Appendix C

Motor Control Centers

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SUMMARY OF WORK

1. GENERAL

1.1 Description

.1 The work in this Supply Contract comprises of the supply of 480 V and 600 V motor control centers (MCCs) complete with all electrical and control appurtenances. Work also includes start-up, commissioning, training, performance testing and O&M manuals.

.2 The Work includes, but is not limited to the following elements:

.1 Supply and delivery of one (1) 480 V MCC with two main feeds and two (2) ties configuration, and one (1) 600 V MCC with two (2) main feeds and one (1) tie configuration.

.2 Installation assistance, start-up, training, commissioning, performance testing and operations and maintenance (O&M) manuals and complete with Shop Drawings; and

.3 Spare parts and special tools required for maintenance.

.3 Equipment to be installed under a separate contract, with installation guidance from the MCCs Supplier.

.4 Coordinate delivery, storage requirements, installation, training, start-up and commissioning with the Construction Contractor.

.5 All products or materials that are deemed no longer supported or the product is no longer produced at the expiration of the warranty period, shall not be acceptable and will be replaced with the subsequent product. The City shall be notified of these products prior to delivery.

1.2 Work Sequence

.1 Coordinate progress Schedule with the City and Contract Administrator during construction to minimize disruption and maintain disinfection.

.2 Proposed stages include:

.1 Award of Contract.

.2 Review and approval of Shop Drawings.

.3 Review and approval of O&M manual and training content.

.4 Delivery to Site.

.5 Installation assistance.

.6 Start-up, commissioning, and training.

1.3 Work Coordination

.1 Coordinate work with the General Contractor in regard to equipment delivery, storage, installation, start-up, commissioning and training.

1.4 City of Winnipeg Personnel Occupancy

.1 The City personnel will work around Site during the entire construction period for the execution of normal operations.

.2 Co-operate with the City personnel in scheduling operations to minimize conflict and maintain UV disinfection in the system at all times.

.3 Assist the City with operational strategies for when the City is operating the new UV system alongside the existing UV system to preserve disinfection capability.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

1. GENERAL

1.1 Description

.1 Submit to the Contract Administrator the submittals required by individual Specification Sections for review. Submit promptly and in an orderly sequence according to the Schedule of Submittals to not cause a delay in Work. Failure to submit in the scheduled time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Provide a copy of all the Specification Sections in the Tender package with any applicable addenda with each paragraph check-marked to indicate Specification compliance or cross-marked to indicate non-compliance. Requested deviations and clarifications from the specified requirements shall be provided with the Shop Drawings.

.3 Do not proceed with Work affected by the submittal until reviewed by the Contract Administrator.

.4 Present Shop Drawings, product data, and samples in SI Metric units. Dual units are acceptable.

.1 Where items or information is not produced in SI Metric units, convert units to SI Metric.

.5 Review submittals prior to submission to the Contract Administrator. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with the requirements of Work and Contract Documents.

.6 The review by the Contract Administrator is for the sole purpose of ascertaining conformance with the general concept. It does not provide 'approval' of the detailed design inherent in Shop Drawings (which remains with the Supplier), nor does it relieve the Supplier of responsibility for errors or omissions in Shop Drawings or for meeting all requirements of the construction and Contract Documents.

.7 Verify that field measurements and affected adjacent Work are coordinated.

.8 The Supplier shall make any corrections required by the Contract Administrator and shall resubmit the required number of corrected copies of submittals. The Supplier shall direct specific attention in writing on resubmitted submittals to revisions other than the corrections requested by the Contract Administrator on the previous submission.

.9 After the Contract Administrator’s review and return of copies, distribute copies to sub-trades as appropriate.

1.2 Submittals Procedures

.1 Details regarding submittals can be found in the individual Specification Sections.

.2 Direct submittals to the Contract Administrator.

.3 Hardcopy Submittals: Submit hard copies only where specifically required under individual Specifications Sections.

.4 Electronic Submittals: Submittals made in electronic format shall be as follows:

.1 Each submittal shall be an electronic file in a searchable Adobe Acrobat Portable Document Format (PDF), and native files (e.g., Word, Excel, AutoCAD, etc.). Use the 2010 version or newer.

.2 Electronic files that contain more than ten (10) pages in PDF format shall contain internal book marking from index page to major sections of the document.

.3 PDF files shall be set to open “Bookmarks and Page” view.

.4 Add general information to each PDF file, including title, subject, author, and keywords.

.5 PDF files shall be set up to print legibly at 215.9 mm by 279.4 mm, 279.4 mm by 431.8 mm or ISO A1 (594 mm by 841 mm). No other paper sizes will be accepted.

.6 Submit new electronic files for each resubmittal.

.7 Include copy of transmittal of Contractor’s submittal.

.8 Contract Administrator will reject submittals that are not accompanied by an electronic copy.

.9 Provide authorization for Contract Administrator to reproduce and distribute each file as many times as necessary for Project documentation.

.5 Transmittal of Submittal:

.1 Stamp each submittal with a uniform approval stamp before submitting to the Contract Administrator.

.1 Stamp to include project name, submittal number, Specification number, Contractor’s reviewer name, date of Contractor’s approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with Contract.

.2 Contract Administrator will not review submittals that do not bear Supplier’s approval stamp and will return them without action.

.3 Contract Administrator will not review submittals received directly from a Subcontractor and will return them without action.

.4 Complete, sign, and transmit with each submittal package, one (1) transmittal of Contractor’s submittal form.

.2 Identify each submittal with the following:

.1 Numbering and tracking system:

.1 Sequentially number each submittal.

.2 Resubmission of submittal shall have original number with sequential alphabetic suffix.

.2 Specification Section and paragraph to which submittal applies.

.3 Project title and City Purchase Order number.

.4 Date of transmittal.

.5 Name of Contractor.

.3 Include Contractor's written response to each of Contract Administrator's review comments with resubmission of submittals stamped "Exceptions Noted, Resubmit".

.6 Format:

.1 Do not base Shop Drawings on reproductions of Contract Documents.

.2 Package submittal information by individual Specification Section. Do not combine different Specification Sections together in submittal package, unless otherwise directed in Specification.

.3 Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials, and devices, and compliance with Contract.

.4 Index with labeled tab dividers in orderly manner.

.7 Timeliness:

.1 Schedule and submit submittals in accordance with schedule of submittals and requirements of individual Specification Sections.

.2 Submit Shop Drawings and samples a minimum of two (2) months ahead of the scheduled delivery date for associated equipment and material and in an orderly sequence so as to cause no delay in the Work.

.8 Processing Time:

.1 Time for review shall commence on Contract Administrator's receipt of submittal.

.2 Contract Administrator will act upon Supplier's submittal and transmit response to Contractor no later than ten (10) Business Days after receipt, unless otherwise specified.

.3 Supplier shall make all submittal corrections and resubmit to the Contract Administrator within ten (10) Business Days after receipt of mark-ups.

.4 Resubmittals will be subject to the same review time.

.5 The review time required will not alleviate the Supplier of his responsibility to deliver the completed Work within the required time frame and schedule. Planning for submittal reviews and the risk to the delivery schedule remains the Supplier's sole responsibility.

.9 Resubmittals:

.1 Clearly identify each correction or change made and include revision date.

.2 No adjustment of the schedule outlined in the Supplemental Conditions or Contract Price will be allowed due to delays in progress of Work caused by rejection and subsequent resubmittals.

.10 Incomplete Submittals:

.1 The Contract Administrator will return the entire submittal for the Supplier's revision if preliminary review deems it incomplete.

.2 Incomplete Shop Drawing information will be considered as stipulated deductions for the purposes of progress payment certificates.

.3 When any of the following are missing, the submittal will be deemed incomplete:

.1 Contractor's review stamp completed and signed.

.2 Transmittal of Contractor's submittal form completed and signed.

.3 Insufficient number of copies.

.4 All requested information is not provided.

.5 Submittals missing Professional Engineer's seal and signature, where it is required.

.4 The submittal will be deemed incomplete if unusual high number of errors are identified on the submittal, making it difficult to proceed with the review.

.11 Submittals not required by Contract:

.1 Will not be reviewed and will be returned stamped "RECEIVED FOR INFORMATION".

.2 Contract Administrator will keep one (1) copy of all Shop Drawings and Product Data.

