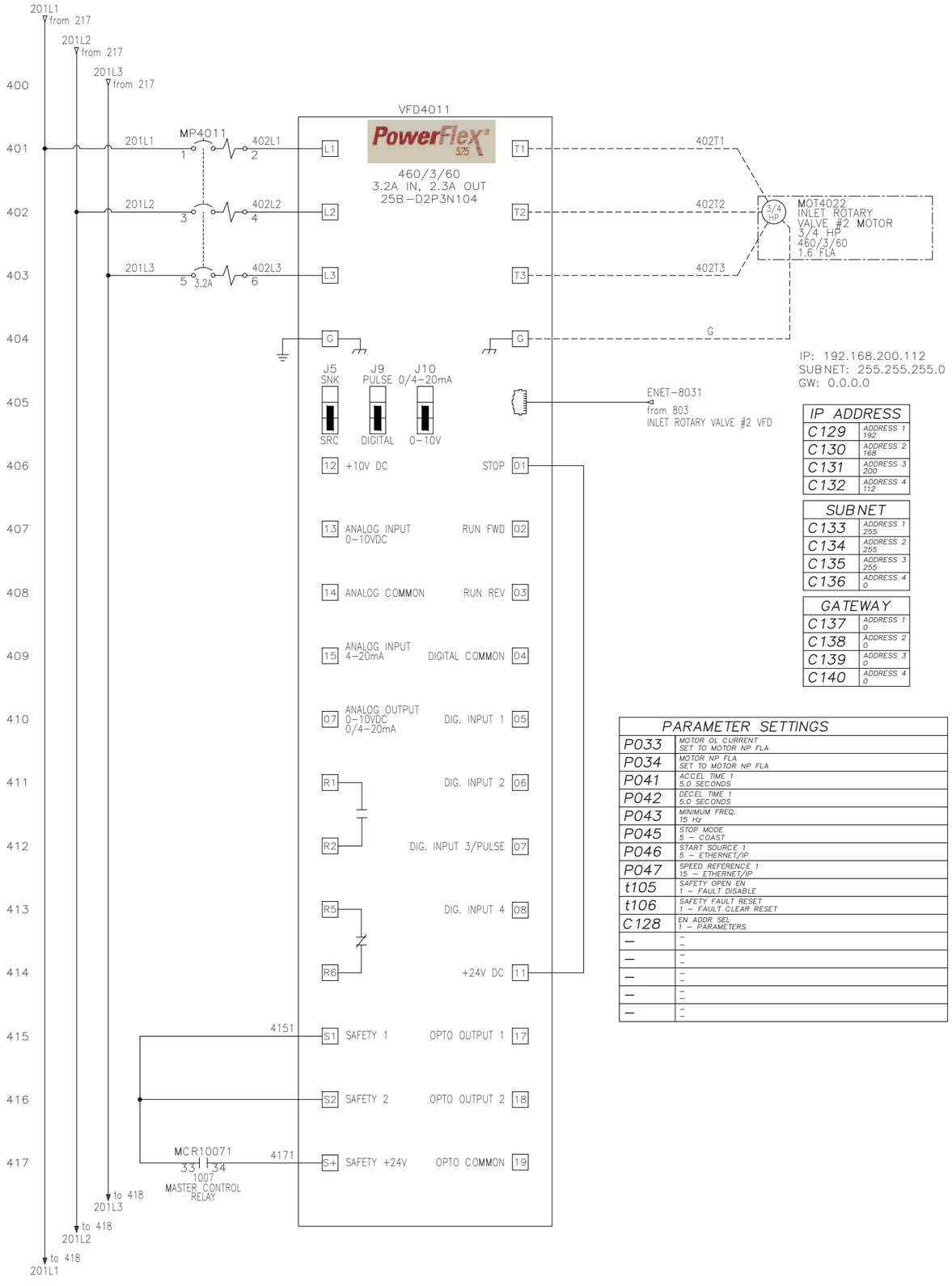
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
MOTOR WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET 3 OF 27	DWG. NO. H20319DA-B00	REV. 0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



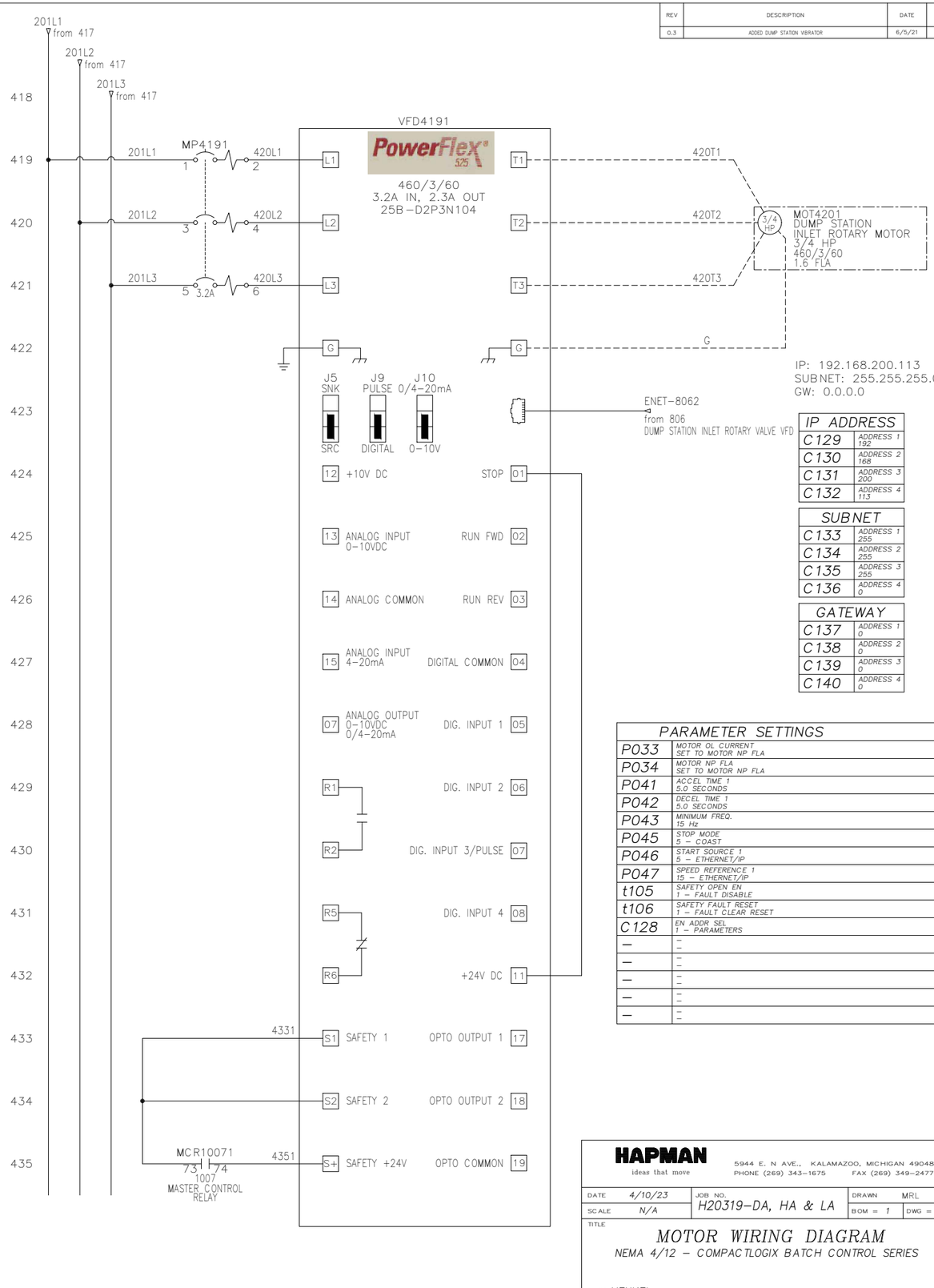
IP: 192.168.200.112
SUBNET: 255.255.255.0
GW: 0.0.0.0

IP ADDRESS	
C129	ADDRESS 1 192
C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 112

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETY FAULT RESET 1 – FAULT CLEAR RESET
C128	EN ADDR SEL 1 – PARAMETERS
–	– –
–	– –
–	– –
–	– –
–	– –



IP: 192.168.200.113
SUBNET: 255.255.255.0
GW: 0.0.0.0

IP ADDRESS	
C129	ADDRESS 1 192
C130	ADDRESS 2 168
C131	ADDRESS 3 200
C132	ADDRESS 4 113

SUBNET	
C133	ADDRESS 1 255
C134	ADDRESS 2 255
C135	ADDRESS 3 255
C136	ADDRESS 4 0

GATEWAY	
C137	ADDRESS 1 0
C138	ADDRESS 2 0
C139	ADDRESS 3 0
C140	ADDRESS 4 0

PARAMETER SETTINGS	
P033	MOTOR OL CURRENT SET TO MOTOR NP FLA
P034	MOTOR NP FLA SET TO MOTOR NP FLA
P041	ACCEL TIME 1 5.0 SECONDS
P042	DECEL TIME 1 5.0 SECONDS
P043	MINIMUM FREQ. 15 Hz
P045	STOP MODE 5 – COAST
P046	START SOURCE 1 5 – ETHERNET/IP
P047	SPEED REFERENCE 1 15 – ETHERNET/IP
t105	SAFETY OPEN EN 1 – FAULT DISABLE
t106	SAFETY FAULT RESET 1 – FAULT CLEAR RESET
C128	EN ADDR SEL 1 – PARAMETERS
–	– –
–	– –
–	– –
–	– –
–	– –

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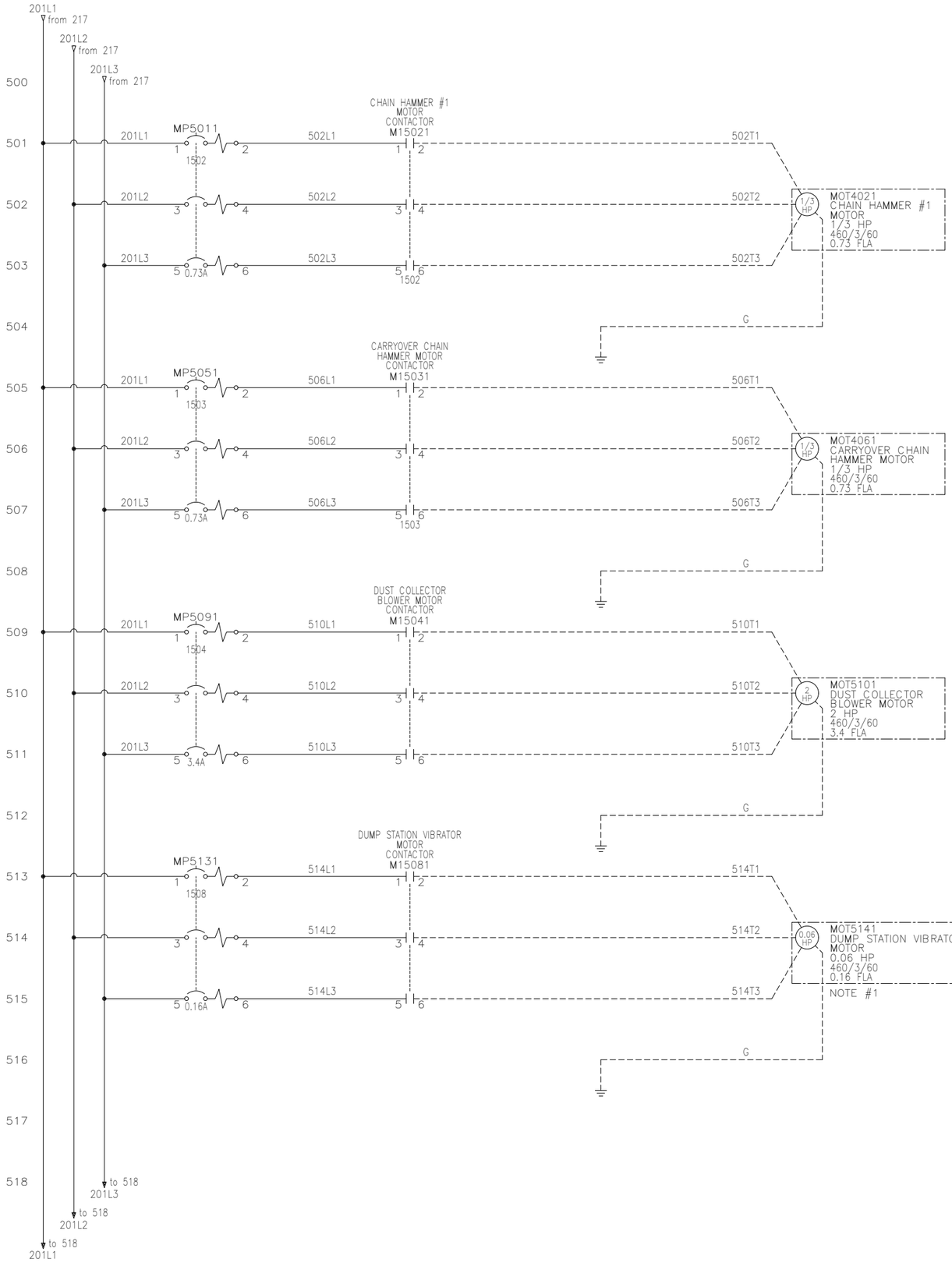
DATE	4/10/23	JOB NO.	H20319-DA, HA & LA	DRAWN	MRL
SCALE	N/A			BOM = 1	DWG = 1

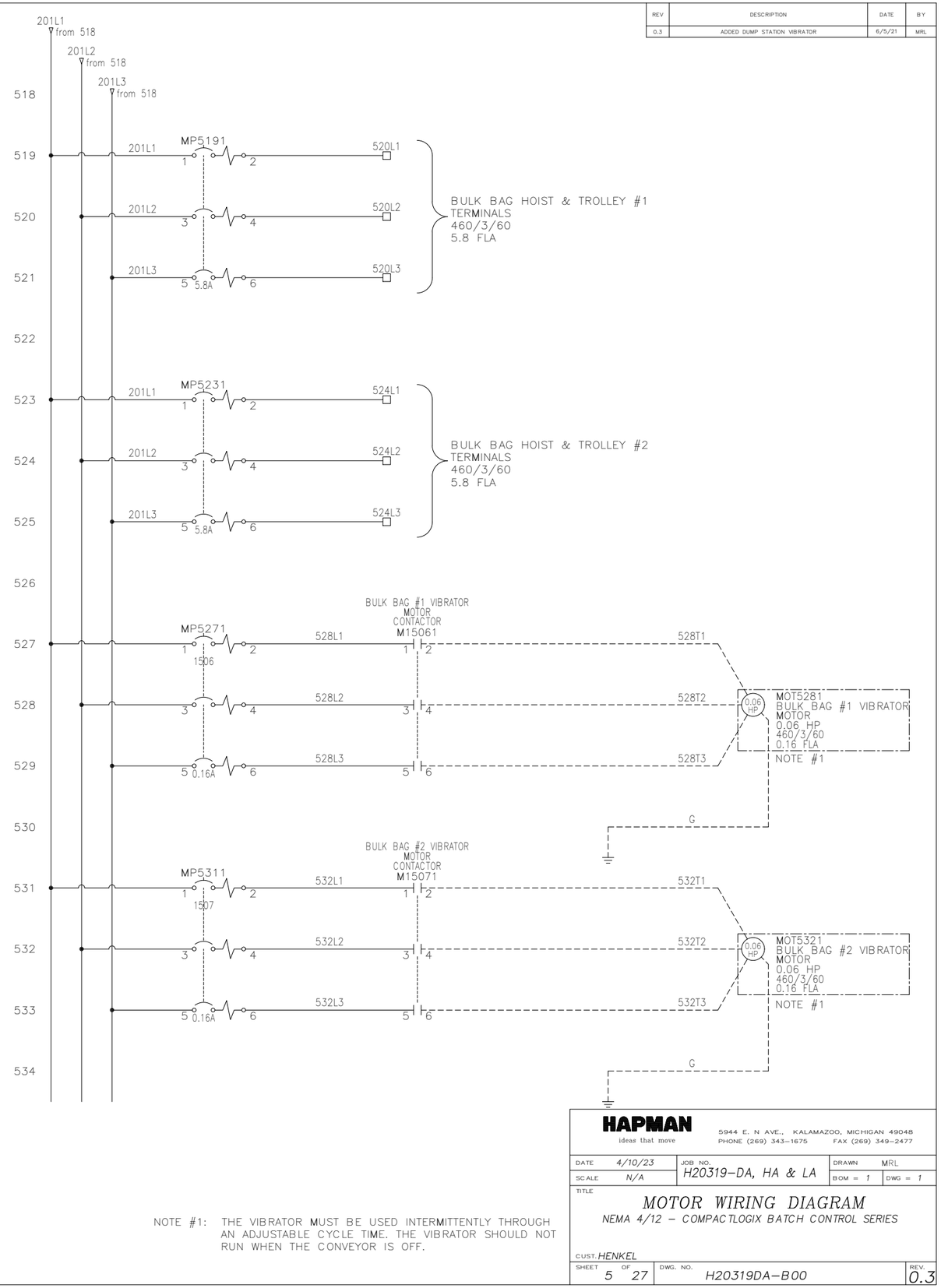
TITLE
MOTOR WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
4	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





NOTE #1: THE VIBRATOR MUST BE USED INTERMITTENTLY THROUGH AN ADJUSTABLE CYCLE TIME. THE VIBRATOR SHOULD NOT RUN WHEN THE CONVEYOR IS OFF.

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DATE	JOB NO.	DRAWN
4/10/23	H20319-DA, HA & LA	MRL
SCALE N/A		BOM = 1 / DWG = 1

TITLE

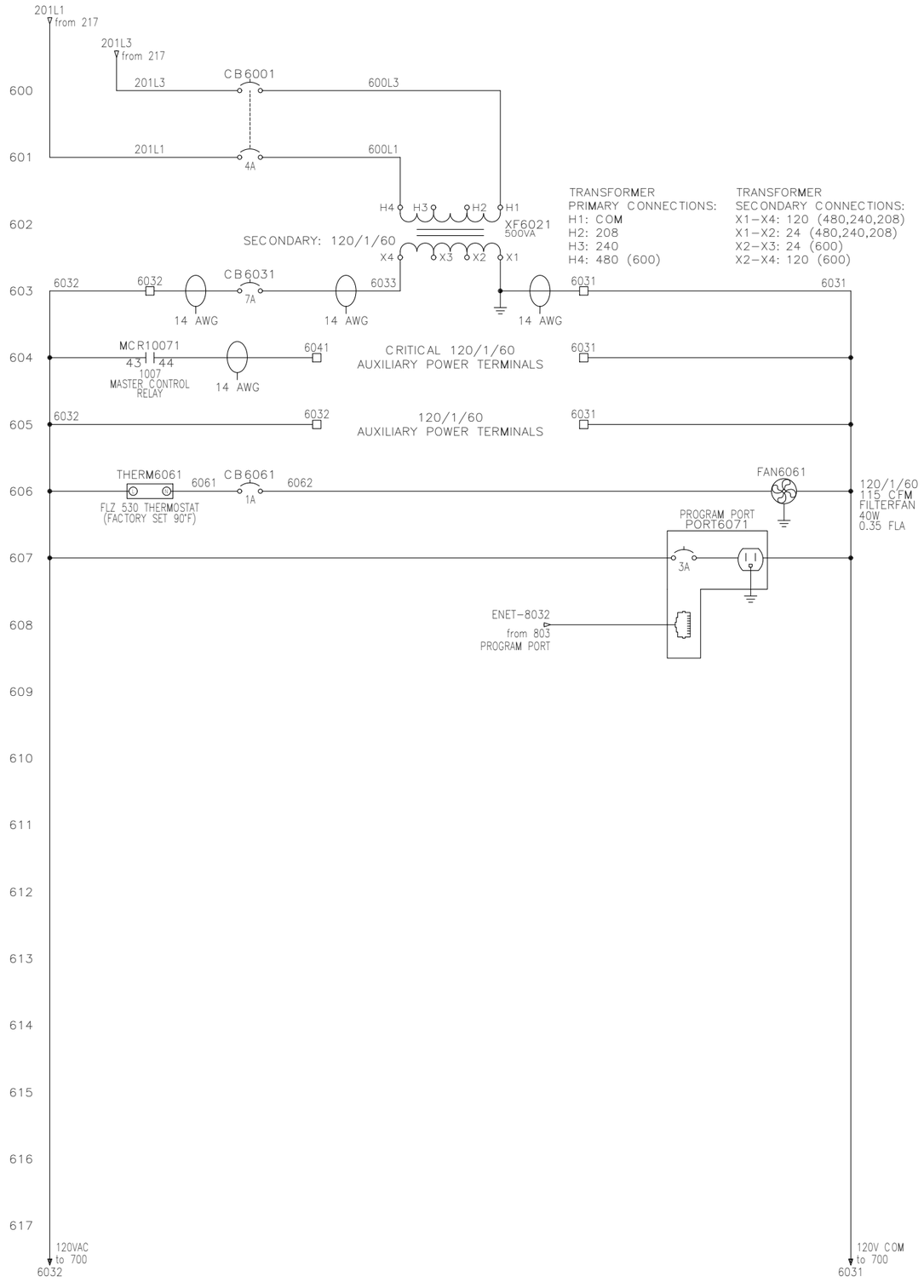
MOTOR WIRING DIAGRAM

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
5	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343–1675 FAX (269) 349–2477

DATE 4/10/23	JOB NO. H20319–DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