1.3 Shop Drawings and Product Data

.1 The term "Shop Drawing" as defined in the City's General Conditions for Construction (Revision 2020-01-31) means all drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor, Subcontractor, Manufacturer, Supplier, or distributor and which illustrate some portion of the Work.

.2 All equipment to be installed at the Site shall require Shop Drawings, which shall be submitted to the Contract Administrator.

.3 Sales bulletins and other general publications are not acceptable as submittals for review except where necessary to provide supplemental technical data.

.4 Adjustments made on Shop Drawings by the Contract Administrator shall not change the Contract Price.

.5 All Shop Drawings shall include details as follows:

.1 General arrangement drawings, outline dimensions and weights.

.2 Anchoring method and dimensioned foundation template.

.3 Dimensioned cable entry locations.

.4 Dimensioned cable termination and pothead height.

.5 Electrical and instrumentation diagrams.

.6 Complete bill of materials listing the scope of supply.

.7 Identified internal and external component layout on assembly drawing.

.8 Insulating liquid type and materials.

.9 Insulating liquid capacity.

.10 Provide data on pressure-relief valves, oil sampling valves (drain, tap, sample), pressure/vacuum gauge, pressure/vacuum regulation, level gauge, liquid temperature indicator, and separable connectors.

.11 Nameplate data, including equipment certification.

.6 Provide recommended spare parts and prices.

.7 Provide estimated losses at no load, 50% load and full load in either Watts per hour (preferred), or BTUs per hour.

.1 Placement and installation of all equipment shall be subject to the approval of the City.

.8 Electrical and control system Shop Drawings shall include additional details as follows:

.1 Elevation layouts, bill of materials (BOM), fuse charts, schematics, interconnections, point-to-point wiring diagrams, motor control diagrams, single line diagram, 3-line diagram, and CSA/cUL panel plates in addition to the other wiring and detail requirements of the Contract.

.1 Panel plates shall be included in submissions, to be permanently affixed on the front exterior door of the enclosure. They shall contain all information required under CSA C22.1 and C22.2. At a bare minimum the short circuit current rating (SCCR) of panel plates shall be equal to the MCC or Panelboard from which they are fed.

.2 Wiring diagrams shall mark conductor identification, field terminals, changes, etc.

.3 Detailed listing of all nameplates.

.4 Identification in accordance with the Drawings.

.2 Motor Control Schematics (MCS) – when these are included, they are detailed drawings showing typical interconnections of motor control equipment. The Contractor shall reproduce a MCS for each motor and record all relevant notes and installation-specific information on each sheet. Update the MCS as necessary and fill in all terminal and wiring numbers from relevant Shop Drawings as they become available.

.3 Equipment descriptive data and detailed information for the system hardware and software (i.e., cutsheets or product literature). Failure to provide product literature or cutsheets with drawing submissions is grounds for marking the submission “Revise and Resubmit” without review.

.1 Highlight only relevant information for the products provided. The intent of the literature is a technical review of the products suitability, technical ratings and limitations, and the installation/application. Sales literature, or custom-made sheets, or sales declarations shall not be included. Only manufacturer issued technical literature shall be accepted.

.2 Where products have configurable part numbers, the part number options shall be broken down and either circled in red or highlighted in yellow.

.3 All cutsheets and product literature shall be provided showing CSA or cUL markings either circled in red or highlighted in yellow.

.4 Where hazardous location products are required, they shall be submitted with their CSA or cUL certificates, and CSA or cUL required wiring diagrams for hazardous installations. The control system wiring diagrams shall capture these requirements, provide intrinsically safe barriers and methods as required by NFPA 820, and provide notes for the electrical installer.

.9 Notify the Contract Administrator in writing of any deviations in Shop Drawings from the requirements of the Contract.

.1 Contract Administrator will not assume the responsibility for searching out deviations in the Contractor’s drawings.

.10 The Supplier shall examine all Shop Drawings prior to submission to the Contract Administrator to ensure that all necessary requirements have been determined and verified and that each Shop Drawing has been checked and coordinated with the requirements of the Work and the Contract. Examination of each Shop Drawing shall be indicated by stamp, date, and signature of a responsible person of the Subcontractor for supplied items and of the Supplier for fabricated items. Shop Drawings not stamped, signed, and dated will be returned without being reviewed and stamped " REVISE AND RESUBMIT ". Ensure that the following are verified:

.1 Field measurements.

.2 Field construction criteria.

.3 Catalogue numbers and similar data.

.11 Submittals shall be in one (1) of the following formats:

.1 Submit three (3) copies of white prints and three (3) copies of all fixture cuts and brochures.

.2 Submit one (1) electronic searchable PDF copy.

.12 Shop Drawings will be returned to the Supplier with one (1) of the following notations:

.1 When stamped "REVIEWED" or "NO EXCEPTIONS TAKEN", distribute additional copies as required for execution of the Work.

.2 When stamped "REVIEWED AS MODIFIED" or "MAKE NOTED CORRECTIONS", ensure that all copies for use are modified and distributed, same as specified for "REVIEWED".

.3 When stamped "REVISE AND RESUBMIT", make the necessary revisions, as indicated, consistent with the Contract and submit again for review.

.4 When stamped "NOT REVIEWED" or "REJECTED", submit other Shop Drawings, brochures, etc., for review consistent with the Contract.

.5 Only Shop Drawings bearing "REVIEWED", "NO EXCEPTIONS TAKEN", "MAKE NOTED CORRECTIONS", or "REVIEWED AS MODIFIED" shall be used on the Work unless otherwise authorized by the Contract Administrator.

.13 After submittals are stamped "REVIEWED", "NO EXCEPTIONS TAKEN", "MAKE NOTED CORRECTIONS" or "REVIEWED AS MODIFIED", no further revisions are permitted unless re-submitted to the Contract Administrator for further review.

.14 Make changes in Shop Drawings, which the Contract Administrator shall require, consistent with Contract. When re-submitting, notify the Contract Administrator in writing of any revisions other than those requested by the Contract Administrator.

.15 The mark-up and comments on submittals and O&M package shall be incorporated within two (2) months of receipt from the Contract Administrator regardless of the status of the returned submittal. Supplier shall submit long-term storage requirements for equipment that is received by the Construction Contractor and stored prior to installation.

.16 Supplier shall provide a list of maintenance requirements for uninstalled equipment to be performed and documented by the Construction Contractor. The list shall be submitted one (1) month prior to the delivery of the equipment.

.17 Construction Contractor shall submit records of the maintenance schedules to the Contract Administrator on a monthly basis.

1.4 Description of Construction Methods

.1 The Supplier shall, if required by the Contract Administrator, submit for the review of the Contract Administrator method statements which describe in detail, supplemented with Drawings where necessary, the methods to be adopted for executing any portion of Work.

.2 These statements shall also include details of constructional plan and labour to be employed. Acceptance by the Contract Administrator shall not relieve the Supplier of any of his responsibilities, nor shall reasonable refusal to approve entitles the Supplier to extra payment or an extension of time.

.3 Other Considerations:

.1 Fabrication, erection, installation, and commissioning may require modifications to equipment and systems to conform to the design intent. Revise pertinent Shop Drawings and resubmit.

1.5 Requests for Information

.1 In the event that the Contractor or any Subcontractor involved in the Work, determines that some portion of the Drawings, Specifications, or other Contract Documents requires clarification or interpretation by the Contract Administrator, the Supplier shall submit a Request for Information (RFI) Form in writing to the Contract Administrator.

.2 Submission Procedure:

.1 Submit RFI's to the Contract Administrator on the "Request for Information" form appended to this Specification Section. The Contract Administrator shall not respond to a RFI except as submitted on this form.

.2 Number RFI's consecutively in one sequence in order submitted, in a numbering system established by the Contract Administrator.

.3 Submit one (1) distinct subject per RFI request. The unrelated items shall not be combined on one (1) form.

.4 Where RFI form does not have sufficient space, attach additional sheets as required.

.5 Submit with RFI form all necessary supporting documentation.

.3 In the RFI, the Supplier shall clearly and concisely provide:

.1 The issue for which clarification or interpretation is sought and why a response is needed from the Contract Administrator; and

.2 An interpretation or understanding of the requirement along with reasons why such an understanding was reached.

.4 The Contract Administrator will review all RFIs to determine whether they are valid RFIs. If it is determined that the document is not a valid RFI, it will be returned to the Contractor not having been reviewed with an explanation why it was deemed not valid.