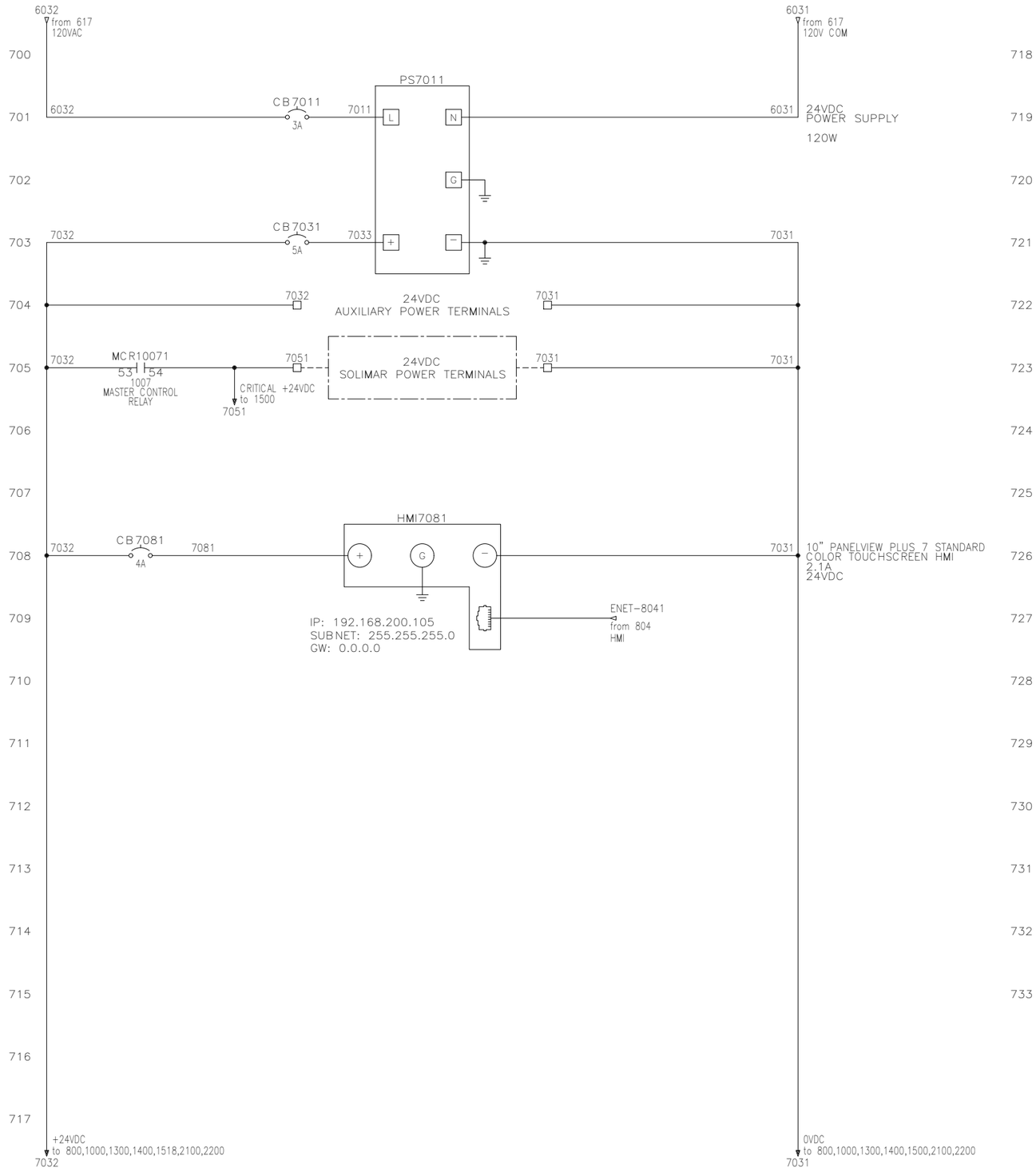
120VAC WIRING DIAGRAM

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	DWG. NO.	REV.
6 OF 27	H20319DA–B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

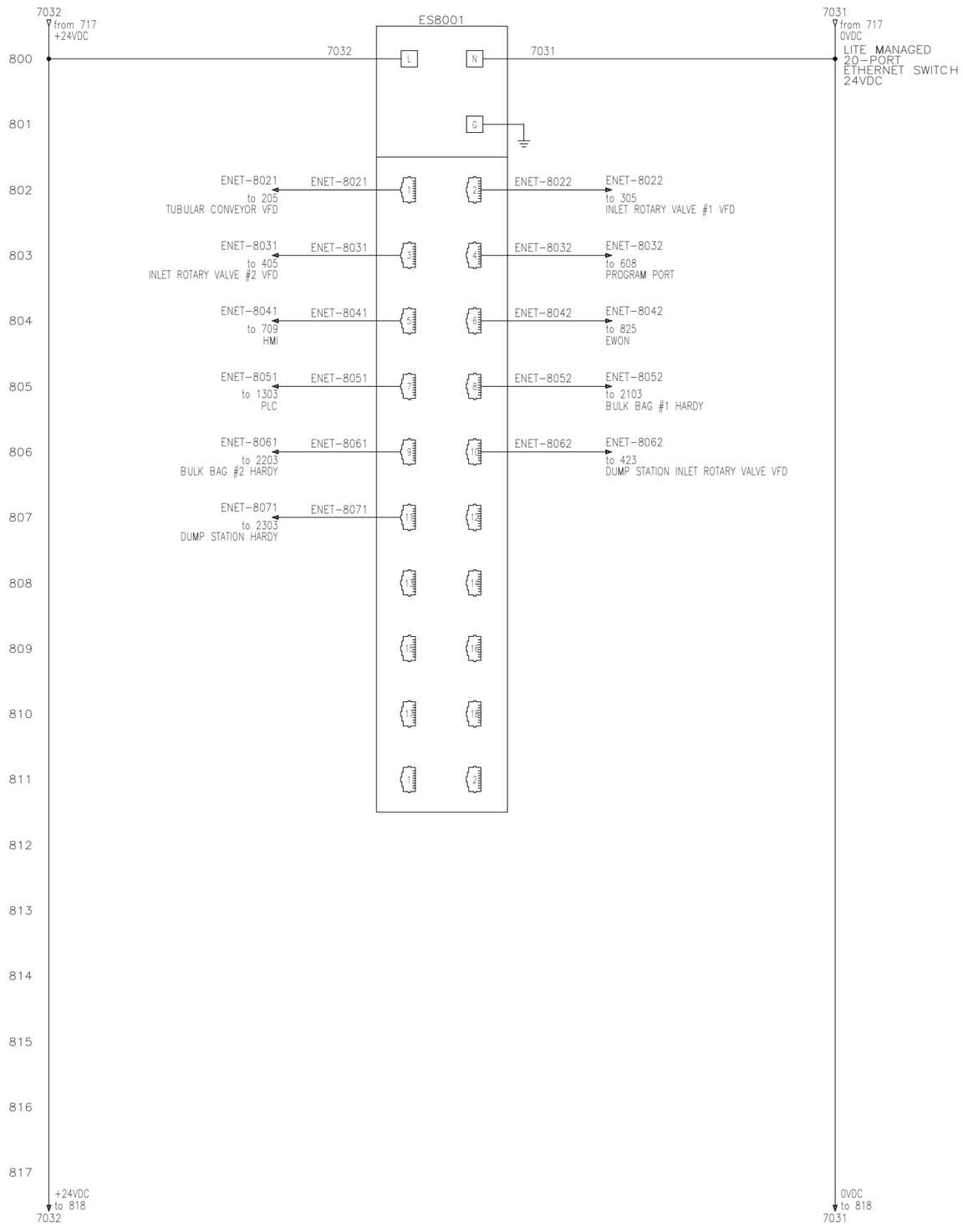
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

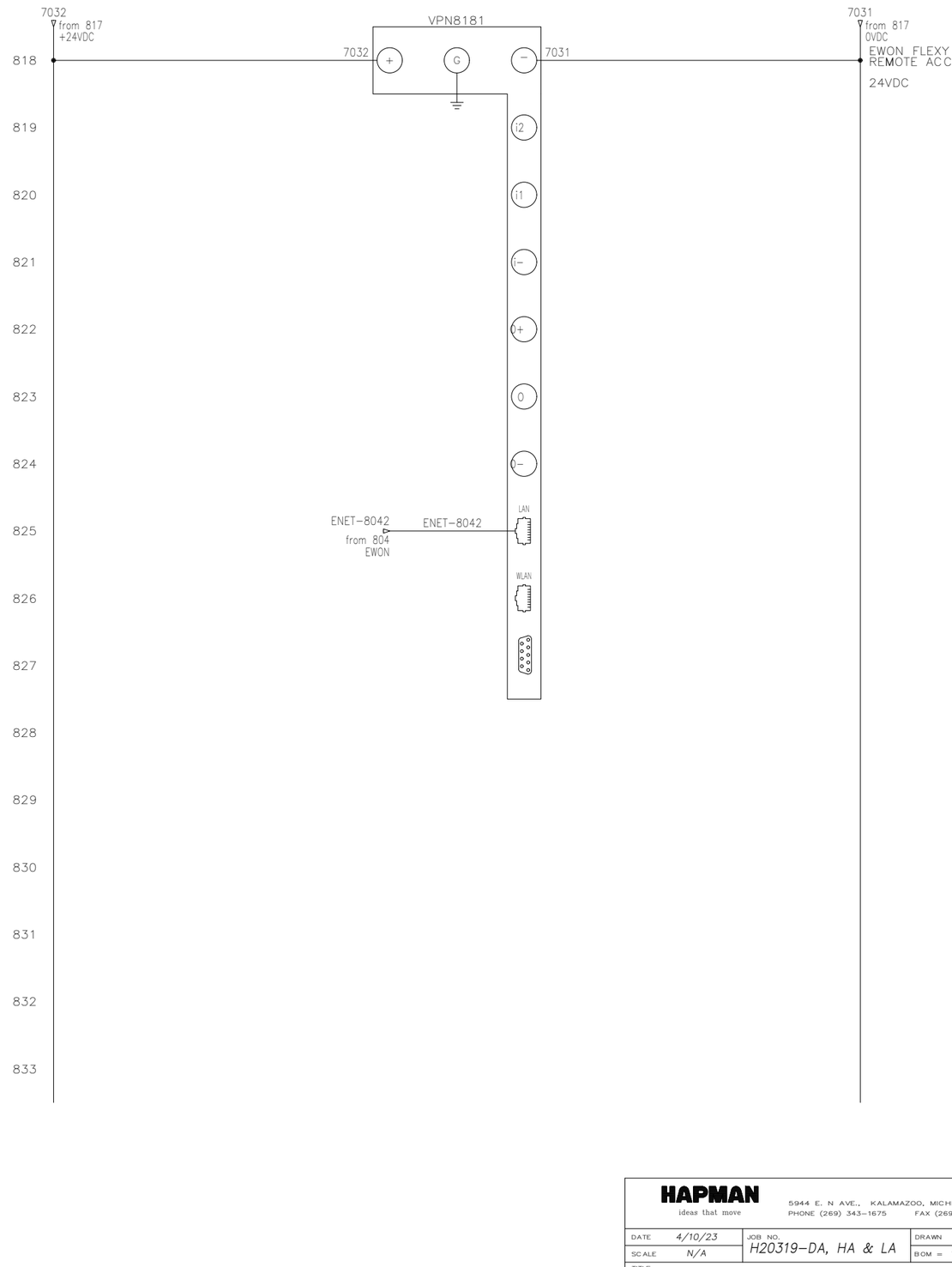
TITLE
24VDC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
7	27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
24VDC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET 8 OF 27	DWG. NO. H20319DA-B00	REV. 0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

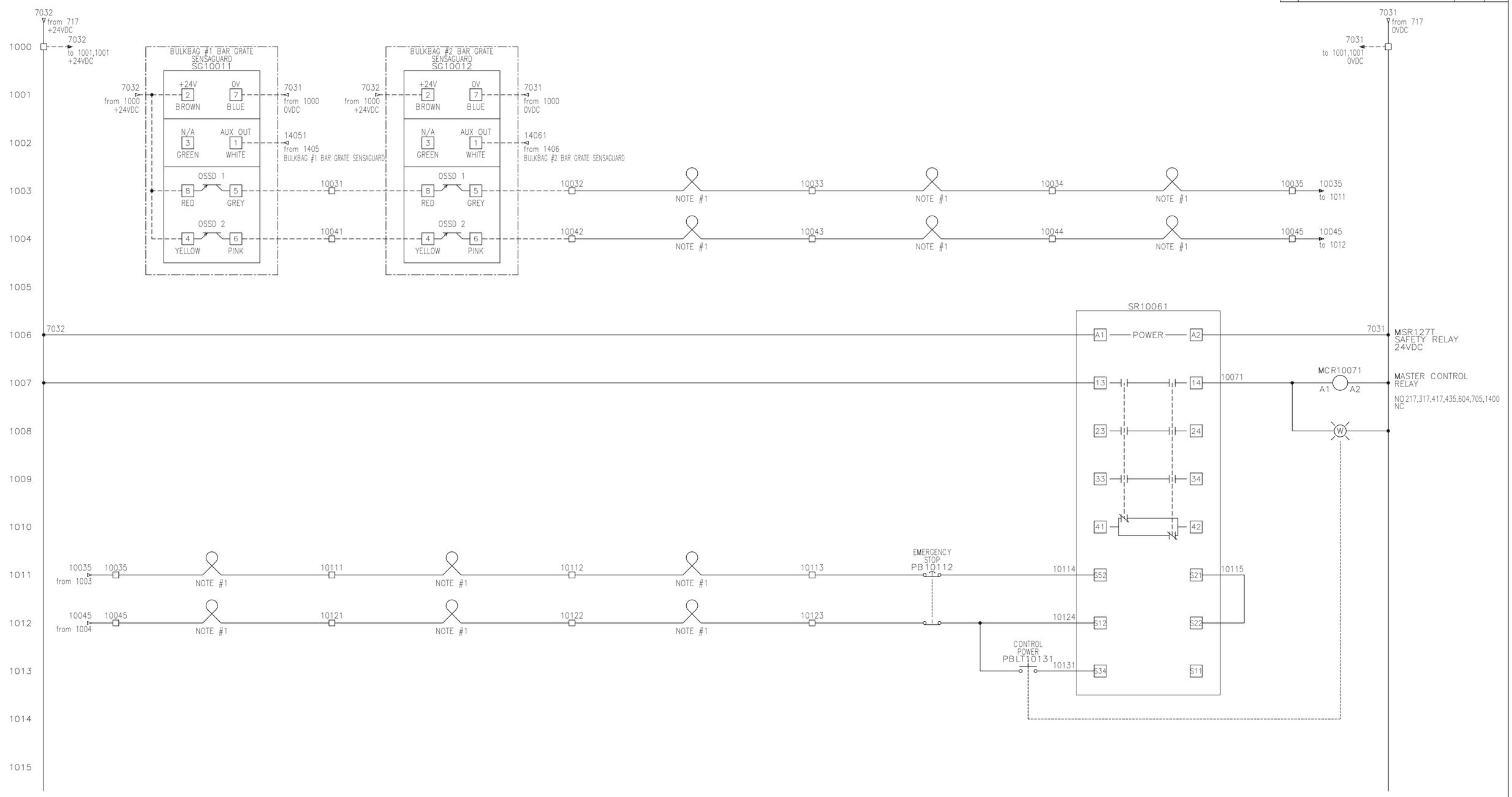
RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET	DWG. NO.	REV.
9 OF 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



NOTES:
1. REMOVE JUMPER IF CIRCUIT IS UTILIZED

HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
SAFETY RELAY WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
10 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
11 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
RESERVED
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

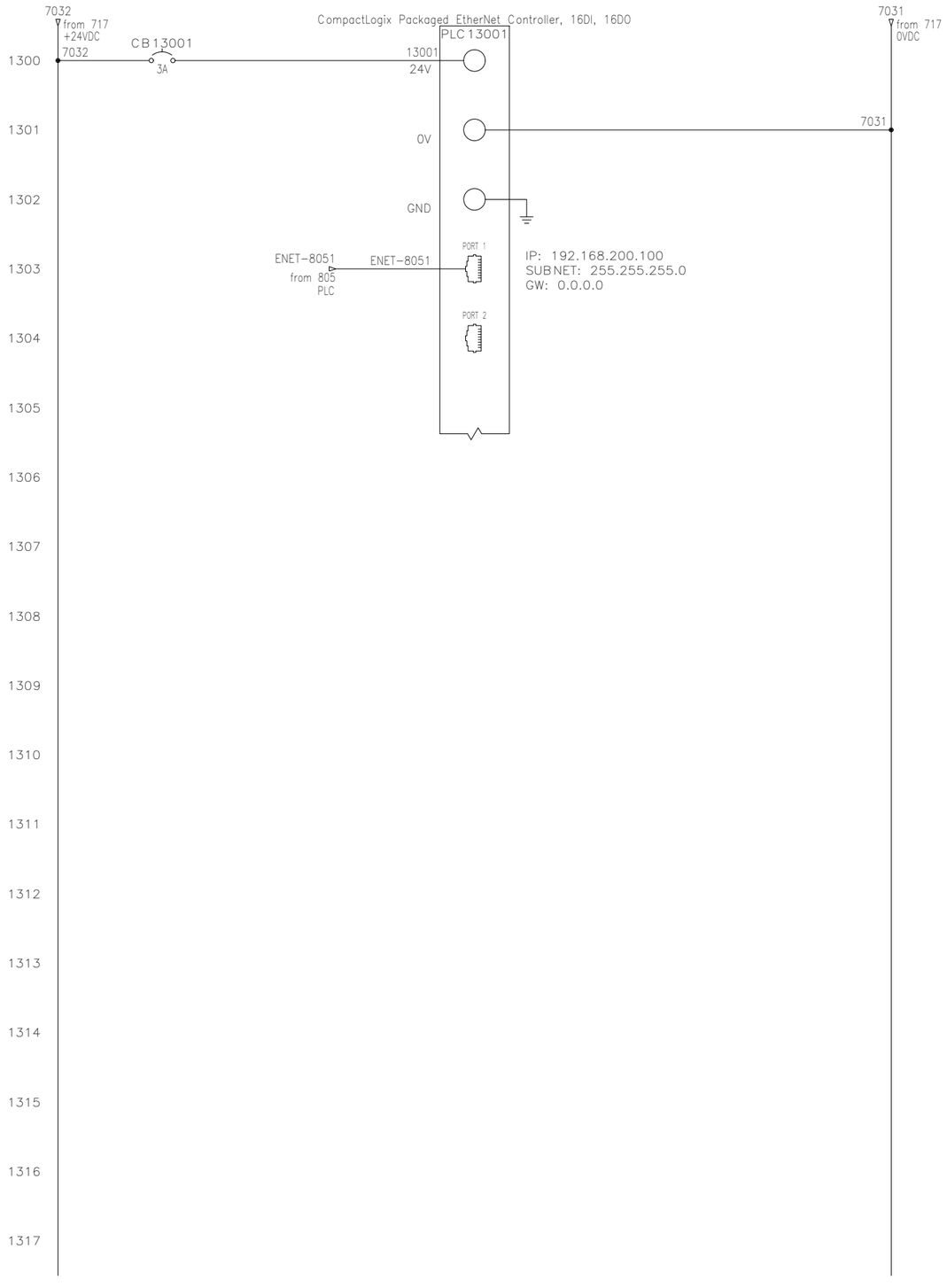
CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
12 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