.5 An RFI response shall be issued within ten (10) Business Days of receipt of the request from the Supplier unless the Contract Administrator determines that a longer time is necessary to provide an adequate response. When the RFI submission is received by the Contract Administrator before noon, the review period commences on that Business Day. When the RFI submission is received by the Contract Administrator after noon, the review period commences on the subsequent Business Day.

.6 If, at any time, the Contractor submits a large number of RFI's or the Contract Administrator considers the RFI to be of such complexity that the Contract Administrator cannot process the RFI's within ten (10) Business Days, the Contract Administrator shall confer with the Contractor within five (5) Business Days of receipt of such RFI's and the Contract Administrator and the Supplier will jointly prepare an estimate of the time necessary for processing the RFI as well as an order of priority among the RFI's submitted. The Contractor shall accommodate such necessary time at no impact to the schedule and at no additional cost to the Contract.

.7 If the Supplier submits a RFI on an activity with ten (10) Business Days or less of available time to the impacted activity on the current project schedule, the Contractor shall not be

entitled to any time extension due to the time it takes the Contractor Administrator to respond to the request provided that the Contract Administrator responds within the ten (10) Business Days set forth above.

.8 An RFI response from the Contract Administrator will not change any requirement of the Contract. In the event the Supplier believes that the RFI response from the Contract Administrator will cause a change to the requirements of the Contract, the Supplier shall within ten (10) Business Days give written notice to the Contract Administrator stating that the Contractor believes the RFI response will result in a change to the Contract and the Supplier intends to submit a change request. Failure to give such written notice of ten (10) Business Days shall waive the Supplier's right to seek additional time or cost under the requirements of the Contract.

1.6 Closeout Submittals

.1 Refer to Section 01 78 00 - Closeout Submittals.

1.7 Miscellaneous Submittals

.1 Prepare and submit required Contract Documents.

.2 Copies: Submit one (1) electronic copy to Contract Administrator. Method of electronic submission shall be coordinated with Contract Administrator after execution of the Contract.

.1 Submit hard copies for paint samples and other submittals where specifically required under individual Specifications Sections.

.3 The Contract Administrator will review submittals for general conformance with design concept and intent, and general compliance with Contract.

.4 The Contract Administrator's review does not relieve Supplier from compliance with requirements of Contract nor from errors in submittals or Supplier's design.

.5 The Construction Contractor shall be responsible for confirmation of dimensions at Site; fabrication processes; means, methods, techniques, sequences, and procedures of construction; coordination of work of all trades; and performance of Work in safe and satisfactory manner and in accordance with Specification Sections 01 65 00 and 01 91 31.

.6 At the Contract Administrator's option, the Contract Administrator's review comments and review stamp will be placed either directly on submitted copies of submittals or on separate submittal review comment form.

.7 Where work is to be designed by the Supplier, comply with applicable codes and furnish submittals signed and sealed by a Professional Engineer licensed in the Province of Manitoba, as required by Specifications. If requested, calculations shall be submitted for review. Calculations shall be signed and sealed by a Professional Engineer registered in the Province of Manitoba.

1.8 Supplements

.1 The supplements listed below, following "End of Section", are part of this Specification:

.1 Request for Information (RFI), RFI No.0.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

SUBMITTALS

For details and instructions on how to complete this document, click the [¶] icon under the Home tab to display the hidden text.

RFI Title: _____ **RFI No.:** 0

Date RFI initiated: _____ **Date Response Requested by:** _____

Date Response Issued: _____

Project Name: _____

Submitted To:			
Contract Administrator (CA):		Consultant Ref. No.	
Company/Dept.:		Tender No.	

Requested By:		***For CA Use***	
Name:		City File No.:	
Title:		Project ID:	
Company:		Project Record Index No.:	
Email::		Purchase Order No.:	

Request/Question: (to be completed by Contractor)

Answer/Response: (to be completed by Contract Administrator)

Attachment(s):

Distribution (to be completed by Contract Administrator)

- Contract Administrator
- Contractor
- City Project Manager
- Other:

Click here to enter text.

COMMON PRODUCT REQUIREMENTS

1. GENERAL

1.1 Standards

.1 Within text of each Specification Section, references are made to reference standards.

.2 Conform to these reference standards, in whole or in part as specifically requested in the Specifications.

.3 If there is question as to whether products or systems are in conformance with applicable standards, the Contract Administrator reserves the right to have such products or systems tested to prove or disprove conformance.

.4 Cost for such testing shall be borne by the City in event of conformance with Construction Contract Documents or by the Construction Contractor in event of non-conformance.

.5 Conform to latest date of issue of referenced standards in effect on date of submission of Bids.

1.2 Quality Assurance

.1 Products, materials, equipment and articles incorporated in the Work shall be new, not damaged or defective, and of the best quality for the purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Defective products, whenever identified prior to completion of Work, shall be rejected, regardless of previous inspections. Inspection shall not relieve responsibility but is a precaution against oversight or error. Supplier shall remove and replace defective products at his own expense and shall be responsible for delays and expenses caused by rejection.

.3 Should disputes arise as to the quality or fitness of products, decision rests strictly with the Contract Administrator based upon the requirements of the Construction Contract Documents.

.4 Unless otherwise indicated in the Specifications, maintain uniformity of manufacture for any particular or like item.

.5 Permanent labels, trademarks and nameplates on products shall not be acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

.6 The Construction Contractor shall be responsible for development of a quality plan to ensure all tasks are performed to the necessary requirements and Supplier specifications. The supplier shall provide requirements to the Construction Contractor.

1.3 Availability

.1 Immediately upon the City exercising its option to purchase, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, immediately notify Contract Administrator of such, in order that

substitutions or other remedial action shall be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Contract Administrator at commencement of Work and should it subsequently appear to the Contract Administrator that Work may be delayed for such reason, Contract Administrator reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 Storage, Handling and Protection

.1 The Supplier shall provide the Construction Contractor with full instructions in writing of all preservation requirements, procedures and precautions for long-term storage and protection of the equipment. A copy of all instructions shall be provided to the Contract Administrator.

.2 The Construction Contractor shall be responsible for storage of the equipment, appurtenances, and materials and for protection against weather, loss, damage, or theft until equipment installation.

.3 The storage location shall be inspected and approved by the Contract Administrator and/or the City.

.4 The Construction Contractor shall:

.1 Handle and store products in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with Supplier's instructions.

.2 Store packaged or bundled products in original and undamaged condition with Manufacturer's seal and labels intact. Items shall not be removed from packaging or bundling until provided to the Construction Contractor.

.3 Store products subject to damage from weather in above zero weatherproof enclosures.

.4 Store materials on flat, solid supports and keep clear of ground. Slope to shed moisture.

.5 Remove and replace damaged products at own expense and to the satisfaction of the Contract Administrator.

.6 Touch-up damaged factory finished surfaces to Contract Administrator’s satisfaction. Use touch-up materials to match original. Do not paint over nameplates.

.5 The Construction Contractor shall adhere to Supplier’s long-term storage and maintenance instructions.

.6 Preservation requirements and procedures as per Supplier’s recommendation shall be followed and documented by the Construction Contractor. Construction Contractor shall keep records of the maintenance schedules (lubrication, coatings, etc.) frequently and submit the records to the Contract Administrator on a monthly basis.

1.5 Transportation

.1 Pay costs of transportation of products required in performance of Work. Goods shall be delivered freight on board, all duties and taxes paid, to Winnipeg, MB.

.2 The Construction Contractor shall be responsible for receiving, off-loading, and placing into storage all equipment at the Site.

1.6 Supplier's Instructions

.1 Unless otherwise indicated in the Specifications, the Construction Contractor shall install or erect products in accordance with the Supplier's instructions.

1.7 Quality of Work

.1 Ensure Quality of Work is of the highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify the Contract Administrator if required Work is such as to make it impractical to produce required results.

.2 The Supplier and Contractor shall not employ anyone unskilled in their required duties for Work. The Contract Administrator reserves the right to require dismissal from Site for workers deemed incompetent or careless.

.3 Decisions as to the standard or fitness of Quality of Work in cases of dispute rest solely with the Contract Administrator, whose decision is final.

1.8 Location of Fixtures

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform the Contract Administrator of conflicting installation. Install as directed.

1.9 Fastenings

.1 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wooden, or any other organic material, plugs are not acceptable.

.2 Keep exposed fastenings to a minimum, space evenly and install neatly.

.3 Fastenings which cause spalling or cracking of material to which anchorage is made shall not acceptable.

.4 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.5 Use heavy hexagon heads, semi-finished unless otherwise specified. Use 304 stainless steel unless specified otherwise.

.6 Bolts may not project more than one diameter beyond nuts.

.7 Prevent electrolytic action between dissimilar metals and materials.

.8 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

EQUIPMENT INSTALLATION

1. GENERAL

1.1 Description

.1 This Section describes requirements for all equipment supplied under this Contract relating to factory inspections, equipment delivery, equipment installation training, equipment installation, commissioning, equipment performance testing, and process performance tests.

.2 At least thirty (30) days prior to commencing equipment operation and the Running Test, the Supplier shall assist the Construction Contractor to prepare and submit a detailed start-up plan to indicate the schedule and sequence of equipment installation checks and tests required for the Contract Administrator's review and inputs. No testing Work shall commence until this plan has been discussed and reviewed by all parties involved and accepted by the Contract Administrator.

1.2 Definitions

.1 Supplier's Representative: A Supplier's Representative is a trained person empowered by the Supplier to provide:

.1 Witnessing of delivery.

.2 Installation instruction.

.3 Assistance in pre-start up checks and testing.

.4 Training to the City's staff.

1.3 Expertise and Responsibility

.1 The Contract Administrator recognizes the expertise of the Supplier.

.2 Should the Contract Administrator issue an Addendum, Field Order, Change Order, or Instruction to change the Work which would, in the opinion of the Supplier, compromise the success or safety of the Work, then it shall be incumbent on the Supplier to notify in writing the Contract Administrator to this effect within two (2) days.

1.4 Inspection at Factory

.1 Refer to Specification Section 26 24 19 for requirements on Factory Acceptance Testing.

.2 The City or the Contract Administrator may, before or after selection of equipment has been made, inspect or have an authorized representative inspect the manufacturing, assembling, and testing facilities at the Supplier's or Subcontractor equipment factory, to satisfy themselves of the capability of the Supplier or Subcontractor equipment to supply the specified equipment.

.3 The City and/or the Contract Administrator may inspect or have an authorized inspector inspect the equipment factory or the process of manufacture or testing of the equipment at the Supplier's or Subcontractor equipment factory at any reasonable time. The City and/or the Contract Administrator or the inspector may notify the Supplier or Subcontractor at any time of unsatisfactory materials, workmanship, or processes.

.4 The Supplier shall provide every reasonable facility, access, and cooperation to assist the City and the Contract Administrator or an authorized inspector in carrying out inspection or testing at the equipment factory or facility.

.5 Inspection or testing carried out by the City or the Contract Administrator or an authorized inspector shall not relieve the Supplier of the responsibility for supplying equipment in accordance with the Contract and good engineering practice.

1.5 Equipment Delivery

.1 Delivery shall be coordinated with and made to the Construction Contractor. Written acceptance of receipt, at delivery, by the Construction Contractor shall constitute “Delivery to Site” under this Contract. The shipping lists of materials shall be carefully checked by the Supplier’s Representative in the presence of the Contract Administrator and the Construction Contractor. When the Construction Contractor accepts the equipment delivery, they shall certify the delivery by completing Form 100 – Certificate of Equipment Delivery, attached to this Specification.

.2 The Supplier shall provide a schedule within fifteen (15) calendar days after notification of acceptance of Shop Drawings. No delivery to the Site of the Work shall occur until Reviewed Shop Drawings are received by the Supplier.

.3 The schedule shall allow for:

.1 Two (2) weeks for the Contract Administrator to review and comment on the Supplier’s Shop Drawings for the equipment to be supplied. Additional time for Shop Drawings corrections and resubmittals shall be accommodated in the schedule.

.4 The Supplier shall be entitled to an extension of the quoted delivery period on account of:

.1 Delay attributable to Acts of God or other matters, which were not the fault of the Supplier and over which it had no control, provided that the Supplier took all possible action to reduce delays and notified the City promptly of the occurrence of such delays.

.5 Ten (10) days before delivery, notice shall be given to the Contract Administrator so that arrangements for receipt and for inspection can be made. The shipping lists of materials shall be carefully checked by the Supplier in the presence of the Contract Administrator and the Construction Contractor.

.6 The Supplier shall clearly mark each item to be shipped and identify and reference it to the packing lists and to bills of materials on the Shop Drawings. The lists will be used by the Supplier, the Construction Contractor, and the Contract Administrator to check the contents of each delivery. No shipments shall be off-loaded until itemized packing lists have been received by the parties mentioned herein.

.7 The Supplier shall adequately pack and crate each component to provide protection during transport, handling, and storage. Equipment suitable for outside storage will be stored to the satisfaction of the Supplier and the Contract Administrator. The Supplier shall identify each component with durable labels or tags securely attached to each piece of equipment, crate, or container. All crates shall be clearly labelled with five (5) (five) cm red font as “Indoor Storage” or “Outdoor Storage” on a minimum of four (4) faces of the crate.

.8 The Supplier shall protect polished and machined metal surfaces from corrosion and damage during shipment and storage and shall carefully pack and crate the equipment for

shipment. The Supplier shall protect threaded connections with threaded plugs or caps and shall protect open plain end pipes with caps.

.9 The Supplier shall pack electrical equipment and control panels to prevent scratching, access by dirt, moisture, or dust, or damage to insulation and shall cover equipment having exposed bearings and glands to exclude foreign matter. All openings in the equipment shall be covered before shipment. Sufficient lifting hooks shall be supplied for handling all crates and boxes and heavy pieces.

.10 The Construction Contractor shall provide temperature controlled, humidity controlled and secure local storage in Winnipeg, MB in a location to be inspected and approved by the City, between equipment delivery and installations according to Specification Section 01 61 00.

.11 The Construction Contractor may elect to store the equipment for an extended duration (i.e. six (6) months or more), to accommodate the construction schedule. The Supplier shall provide any special packaging and protective coatings, lubricants, etc., which the Supplier deems necessary to protect the equipment during the protracted storage and prior to equipment performance testing. Coordinate with the Construction Contractor.

.12 The Supplier shall be responsible for providing the Construction Contractor with full instructions in writing of all precautions to be observed in connection with the storing and protection of the equipment.

.13 The Construction Contractor shall keep records of the maintenance schedules and submit to the Contract Administrator on a monthly basis.

.14 The Construction Contractor shall notify the Contract Administrator of any damages and loss occurred to the stored equipment during the storage period. Any damaged crate shall be fully inspected by the City and the Supplier. The Construction Contractor shall be responsible for the repair and replacement of the damaged and lost good.

.15 The Construction Contractor shall be responsible for removing any protective coatings prior to installation and equipment performance testing in accordance with the Supplier’s written instructions.

.16 The Supplier’s Representative shall be at the delivery Site to witness the off-loading, moving and placement of the equipment and to examine the equipment for damage and loss, and to inspect the Construction Contractor’s storage facilities for the equipment supplied for compliance with the Supplier’s recommendations. The Supplier shall maintain an inventory of all equipment supplied and delivered to the Construction Contractor.

.17 The Construction Contractor shall be responsible for receiving, off-loading, and placing into storage all equipment at the Site and/or the off-Site storage location.

1.6 Installation Assistance

.1 The equipment will be installed by the Construction Contractor in the UV building electrical room. The Supplier’s Representative shall assist in the installation.

.2 Unless otherwise specifically stated in the Specifications, the Supplier shall provide, a factory-trained Representative who, in conjunction with the Contract Administrator or their agent, shall give instructions regarding the installation of the equipment.

.3 Before commencing installation of the equipment, the Construction Contractor shall arrange for the attendance of the Supplier's Representative who shall provide instructions in the methods, techniques, precautions, and any other information relevant to the successful installation of the equipment.

.4 The Construction Contractor shall inform the Contract Administrator, in writing, of the attendance at the Site of any Supplier's Representative for installation training at least fourteen (14) days prior to arrival.

.5 Before commencing the second installation period, the Supplier's Representative shall be at the storage site to inspect the stored equipment for damage and loss. The Supplier's Representative shall identify any outstanding deficiencies and shall provide a copy of the inspection report to the Contract Administrator. The deficiencies shall be rectified by the Construction Contractor and the Supplier's Representative shall re-inspect the equipment.