Allen-Bradley
1769-L24ER-QB1B

CompactLogix Packaged EtherNet Controller, 16DI, 16DO



HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

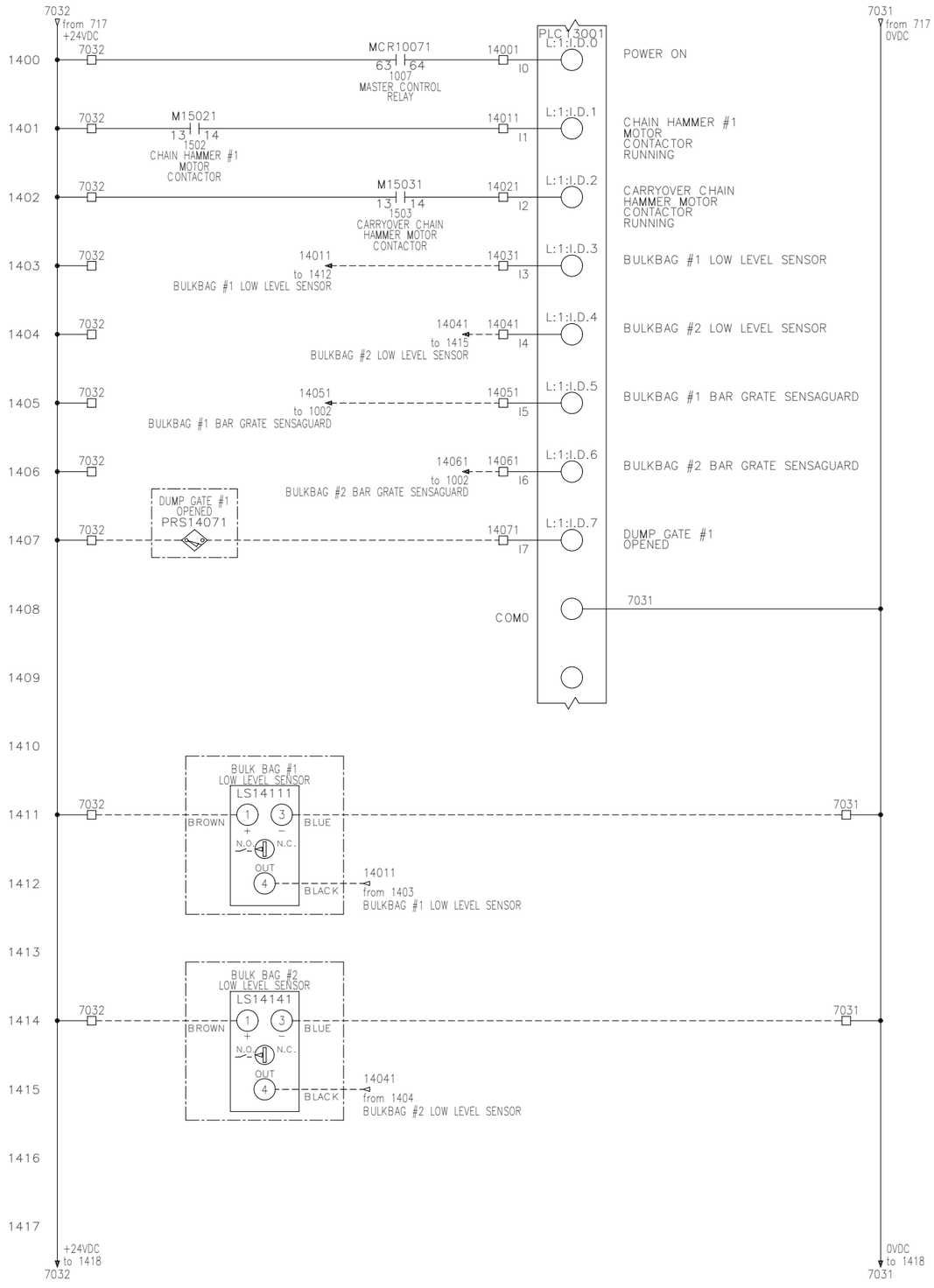
PLC WIRING DIAGRAM

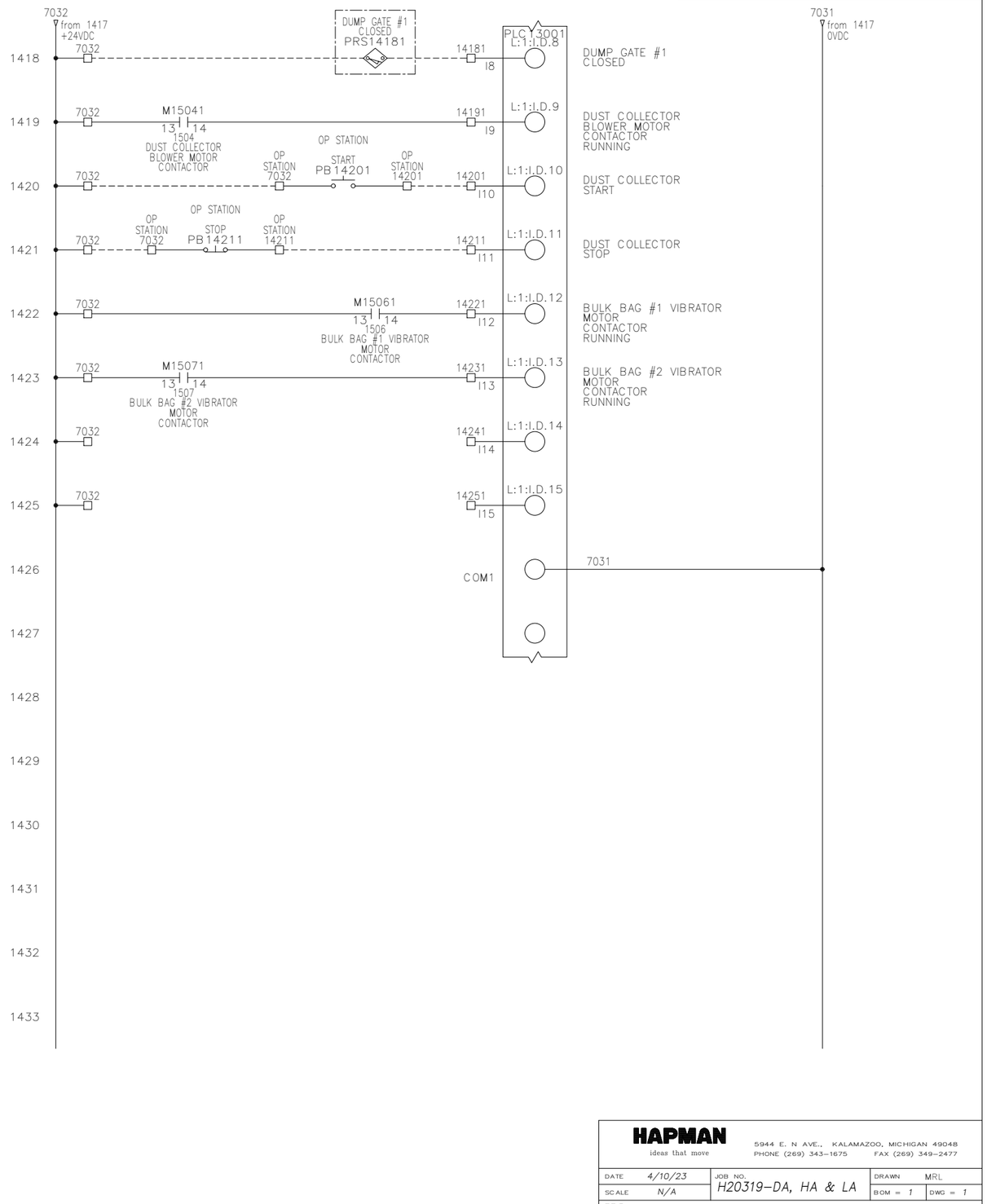
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
13 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

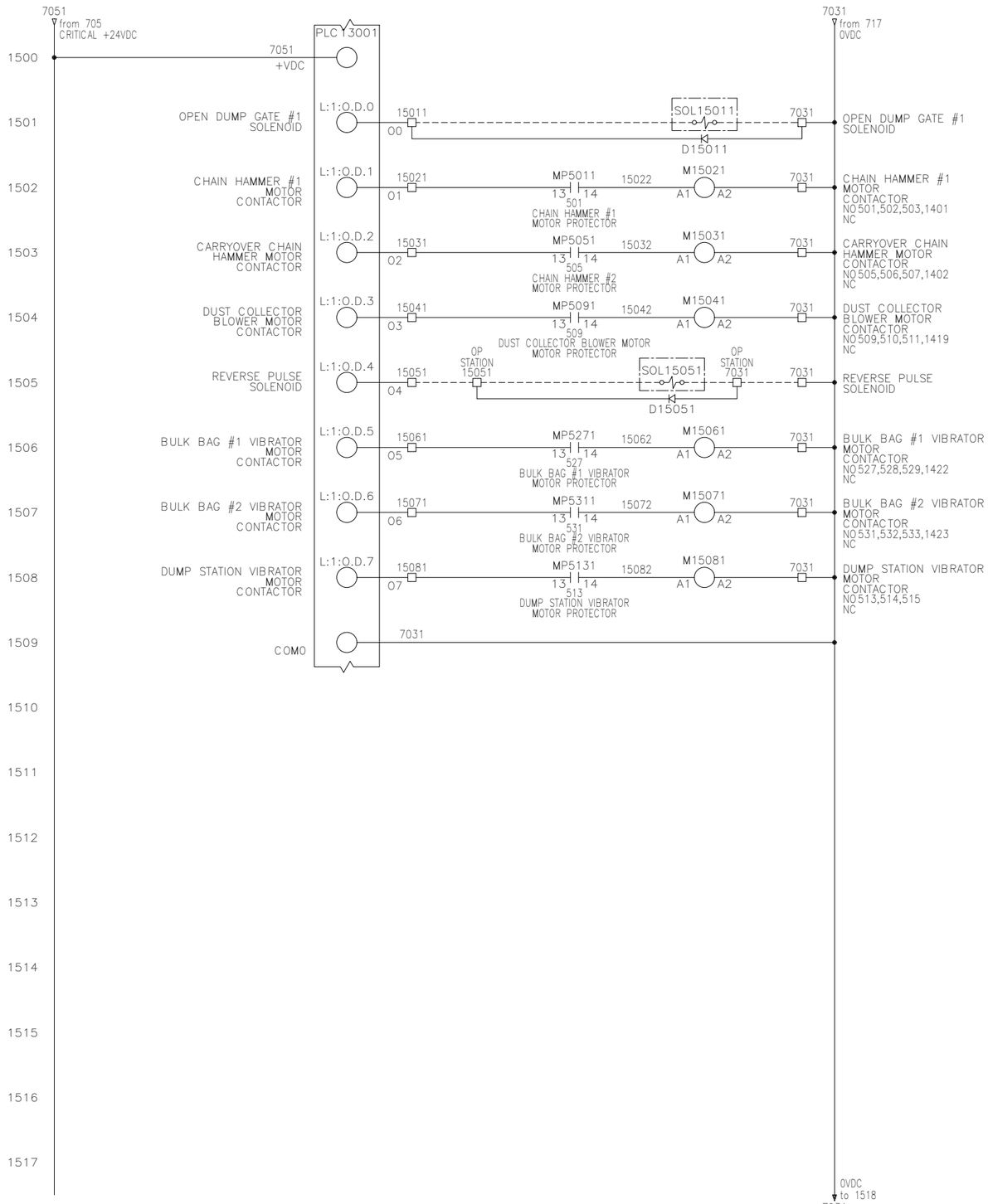
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

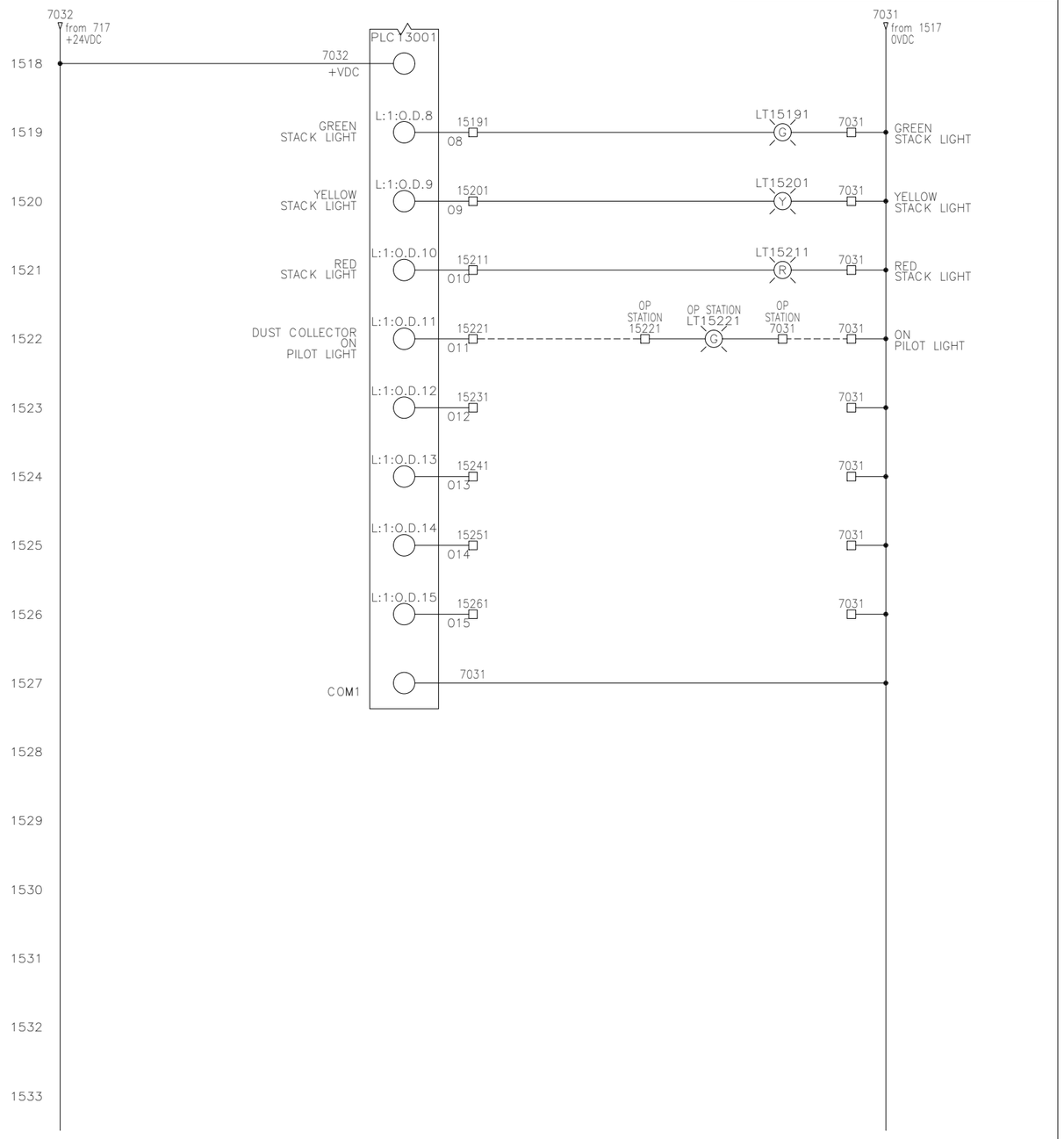
TITLE
PLC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
14 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
PLC WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
15 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
RESERVED
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
16 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
17 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
18 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
19 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