.6 When the Supplier's Representative is satisfied that the Construction Contractor is aware of all installation requirements, they shall so certify by completing Form 101 – Certificate of Readiness to Install, attached to this Specification.

.7 The completed form shall be delivered to the Contract Administrator prior to departure of the Supplier's Representative from the Site.

.8 Installation of the equipment shall not commence until the Contract Administrator has advised that he has received the completed Form 101.

.9 Separate copies of Form 101 shall be used for each MCC and for each installation period.

1.7 Installation

.1 If necessary, or if so directed by the Contract Administrator during the course of installation, the Construction Contractor shall contact the Supplier's Representative to receive clarification of installation procedures, direction and any other additional information necessary to continue and complete the installation in an appropriate manner.

.2 The Construction Contractor shall arrange for the Supplier's Representative to visit the Site to provide assistance and instruction during all of the separate installation periods, and including items such as all aspects of installation, at the Construction Contractor's cost. For clarity, the Supplier's Representative is not required to witness the entirety of the installation.

.3 Prior to completing each period of installation, the Construction Contractor shall inform the Supplier's Representative and arrange for the attendance at the Site of the Supplier's Representative to verify successful installation.

.4 The Supplier's Representative shall conduct a detailed inspection of the installation for each period of installation including alignment, electrical connections, workmanship and all other items as required to ensure successful operation of the equipment.

.5 The Supplier's Representative shall identify any outstanding deficiencies in the installation.

.6 The deficiencies shall be rectified by the Construction Contractor and the Supplier's Representative shall be required to re-inspect the installation, at the Construction Contractor's cost.

.7 When the Supplier's Representative accepts the installation, they shall certify the installation by completing Form 102 – Certificate of Satisfactory Installation, attached to this Specification.

.8 Separate copies of Form 102 shall be used for each MCC installation.

.9 Deliver the completed Form 102 to the Contract Administrator prior to departure of the Supplier's Representative from the Site.

.10 Tag the equipment with a 100 mm by 200 mm card stating "EQUIPMENT CHECKED. DO NOT RUN." stencilled in large black letters. Sign and date each card.

1.8 Operation and Performance Verification

.1 Equipment shall be subjected to a demonstration and Running Test after the installation has been verified and any identified deficiencies have been remedied.

.2 During the demonstration and Running Test, the Construction Contractor shall operate equipment as required by Section 01 91 31 to complete the Performance Verification.

.3 Inform the Contract Administrator at least fifteen (15) Calendar Days in advance of conducting the tests and arrange for the attendance of the Supplier's Representative. The tests may be concurrent with the inspection of satisfactory installation if mutually agreed by the Construction Contractor and the Contract Administrator.

.4 The Supplier's Representative shall conduct all necessary checks to the equipment and if necessary, advise the Construction Contractor of any further checking, flushing, cleaning, or other work needed prior to confirming the equipment is ready to run.

.5 Testing shall be performed according to Section 01 91 31.

1.9 Supplements

.1 The supplements listed below, following "End of Section", are part of this Specification:

.1 Form 100 – Certificate of Equipment Delivery.

.2 Form 101 – Certificate of Readiness to Install.

.3 Form 102 – Certificate of Satisfactory Installation.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

CERTIFICATE OF EQUIPMENT DELIVERY
FORM 100

EQUIPMENT INSTALLATION

We certify that the equipment listed below has been received and delivered into the care of the Construction Contractor. The equipment has been found to be in satisfactory condition. No defects in the equipment were found.

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

_____ _____
(Authorized Signing Representative of the Construction Contractor) Date

_____ _____
(Authorized Signing Representative of the Supplier) Date

_____ _____
(Authorized Signing Representative of the Contract Administrator) Date

CERTIFICATE OF READINESS TO INSTALL
FORM 101

I have familiarized the Construction Contractor of the specific installation requirements related to the equipment listed below and am satisfied that he understands the required procedures.

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

_____ _____
(Authorized Signing Representative of the Supplier) Date

I certify that I have received satisfactory installation instructions from the equipment Supplier.

_____ _____
(Authorized Signing Representative of the Construction Contractor) Date

CERTIFICATE OF SATISFACTORY INSTALLATION
FORM 102

I have completed my check and inspection of the installation listed below and confirm that it is satisfactory and that defects have been remedied to my satisfaction except any as noted below:

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

OUTSTANDING DEFECTS: _____

_____ _____
(Authorized Signing Representative of the Supplier) Date

_____ _____
(Authorized Signing Representative of the Construction Contractor) Date

_____ _____
(Authorized Signing Representative of the Contract Administrator) Date

CLOSEOUT SUBMITTALS

1. GENERAL

1.1 Submittals

.1 Submittals shall be in accordance with Specification Section 01 33 00.

.2 Prepare instructions and data using personnel experienced in the maintenance and operation of described products.

.3 A copy will be returned after final inspection with the Contract Administrator's comments.

.4 Revise the content of the documents as required prior to final submittal.

.5 All mark-ups identified from previous reviews shall be implemented for final O&M manuals.

.6 Four (4) weeks prior to Substantial Performance of the Work, the Construction Contractor will submit, to the Contract Administrator, six (6) final paper copies of the Operating and Maintenance (O&M) Manuals and one (1) searchable electronic copy (PDF) on USB drive in S.I. Units. Supplier shall submit the information contained herein, electronically and in a format such that the Construction Contractor can submit hard copies as specified herein.

.7 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of the same quality and manufacture as the products provided in Work.

.8 Furnish evidence, if requested, for type, source and quality of the products provided.

1.2 Format

.1 Organize data as an instructional manual.

.2 The Construction Contractor will submit the manual as follows. Binders shall be vinyl, hard covered, 3 'D' ring, loose leaf with spine and face pockets. The maximum width of each binder shall not exceed 125 mm; where there is more data than will fit in a binder of 125 mm maximum width, the number of binders shall be as required.

.3 When multiple binders are used, correlate the data into related consistent groupings. Identify contents of each binder on the spine.

.4 Covers shall be used to identify each binder with type or printed title "Operation and Maintenance Manual"; list date, title of project, the City, Construction Contractor and Contract Administrator, and identify subject matter of contents.

.5 Arrange content by systems, under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 The text shall be Manufacturer's printed data.

.8 Drawings shall be provided with reinforced punched binder tab. Bind in with text, fold larger drawings to size of text pages.

.9 Provide 1:1 scaled CAD files in dwg format on a USB drive.

.10 Provide one (1) electronic copy (on USB drive) of the entire manual. The electronic copy shall have a linked Table of Contents to each section and shall be word searchable.

.11 PDF files shall be set to open “Bookmarks and Page” view and contain internal book marking from index page to major sections of document.

1.3 Contents - Each Volume

.1 Table of Contents: provide title of project:

.1 Date of submission; names.

.2 Addresses and telephone numbers of the Contract Administrator, Contractor and Sub-Contractor with the names of responsible parties.

.3 Schedule of products and systems, indexed to content of volume.

.2 For each product and system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Drawings larger than 210 mm x 300 mm (A4) shall be contained in plastic pouch. Provide a separate panel for each drawing.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating Manufacturer's instructions.

.6 Training: refer to Section 01 79 00.

1.4 As-Builts and Samples

.1 Maintain one (1) record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to Contract.

.5 Reviewed Shop Drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.2 Label record documents and file in accordance with Section number listings in the List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.3 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.4 Keep record documents and samples available for inspection by the Contract Administrator.

1.5 Equipment and Systems

.1 For each item of equipment and each system:

.1 Include the description of the unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Provide copy of reviewed submittals.

.3 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.4 Include installed colour coded wiring diagrams.

.5 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and any special operating instructions.

.6 Maintenance Requirements: include preventative and corrective maintenance routine, procedures and guide for troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.7 For any equipment requiring measurement to be taken, the baseline values of all measurements shall be provided.

.8 Safety Data Sheets (SDSs) for all chemicals needed in operation and maintenance.

.9 Provide a maintenance and lubrication schedule, and a list of lubricants and quantities required. Use the summary forms provided at the end of this Section.

.10 Include Manufacturer's printed O&M instructions.

.11 Include the sequence of operation by the controls Manufacturer.

.12 Provide original Manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.13 Provide a list of original Manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Additional requirements: as specified in individual Specification Sections.

1.6 Materials and Finishes

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-Protection and Weather-Exposed Products: include the Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual Specifications Sections.