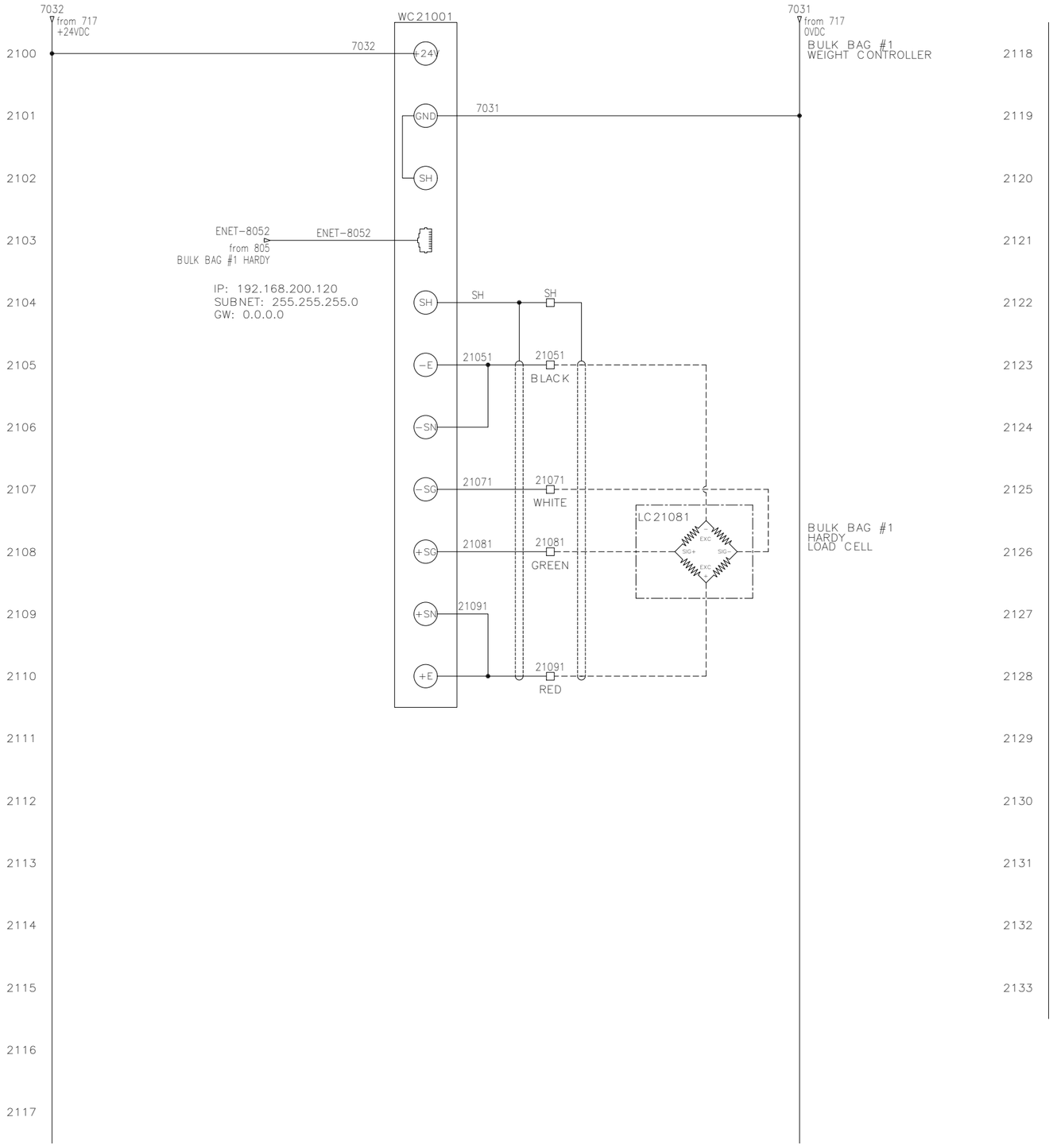
RESERVED

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. *HENKEL*

SHEET OF	DWG. NO.	REV.
20 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

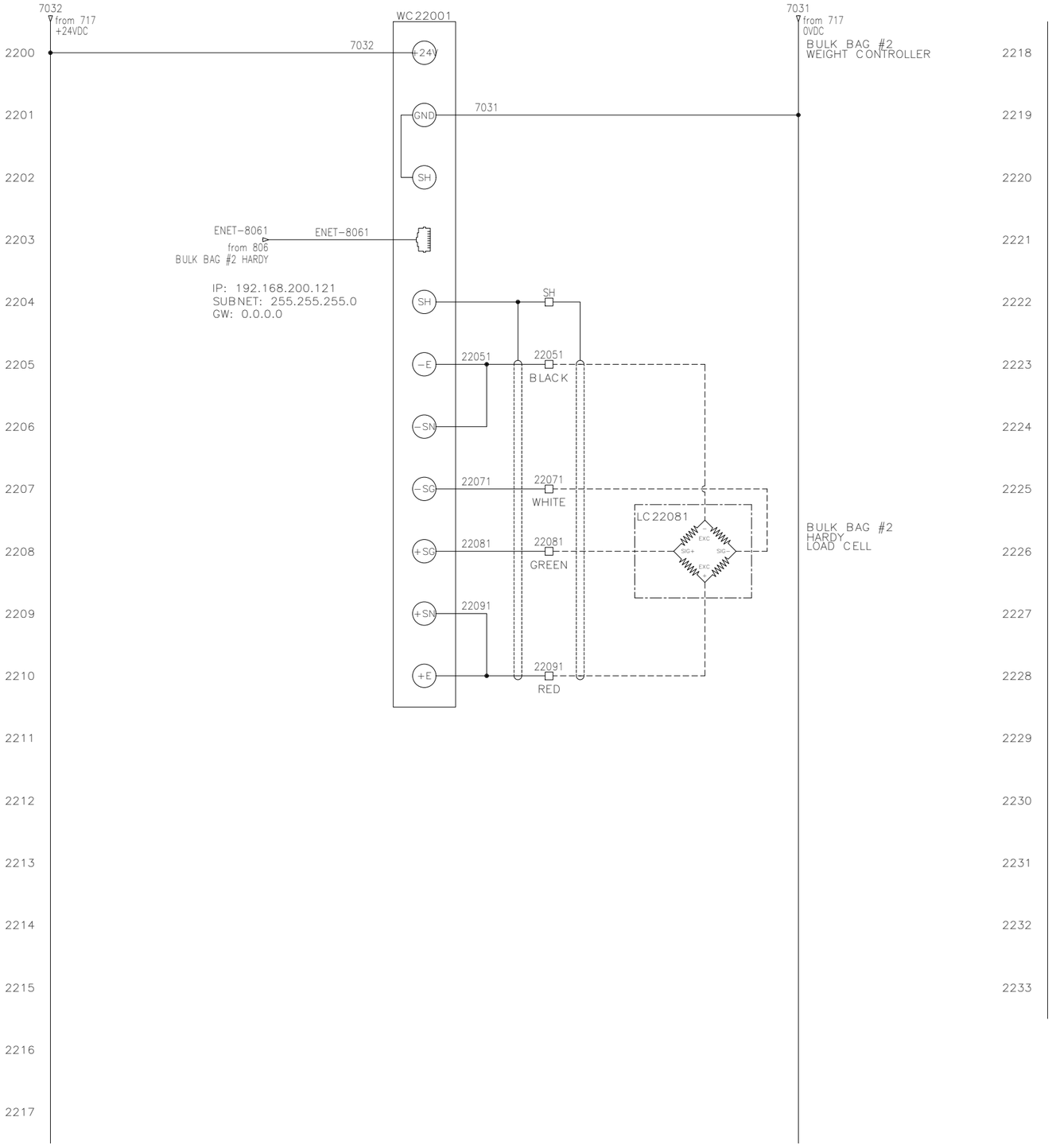
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
HARDY WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
21 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

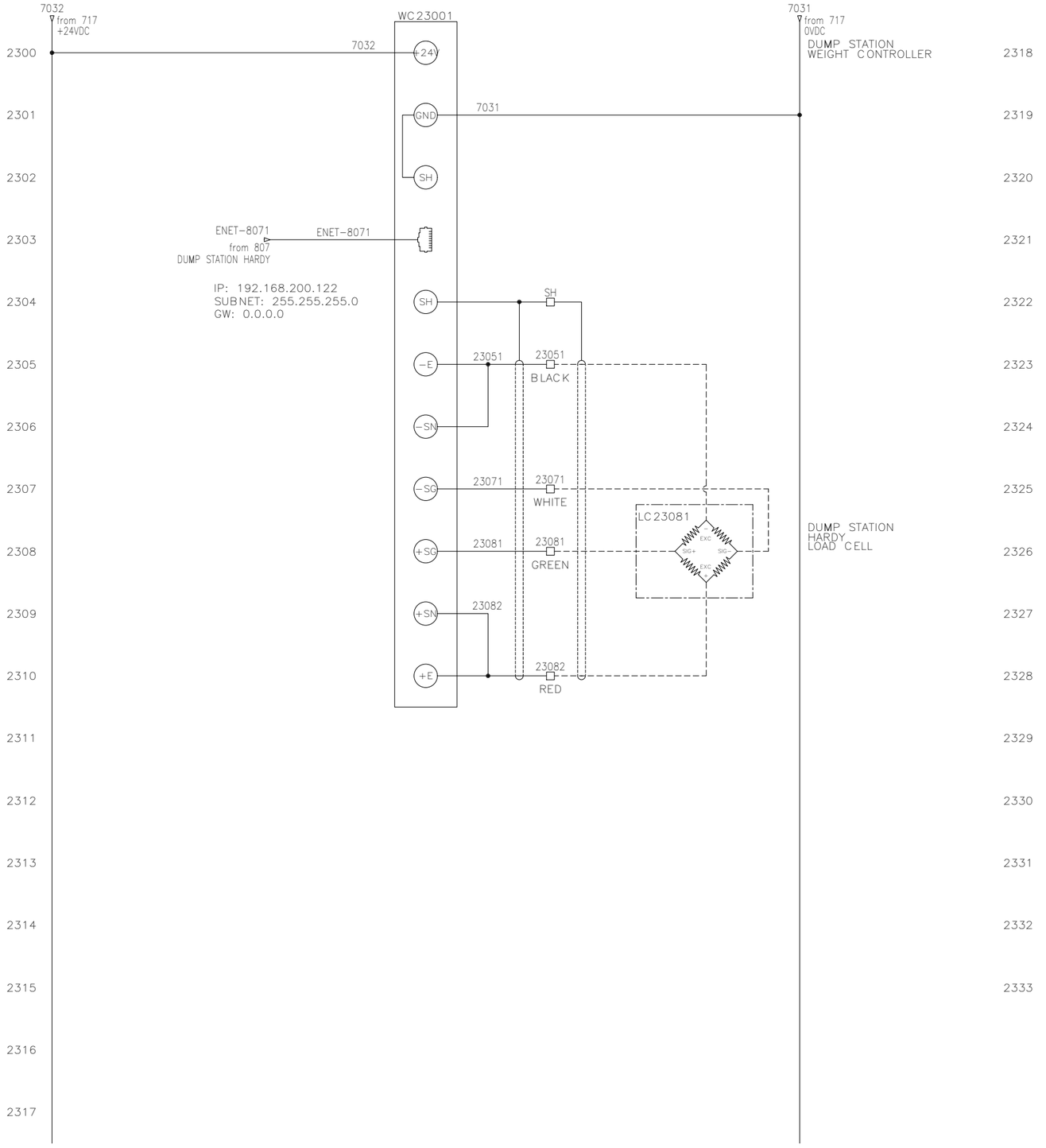
DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE
HARDY WIRING DIAGRAM
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
22 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