1.7 Spare Parts

.1 Provide spare parts, in quantities specified in individual Specification Sections.

.2 Provide items of the same manufacture and quality as items in the Work.

.3 Deliver to Site, place and store.

.4 Receive and catalogue items. Submit inventory using the summary form at the end of this Section. Include approved listings in O&M Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.8 Maintenance Materials

.1 Provide maintenance and extra materials, in quantities specified in the individual Specification Sections.

.2 Provide items of the same manufacture and quality as items in the Work.

.3 Deliver to Site, place and store.

.4 Receive and catalogue items. Submit inventory listing to the Contract Administrator. Include approved listings in the O&M Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.9 Special Tools

.1 Provide special tools, in quantities specified in individual Specification Section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver to Site, place and store.

.4 Receive and catalogue items. Submit inventory listing to the Contract Administrator. Include approved listings in the O&M Manual.

1.10 Storage, Handling and Protection

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration and in accordance with the Manufacturer's preservation instruction.

.2 Store in original and undamaged condition with Manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and to satisfaction of Contract Administrator.

1.11 Warranties and Bonds

.1 Develop a warranty management plan to contain information relevant to Warranties. Warranty management plan to include required actions and documents to assure that the Contract Administrator receives warranties to which it is entitled.

.2 Provide the plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.3 Submit warranty management plan to the Construction Contractor, a minimum of sixty (60) days before planned pre-warranty conference.

.4 Submit warranty information made available during the construction phase, to the Contract Administrator for approval prior to each monthly pay estimate.

.5 Assemble approved information for Construction Contractor and submit upon acceptance of work. Organize the information as follows:

.1 Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing.

.2 List Subcontractor, Supplier, and Manufacturer, with name, address, and telephone number of responsible principals.

.3 Obtain warranties and bonds, executed in duplicate by Subcontractors, Suppliers, and Manufacturers, within ten (10) days after completion of the applicable item of Work.

.4 Verify that documents are in proper form, contain full information, and are notarized.

.5 Co-execute submittals when required.

.6 Retain warranties and bonds until time specified for submittal.

.6 Conduct a joint ten (10) month warranty inspection, measured from the time of acceptance by the Contract Administrator. The inspection shall be attended by the Contract Administrator, Contractor, and Supplier's Representative.

.7 Include information contained in the warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of Construction Contractors, Subcontractors, Manufacturers or Suppliers involved.

.2 Provide a list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of Manufacturers or Suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one (1) year overall warranty of construction after Substantial Performance for all the units functioning. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of the warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent O&M Manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.3 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.8 Respond in a timely manner to oral or written notification of required construction warranty repair work.

.9 Written verification will follow oral instructions. Failure to respond will be cause for the City to proceed with action against the Construction Contractor.

1.12 Warranty Tags

.1 Tag, at time of installation, each warranted item. Provide durable, oil and water-resistant tag approved by the Contract Administrator.

.2 Attach tags with a durable plastic tie.

.3 Leave the date of acceptance until project is accepted for occupancy.

.4 Indicate the following information on the tag:

.1 Type of product/material.

.2 Model number.

.3 Serial number.

.4 Construction Contract number.

.5 Warranty period.

.6 Inspector's signature.

.7 Construction Contractor.

1.13 Supplements

.1 The supplements listed below, following “End of Section”, are part of this Specification:

.1 Forms: Maintenance Summary Form.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

MAINTENANCE SUMMARY FORM

PROJECT: _____ CONTRACT NO.: _____

1. EQUIPMENT ITEM _____
2. MANUFACTURER _____
3. MODEL _____
4. SERIAL NUMBER _____
5. EQUIPMENT/TAG NUMBER(S) _____
6. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 45 KG) _____
7. NAMEPLATE DATA (hp, voltage, speed, etc.) _____
8. MANUFACTURER' S LOCAL REPRESENTATIVE _____
   a. Name _____ Telephone No. _____
   b. Address _____
9. MAINTENANCE REQUIREMENTS

MAINTENANCE OPERATION COMMENTS	**FREQUENCY**	**LUBRICANT (IF APPLICABLE)**
List briefly each maintenance operation required and refer to specific information in manufacturer's standard maintenance manual, if applicable. (Reference to manufacturer's catalog or sales literature is not acceptable.)	List required frequency of each maintenance operation	Refer by symbol to lubricant required.

10. LUBRICANT LIST

REFERENCE SYMBOL	**[SHELL]**	**[STANDARD OIL]**	**[GULF]**	**[ARCO]**
List symbols used in No. 9. above.	List equivalent lubricants, as distributed by each manufacturer for the specific use recommended.			

11. RECOMMENDED SPARE PARTS FOR THE CITY'S INVENTORY.

PART NO.	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT COST**
Note: Identify parts provided by this Contract with two asterisks.				

DEMONSTRATION AND TRAINING

1. GENERAL

1.1 Description

.1 This Section contains requirements for training City staff, by persons retained by the Contractor specifically for the purpose of proper operation and maintenance of all equipment supplied and installed under this Contract.

.2 The Contractor will develop the overall training plans for the equipment with input from the Supplier and the City. The Supplier shall be responsible for providing qualified training instructors and field lesson plans as detailed in the Specifications and as described herein.

.3 Arrange for Supplier's Representatives to supply detailed classroom and hands-on training to the City's operations personnel, maintenance personnel, and select on-call personnel on operation and maintenance of specified product (system, subsystem, and component) and as required in applicable Specifications.

.1 Be tailored for the specific audience in each course.

.2 Ensure that each course accommodates plant staff shift schedules by providing multiple sessions covering the same content if necessary.

.3 Arrange for and require plant staff to perform the demonstrated procedures and provide an evaluation of the Participants.

.4 The City shall require training for at least two (2) sessions for Electrical and Instrumentation staff. See Table 1.

Table 1: Training Requirements

Training Participant Groups	Approximate Number of Personnel	Minimum Number of Sessions	Constraints
Maintenance Personnel			
Electrical and Instrumentation Maintenance	14	2	

.5 To facilitate the scheduling of the City personnel, the City may elect to divide sessions into operation-specific topics and maintenance-specific topics as applicable, to allow operations/ on-call staff and maintenance staff to attend separately. The Contractor shall coordinate with the Contract Administrator and the City. Training to be scheduled and coordinated to not interfere with the operation and maintenance of the existing NEWPCC facility.

.6 Training will be scheduled at least four (4) weeks in advance of the respective training sessions.

.7 Furnish trained, articulate personnel to coordinate and expedite training, to be present during training coordination meetings with the City and familiar with Operation and Maintenance manual information specified in Specification Section 01 78 00.

.8 Training sessions shall be conducted by qualified Supplier's Representatives, with a minimum of two (2) years' experience. Supplier's Representatives shall be familiar with the specified equipment as well as with facility operation and maintenance requirements.

.9 The Contract Administrator has the authority to determine if the training is sufficient based on the lesson plan submitted by the Contractor.

.10 Furnish complete training materials, to include operation and maintenance data, to be retained by each trainee.

1.2 Submittals

.1 Submit the following information to the Contract Administrator thirty (30) Calendar Days prior to the first training session. The material will be returned as either "NO EXCEPTIONS TAKEN", "EXCEPTIONS NOTED" or "EXCEPTIONS NOTED - RESUBMIT".

.1 Lesson plan and supplemental training manuals, handouts, visual aids and other reference material required for each training session.

.2 Submit proposed lesson plan not less than twenty-one (21) Calendar Days prior to scheduled training and revise as necessary for acceptance.

.3 Lesson Plan: When training of the City personnel is specified, prepare for each required course, a lesson plan containing but not limited to the following information:

.1 Title and objectives.

.2 Recommended types of attendees (e.g., managers, engineers, operators, maintenance).

.3 Course description and outline of course content.

.4 Format (e.g., lecture, self-study, demonstration, hands-on).

.5 Instruction materials and equipment requirements, including supplemental training manuals, handouts, visual aids and other reference material required for each training session.

.6 Resumes of instructors providing the training.

.4 Training Schedule:

.1 Submit not less than twenty-one (21) Calendar Days prior to start of equipment installation and revise as necessary for acceptance.

.2 List specified equipment and systems that require training services and show:

.1 Respective Supplier.

.2 Estimated dates for installation completion.

.1 Training schedule to include:

.1 Course name;

.2 Course Lesson Plan submittal dates;

.3 Planned session dates and durations; and

.4 Planned Training Participant Groups.

.3 Adjust schedule to ensure training of appropriate personnel as deemed necessary by the City, and to allow full participation by Supplier's Representatives. Adjust schedule for interruptions in operability of equipment.

.4 Individual sessions shall not exceed four (4) hours. A break should be incorporated into sessions that exceed two (2) hours. Training session anticipated to exceed four (4) hours can be assigned to multiple-sessions; however, no more than one (1) – 3-hour and one (1) - 4-hour sessions (seven (7) hours total) may be delivered to the same participants in a single day. Two (2) successive 4-hour sessions may be delivered to alternating shifts of attendees in a single day (i.e., one group of attendees in the morning, and a second group of attendees in the afternoon). Training sessions requiring more than seven (7) hours may be delivered on separate days.

.5 Classes shall not be scheduled concurrently.

1.3 Location and Training Facilities

.1 The City shall provide the classroom training facilities.

.2 Field training sessions shall take place at the equipment location.

1.4 Format and Content

.1 The training program shall:

.1 Provide a high-level overview of maintenance requirements. Include a point-form outline of maintenance intervals consistent with the summary form in Section 01 78 00.

.2 Ensure training covers all aspects of the unit needed by operations or maintenance staff (such as operating the system locally, operating the system remotely, reviewing alarms and actions required, operating the system during fault or upset, returning the system to normal operating condition, etc.)

.3 Ensure training covers all aspects of the Process Control System (PCS) including screens and graphics, screen navigation, pre-configured and custom trending, pop-up dialog boxes, alarm management, remote/local and manual/automatic operating modes, and any programmed sequences.

.2 The training sessions shall be comprised of both classroom training and field training. As a minimum, they shall cover the following topics for each item of equipment or system:

.1 Classroom training shall cover:

.1 Familiarization.

.2 Safety.

.3 Operation, including reviewing alarms and required actions;

.4 Troubleshooting;

.5 Preventative and predictive maintenance;

.6 Corrective maintenance;

.7 Parts; and

.8 Local representation.

.2 Field Training:

.1 As a minimum, field equipment training for operations personnel shall include:

.1 Identification of equipment: location of primary element; location of instrument readout; discussion on purpose, basic operation, and information interpretation.

.2 Identification of instrumentation and calibration, if applicable.

.3 Discussion and demonstration of standard operating procedures, safe work procedure, and daily visual inspection of system operations.

.4 Discussion and demonstration of the preventative maintenance activities, and predictive maintenance activities where applicable.

.5 Discussion and demonstration of start-up and shutdown procedures.

.6 Demonstration of routine disassembly and assembly of equipment.

.7 Identification and review of safety items and demonstration of safety procedures.

.8 Review of Operation and Maintenance Manuals.

.9 Demonstration of operating parameter adjustment for optimized equipment and system operation.

1.5 Training Deliverables

.1 Supplier shall provide all material used in the training to the City;

1.6 Training Material

.1 The Training Material shall be provided in electronic native, editable file format.

.2 The Training Material shall be organized by course, with all material used and collected from Participant Groups during training systematically arranged in a consistent manner.

1.7 Training Completion Forms

.1 Form T1, attached to this Specification, shall be signed by the trainer, the Contract Administrator, and by a City Staff representative for each City shift when classroom training has been completed. One (1) form is to be used for each item of equipment and each system for which training has been provided. Once all classroom training sessions have been completed, Form T1 is to be submitted to the Contract Administrator.

.2 Form T2, attached to this Specification, shall be signed by the trainer, the Contract Administrator, and by a City Staff representative for each City shift when field training has been completed. One (1) form shall be used for each item of equipment and each system for which training has been provided. Once all field training sessions have been completed, Form T2 shall be submitted to the Contract Administrator.

.3 The supply of adequate training, including completion of Forms T1 and T2 shall be a required prerequisite for handover of equipment, as appropriate to the City.

1.8 Supplement

.1 Supplements listed below, following “End of Section,” are a part of this Specification:

.1 Form T1 Certificate of Satisfactory Classroom Training.

.2 Form T2 Certificate of Satisfactory Field Training.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

CERTIFICATE OF SATISFACTORY TRAINING
FORM T1

We certify that the classroom training for the equipment listed below has been provided as per the Specifications.

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

_____ _____
(Trainer) Date

_____ _____
(City Staff Representative) Date

_____ _____
(Contract Administrator) Date

CERTIFICATE OF SATISFACTORY TRAINING
FORM T2

We certify that the field training for the equipment listed below has been provided as per the Specifications.

PROJECT: _____

ITEM OF EQUIPMENT: _____

TAG NO: _____

REFERENCE SPECIFICATION: _____

_____ _____
(Trainer) Date

_____ _____
(City Staff Representative) Date

_____ _____
(Contract Administrator) Date

COMMISSIONING PLAN

1. GENERAL

1.1 Description

.1 Provide a complete and fully functional system ensuring that:

.1 City personnel have been fully trained in aspects of installed systems as per Section 01 79 00.

.2 Documentation relating to installed equipment and systems has been completed as per Section 01 65 00.

.2 The Supplier shall cooperate with Construction Contractor in all commissioning activities pertaining to the supplied equipment.

.3 The Supplier shall cooperate with Construction Contractor to develop a Detailed Commissioning Plan and Commissioning Schedule using this Section as a Base Commissioning Plan.

.4 Use this Section as a master planning document for Commissioning as it:

.1 Outlines organization, scheduling, allocation of resources, and documentation pertaining to implementation of Commissioning.

.2 Communicates responsibilities of team members involved in Commissioning including scheduling, documentation requirements, and verification procedures.

.3 Sets out deliverables relating to operation, maintenance, process, and administration of Commissioning.

.4 Describes how the process of verification meets the design requirements of the completed Works.

.5 Sets out scope, standards, roles and responsibilities, expectations, deliverables and provides:

.1 An overview of Commissioning.

.2 A general description of elements that make up the Detailed Commissioning Plan.

.3 A process and methodology for successful Commissioning.

.5 The Contract Administrator shall witness and certify tests and reports of results.

.6 Commissioning activities shall be completed before issuance of Substantial Performance.

1.2 Definitions

.1 Acceptance: for the purpose of this Specification Section, acceptance shall be defined as the formal turnover of a system to the City. This shall occur after the successful end of Commissioning of each system through a formal acknowledgement between the Contract

Administrator, the City, and the Contractor. Success of the Commissioning period is determined by the Contract Administrator.

.2 Base Commissioning Plan: General Commissioning requirements within this Section to be used in the development of a Detailed Commissioning Plan.

.3 Commissioning: for the purpose of this Specification Section, Commissioning shall be defined as the successful completion of the Operating Test specified in Section 26 12 13.

.4 Commissioning Agent: Agent of the Contractor with experience in Commissioning, satisfactory to the Contract Administrator, responsible for the oversight and execution of Commissioning.

.5 Commissioning Report: the final Commissioning document as described in Clause 3.13.

.6 Commissioning Schedule: Gantt chart showing planned dates for performing all activities related to commissioning of all upgraded systems. The Commissioning Schedule is to be developed by the Contractor and submitted to the Contract Administrator for review, as described in Clause 3.1. The Supplier shall provide input as necessary.

.7 Detailed Commissioning Plan: Commissioning Plan developed by Contractor from the Base Commissioning Plan to be submitted and reviewed by the Contract Administrator, as described in Clause 3.2. Unless defined as “Base Commissioning Plan”, all other instances of “Commissioning Plan” refer to the Detailed Commissioning Plan.

.8 System: for the purpose of this Specification Section, a system shall be defined as the equipment, piping, controls, ancillary devices, electrical power, etc., which together perform a specific function at the facility.

1.3 Submittals

.1 Provide submittals in accordance with Section 01 33 00.

.2 Commissioning Schedule to be submitted and accepted by the Contract Administrator as per Clause 3.1.

.3 Detailed Commissioning Plan to be submitted and accepted by the Contract Administrator as per Clause 3.2.

.4 Detailed Commissioning Plan to be refined and resubmitted as required during the construction phase as per Clause 3.3.

1.4 Composition, Roles, and Responsibilities of Commissioning Team

.1 Commissioning Team to consist of the following members:

.1 Contract Administrator who is responsible for:

.1 Monitoring Commissioning activities.

.2 Witnessing and certifying reported results.