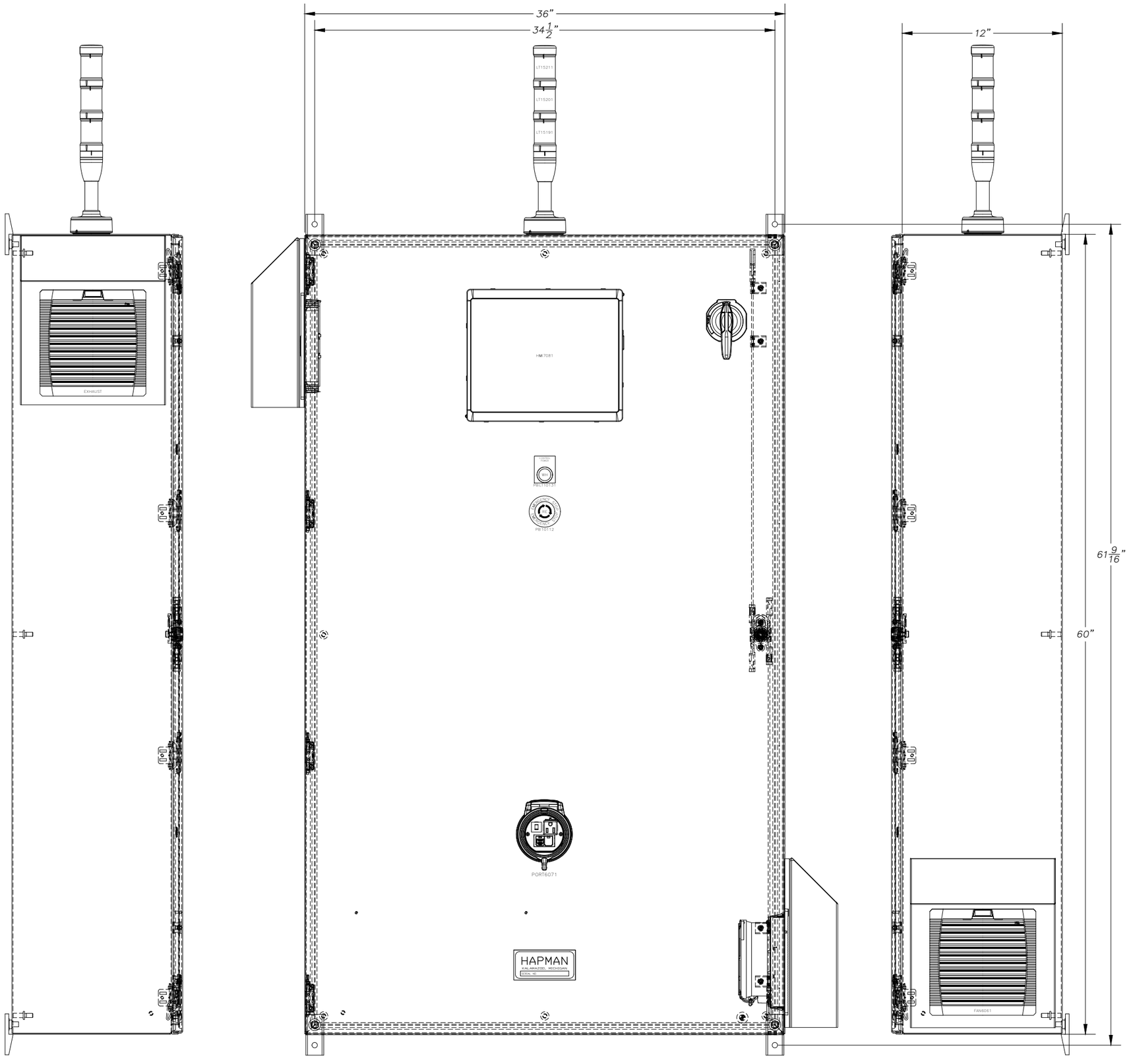
HARDY WIRING DIAGRAM

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
23 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE

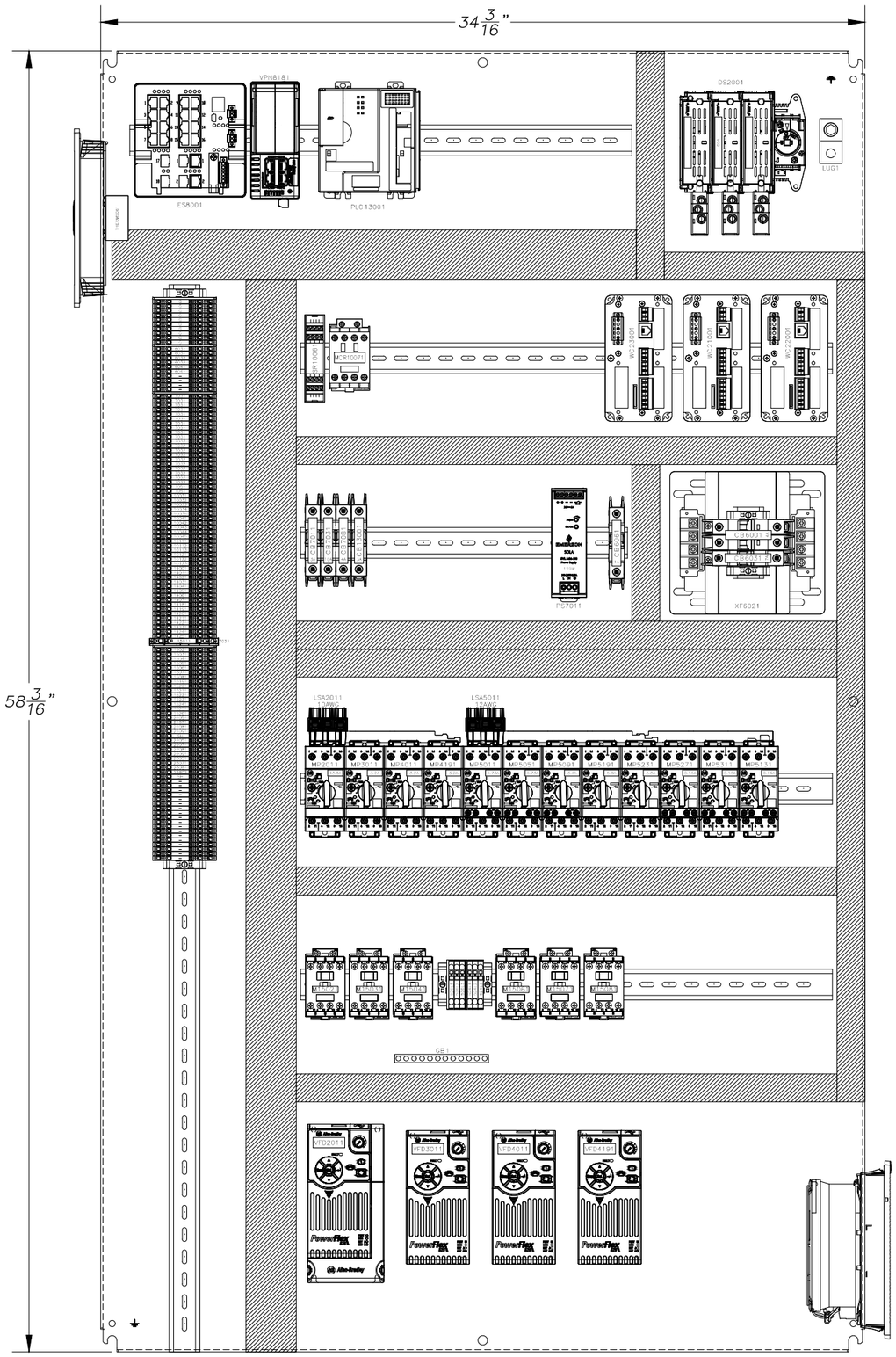
ENCLOSURE LAYOUT

NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
24 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL



VOLTAGE:	460 VOLT
PHASE & FREQ.:	3PH., 60HZ
FULL LOAD CURRENT:	41 AMP
S.C.C.R.:	10k AMP
ENCLOSURE RATING:	TYPE 4
SCHEMATIC:	H20319DA-B00
MFG. BY:	KMC Global Controls & Automation

HAPMAN
ideas that move

5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE 4/10/23	JOB NO. H20319-DA, HA & LA	DRAWN MRL	
SCALE N/A		BOM = 1	DWG = 1

TITLE:

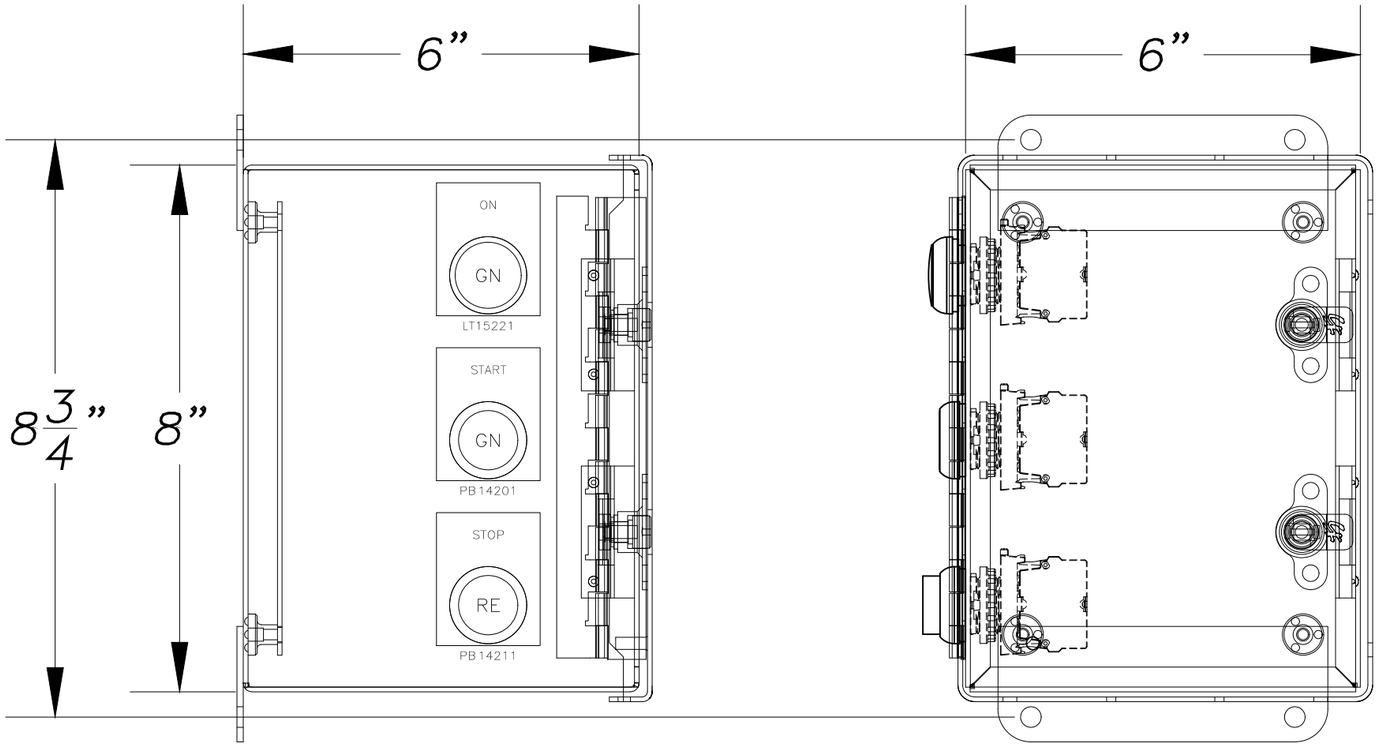
SUB PANEL LAYOUT

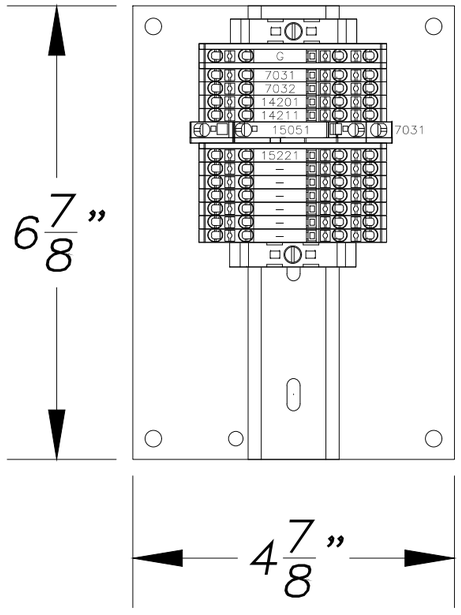
NEMA 4/12 - COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
25 27	H20319DA-B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL





DUST COLLECTOR OP STATION	
VOLTAGE:	24VDC
FULL LOAD CURRENT:	1 AMP
ENCLOSURE RATING:	TYPE 4
SCHEMATIC:	H20319DA–B00
MFG. BY:	KMC Global Controls & Automation

HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343–1675 FAX (269) 349–2477

DATE	JOB NO.	DRAWN
4/10/23	H20319–DA, HA & LA	MRL
SCALE N/A		BOM = 1 / DWG = 1

TITLE
DUST COLLECTOR OP STATION LAYOUT
NEMA 4/12 – COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET OF	DWG. NO.	REV.
26 27	H20319DA–B00	0.3

REV	DESCRIPTION	DATE	BY
0.3	ADDED DUMP STATION VIBRATOR	6/5/21	MRL

ITEM	QTY	PART #	MANUFACTURE	DESCRIPTION	DESCRIPTOR
1	1	CSD603612	HOFFMAN	60"x36"x12" NEMA 4/12 ENCLOSURE	.
2	1	CP6036G	HOFFMAN	GALVANIZED SUB PANEL	.
3	1	CMFK	HOFFMAN	FOOT KIT	.
4	1	194R-J60-1753-PYS1	AB	60A FUSIBLE ROTARY DISCONNECT KIT 12" SHAFT W/ HANDLE	DS2001
5	3	194R-60-MTL3	AB	LUG, MULTI-TAP 60A 3 POINT 4-14AWG	DS2001
6	3	LPJ-60SP	BUSSMANN	60A CLASS J FUSE	FU2001
7	1	LAMA2/0-14-QY	PANDUIT	LUG	LUG
8	1	140MT-C3E-C16	AB	10-16A MOTOR PROTECTOR	MP2011
9	2	140MT-C3E-B40	AB	2.5-4A MOTOR PROTECTOR	MP3011,4011
10	2	140MT-C3E-B10	AB	0.63-1A MOTOR PROTECTOR	MP5011,5051
11	2	140MT-C3E-B63	AB	4-6.3A MOTOR PROTECTOR	MP5191,5231
12	3	140MT-C3E-A25	AB	0.16-0.25A MOTOR PROTECTOR	MP5271,5311,MP5131
13	2	140MT-C-WTEN	AB	LINE SIDE ADAPTER	MP2011,5011
14	2	140MT-C-W454	AB	4 DEVICE, 3 PHASE COMMONING LINK	MP2011-4191,MP5231-5131
15	1	140MT-C-W455	AB	5 DEVICE, 3 PHASE COMMONING LINK	MP5011-5231
16	6	140MT-C-AFA20	AB	AUX CONTACT, FRONT MOUNT 2 NO	MP5011-5131
17	1	25B-D010N104	AB	10.5A 460V POWERFLEX 525 VFD	VFD2011
18	3	25B-D2P3N104	AB	2.3A 460V POWERFLEX 525 VFD	VFD3011,4011,4191
19	6	100-C09EJ10	AB	9A 24VDC IEC NON-REVERSING CONTACTOR	M15021-15071
20	1	1489-M2C040	AB	2 POLE 4A UL489 CIRCUIT BREAKER, C-CURVE	CB6001
21	1	E500JN	SOLA	500VA CPT	XF6021
22	1	IP20	SOLA	FINGERSAFE TERMINAL COVERS	XF6021
23	1	SBEDIN	SOLA	DIN CIRCUIT BREAKER MOUNTING	XF6021
24	1	1489-M1C070	AB	1 POLE 7A UL489 CIRCUIT BREAKER, C-CURVE	CB6031
25	1	1489-M1C010	AB	1 POLE 1A UL489 CIRCUIT BREAKER, C-CURVE	CB6061
26	1	17121000010	PFANNENBERG	FLZ 530 THERMOSTAT W/ N.O. SPRING CONTACT	THERM6061
27	1	11633156055	PFANNENBERG	120V 152 CFM PF33000 SL TYPE 12 FILTERFAN	FAN6061
28	1	11730004055	PFANNENBERG	PFA 30000 TYPE 12 EXHAUST FILTER	EXHAUST
29	2	18182000012	PFANNENBERG	FILTERFAN RAINHOOD TYPE 4	FAN6061,EXHAUST
30	1	DAP3BC-S3-6	PANDUIT	PROG. PORT, SIMPLEX OUTLET, RJ45, 3A CB	PORT6071
31	1	1489-M1C030	AB	1 POLE 3A UL489 CIRCUIT BREAKER, C-CURVE	CB7011
32	1	SVL 5-24-100	SOLA	24VDC 120W POWER SUPPLY	PS7011
33	1	1489-M1C050	AB	1 POLE 5A UL489 CIRCUIT BREAKER, C-CURVE	CB7031
34	1	1489-M1C040	AB	1 POLE 4A UL489 CIRCUIT BREAKER, C-CURVE	CB7081
35	1	2711P-T10C21D8S	AB	PANELVIEW PLUS 7 10" STANDARD COLOR TOUCHSCREEN HMI	HMI7081
36	1	1783-BMS20CGL	AB	20 PORT 5700 LITE MANAGED ETHERNET SWITCH	ES8001
37	3	576-S10-007	QUIKTRON	7' SHIELDED CAT5E ETHERNET CABLE	ENET-8021-8031
38	4	576-S10-010	QUIKTRON	10' SHIELDED CAT5E ETHERNET CABLE	ENET-8032,8041
39	1	576-S10-002	QUIKTRON	2' SHIELDED CAT5E ETHERNET CABLE	ENET-8042
40	1	576-S10-003	QUIKTRON	3' SHIELDED CAT5E ETHERNET CABLE	ENET-8051
41	2	576-S10-005	QUIKTRON	5' SHIELDED CAT5E ETHERNET CABLE	ENET-8052,8061
42	1	FLEXY20500_MA	EWON	FLEXY 205 INDUSTRIAL INTERNET ROUTER	VPN8181
43	1	440R-N23126	AB	24VDC MSR127T SAFETY RELAY	SR10061
44	1	700-CF400EJ	AB	24VDC IEC CONTROL RELAY W/ 4 N.O. CONTACTS	MCR10071
45	1	100-FA40	AB	4 N.O. AUX FRONT MOUNT CONTACT BLOCK	MCR10071
46	1	800FP-MT44PX02	AB	22mm RED EMERGENCY STOP PB W/ 2 N.C. CONTACTS	PB10112
47	1	CT-22ESTOP	CT	22mm LEGEND - EMERGENCY STOP	PB10112
48	1	800FP-LF7PN3WX10	AB	22mm 12-30VAC/DC WHITE ILLUM. FLUSH HEAD PB W/ 1 N.O. CONTACT	PBLT10131
49	1	CT-22CONTROL/POWER	CT	22mm LEGEND - CONTROL/POWER	PBLT10131
50	1	1489-M1C030	AB	1 POLE 3A UL489 CIRCUIT BREAKER, C-CURVE	CB13001
51	1	1769-L24ER-QB1B	AB	COMPACTLOGIX 5370 L2 CONTROLLER	PLC13001
52	1	854J-BQ10C	AB	STACK LIGHT BASE W/ 100mm TUBE	LT15191-15211
53	1	854J-24TL3	AB	24VAC/VDC GREEN LED STACK LIGHT	LT15191
54	1	854J-24TL8	AB	24VAC/VDC YELLOW LED STACK LIGHT	LT15201
55	1	854J-24TL4	AB	24VAC/VDC RED LED STACK LIGHT	LT15211
56	1	1492-LD4DR	AB	DOUBLE STACK DIODE TERMINAL	D15011
57	1	1492-EBLD4	AB	END PLATE FOR DOUBLE STACK DIODE TERMINAL	D15011

ITEM	QTY	PART #	MANUFACTURE	DESCRIPTION	DESCRIPTOR
58	3	HI-4050-DR-DC-EIP	HARDY	WEIGHT CONTROLLER	WC21001-23001
59	6	3211757	PHOENIX	6.2mm 30A PUSH IN TERMINAL	.
60	2	3030420	PHOENIX	END COVER FOR 6.2mm PUSH IN TERMINAL	.
61	110	1492-P3Q	AB	5.1mm 4-WIRE PUSH IN TERMINAL	.
62	12	1492-PG3Q	AB	5.1mm 4-WIRE PUSH IN GROUND TERMINAL	.
63	5	1492-EBP3Q	AB	END PLATE FOR 5.1mm 4 WIRE PUSH IN TERMINAL	.
64	6	0800886	PHOENIX	SCREW ON END STOP	.
65	7'	F2X4LG6	PANDUIT	2"x4" LIGHT GRAY WIREWAY	.
66	7'	C2LG6	PANDUIT	2" LIGHT GRAY WIREWAY COVER	.
67	12.5'	F1X4LG6	PANDUIT	1"x4" LIGHT GRAY WIREWAY	.
68	12.5'	C1LG6	PANDUIT	1" LIGHT GRAY WIREWAY COVER	.
69	13'	111023	E-RAIL	35mm DIN RAIL	.
70	1	GBK10	EATON	10 POINT GROUND BAR	GB1
71					
72					
73	1	A8066CHFL	HOFFMAN	8"x6"x6" NEMA 4/12 ENCLOSURE	DUST COLLECTOR OP STATION
74	1	A8P6G	HOFFMAN	GALVANIZED SUB PANEL	.
75	1	800FP-F3PX10	AB	22mm GREEN FLUSH HEAD PB W/ 1 N.O. CONTACT	PB14021
76	1	CT-22START	CT	22mm LEGEND - START	PB14021
77	1	800FP-E4PX01	AB	22mm RED EXTENDED HEAD PB W/ 1 N.C. CONTACT	PB14211
78	1	CT-22STOP	CT	22mm LEGEND - STOP	PB14211
79	1	800FP-P3PN3G	AB	22mm 24VDC GREEN LED PILOT LIGHT	LT15221
80	1	CT-22ON	CT	22mm LEGEND - ON	LT15221
81	1	1492-LD4DR	AB	DOUBLE STACK DIODE TERMINAL	D15051
82	1	1492-EBLD4	AB	END PLATE FOR DOUBLE STACK DIODE TERMINAL	D15051
83	12	1492-P3Q	AB	5.1mm PUSH IN 20A 2 CONNECTIONS PER SIDE	.
84	2	1492-EBP3Q	AB	END PLATE FOR 5.1mm PUSH IN TERMINAL	.
85	2	0800886	PHOENIX	SCREW ON END STOP	.
86	1'	111023	E-RAIL	35mm DIN RAIL	.
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HAPMAN
ideas that move
5944 E. N AVE., KALAMAZOO, MICHIGAN 49048
PHONE (269) 343-1675 FAX (269) 349-2477

DATE	4/10/23	JOB NO.	H20319-DA, HA & LA	DRAWN	MRL
SCALE	N/A			BOM = 1	DWG = 1

TITLE

BILL OF MATERIALS

NEMA 4/12 - COMPACTLOGIX BATCH CONTROL SERIES

CUST. HENKEL

SHEET	OF	DWG. NO.	REV.
27	27	H20319DA-B00	0.3

AGENCY: 10 LABOR & REGULATION
BUDGET UNIT: 1036 ELECTRICAL COMMISSION - INFO

COMPANY	CENTER	ACCOUNT	BALANCE	DR/CR	CENTER DESCRIPTION
6503	103600080801	1140000	722,179.98	DR	ELECTRICAL COMMISSION
6503	103600080802	1140000	189,980.57	DR	ELECT COMM-BONDING ACCT
COMPANY/SOURCE TOTAL 6503 808			912,160.55	DR *	
COMP/BUDG UNIT TOTAL 6503 1036			912,160.55	DR **	
BUDGET UNIT TOTAL 1036			912,160.55	DR ***	