.3 Reviewing and approving Contractor submissions.

.4 Assisting in the resolution of issues resulting from all tests.

.5 Reviewing the final Commissioning Report.

.2 City personnel who are responsible for:

.1 Attending Commissioning activities to verify re-installed existing equipment operates as per the original sequence of operations.

.2 Attending Commissioning activities to verify newly installed equipment operates as intended.

.3 Performing necessary testing as noted in Clause 1.5.1.

.3 Construction Team: Contractor, Subcontractors, suppliers, and support disciplines, who are responsible for construction and/or installation in accordance with Contract Documents, including:

.1 Testing.

.2 Mechanical testing, adjusting and balancing (TAB).

.3 Integrating Commissioning Activities into the Contractor's Project Schedule.

.4 Performing and documenting equipment installation as per Specification Section 01 65 00.

.5 Performing and documenting start-up including installation and start-up checklists.

.4 Contractor's Commissioning Agent who shall be responsible for implementing specified Commissioning activities including:

.1 Planning and preparing checklists (installation/start-up checklists as required, product information) and test procedures.

.2 Determining operational training requirements.

.3 Developing a Detailed Commissioning Plan, updating information provided in the Base Commissioning Plan.

.4 Performing and documenting Running Test and Performance Testing.

.5 Preparing and updating issues logs.

.6 Verifying, reviewing, and conducting training.

.7 Preparing final Commissioning Report.

1.5 Extent of Commissioning

.1 Testing of electrical MCCs must be completed before proceeding with Commissioning activities.

.1 Testing after the electrical modifications shall conform to CSA C22.2 No. 14, CSA C22.2 No. 286 and related CSA standards. CSA special inspections shall be coordinated by the Contractor after operation is confirmed.

2. PRODUCTS

2.1 Equipment

.1 Provide sufficient instrumentation at the Supplier's expense to verify and commission the installed systems.

3. EXECUTION

3.1 Commissioning Schedule

.1 Provide input to the Construction Contractor as they prepare a detailed Commissioning Schedule. The Construction Contractor will submit to the Contract Administrator for review and approval at the same time as the Project Schedule. Include milestones, testing, documentation, training, and Commissioning activities of components, equipment, subsystems, systems, and integrated systems.

.2 After approval, incorporate the Commissioning Schedule into the Project Schedule.

.3 Contractor, Contractor's Commissioning Agent, and Contract Administrator will monitor progress of Commissioning against the approved Commissioning Schedule.

3.2 Development of Commissioning Plan

.1 This Section is to be considered a Base Commissioning Plan for the equipment, to be used by the Construction Contractor in the development of a Detailed Commissioning Plan. Provide assistance to the Construction Contractor when requested by the Construction Contractor.

.2 The Detailed Commissioning Plan and associated Commissioning Schedule shall be approved by the Contract Administrator at least twenty (20) Business Days prior to the planned start of Commissioning. The plan shall comply with the requirements that have been established by the Contract Administrator.

.3 The Detailed Commissioning Plan shall be drafted by the Contractor and reviewed by the Contract Administrator and shall incorporate the contents of the Base Commissioning Plan as specified in this Section. The Detailed Commissioning Plan shall include the following:

.1 Inform the Contract Administrator at least fifteen (15) Business Days in advance of conducting the tests and arrange for the attendance of the Manufacturer's Representative. The tests may be concurrent with the inspection of satisfactory installation if mutually agreed by the Contractor and the Contract Administrator.

.2 The Manufacturer's Representative shall conduct all necessary checks to the equipment and advise the Contractor of any further checking, flushing, cleaning, or other work needed prior to confirming the equipment is ready to run.

.3 Contingency plans in the event of a process malfunction.

.4 Drawings and sketches as required to illustrate the planned sequence of events.

.5 List and details for all temporary equipment or component (additional spool pieces, etc.) required to facilitate Commissioning.

.6 List of all personnel who the Contractor plans to be in attendance for Commissioning and handover with information indicating their qualifications for this Work.

.4 The Detailed Commissioning Plan shall take into account:

.1 Approved Shop Drawings and product data.

.2 Approved changes to the Contract.

.3 Project Schedule.

.4 Contractor's, Subcontractor's, and Suppliers' requirements.

.5 Project construction team's and Commissioning team's requirements.

.5 The Detailed Commissioning Plan shall include:

.1 Commissioning Schedule.

.2 Installation and start-up check lists provided by Manufacturers and Suppliers.

.3 Manufacturer Performance Testing forms provided by Manufacturers and Suppliers.

.1 Forms to include testing parameters at full range of operating conditions to verify responses of equipment and systems.

.6 Submit the completed Detailed Commissioning Plan to the Contract Administrator for review and acceptance. The Detailed Commissioning Plan shall be reviewed prior to its implementation. The Contract Administrator shall be the final arbiter.

3.3 Refinement of Commissioning Plan

.1 During the construction phase, the Construction Contractor will revise, refine, and update the Detailed Commissioning Plan to include approved design and construction changes. Provide input to the Construction Contractor as required.

.1 At each revision, indicate revision number and date.

.2 The Construction Contractor will submit each revised Detailed Commissioning Plan to the Contract Administrator for review and acceptance.

3.4 Equipment

.1 All process, electrical, control, and miscellaneous equipment related to the system shall be successfully installed and tested in accordance with Section 01 65 00, this Section, and any specific requirements noted in other Divisions. Form 103 shall be executed for each MCC.

.2 Temporary equipment or components will be installed and tested as necessary to ensure that it functions reliably and consistently through the Commissioning period.

3.5 Controls

.1 All controls which are the responsibility of this Contractor shall be installed and tested prior to Commissioning.

.2 The Contract Administrator shall arrange for the simulation of the control sequences or shall allow for the operation of the system without the features included in the Work of others. Every effort shall be made to ensure that the Commissioning period provides for the full and comprehensive operation of the equipment under all anticipated normal and adverse operating conditions.

.3 In the event that achieving adverse operating condition was deemed impractical by the City operation, the I/O signals may be manipulated to achieve the necessary reaction of the system.

3.6 Plant Utility Service

.1 The City shall provide power and other ancillary services as necessary to operate the facility through the Commissioning period. Provision of these services shall be limited to reasonable levels.

3.7 Manpower

.1 Supply all staff required during Commissioning as necessary to assist the City's staff in the operation of the facility.

.2 Supply competent staff capable of maintaining, repairing, and adjusting the equipment and controls to achieve the intended design functions during the Commissioning period.

.3 Ensure equipment Supplier's Representatives are available as necessary to certify adjustments in equipment, to guide in setting correct operating limits, and to generally provide input as required for the appropriate operation of the equipment.

3.8 Operating Descriptions

.1 Operating descriptions shall be prepared by the Contract Administrator for the facility systems. Other information outlining the operating requirements shall also be available from the Contract Administrator. The Supplier and the Construction Contractor will review these descriptions and shall make themselves familiar with the requirements in order that they can undertake Commissioning in an appropriate manner.

.1 Operating descriptions shall be considered part of documentation for systems as listed in Clause 3.13.2.

3.9 Design Parameters

.1 Design parameters for the system shall be as defined in the Specifications and/or the operating descriptions.

3.10 Pre-Commissioning Activities

.1 Conduct pre-start-up pressure, static, flushing, cleaning, "bumping" testing, and loop validation during construction as specified in the individual sections. This testing shall be witnessed and certified by the Contract Administrator and does not form part of Commissioning specifications. Include completed documentation with the Final Commissioning Report.

.2 Perform prestart up inspections prior to commencing Commissioning. Utilise approved installation and start-up check lists if required. Rectify any deficiencies to the Contract Administrator's satisfaction. Include completed documentation with the Final Commissioning Report.

.3 Pre-commissioning activities shall include, at minimum:

.1 Process systems:

.1 "Bump" each item of equipment in its "stand-alone" mode.

.2 Complete pre-start-up checks and complete relevant documentation.

.3 After equipment has been started, test related systems in conjunction with control systems on a system-by-system basis.

3.11 Commissioning of Instrumentation and Control

.1 Commissioning activities shall only proceed after instrumentation and control tests have been completed.

.2 A minimum written notice of two (2) weeks shall be required prior to commencing with process commissioning activities. To qualify for process commissioning the following activities shall be completed:

.1 Instrument calibrations;

.2 Initial Control Settings and adjustments have been made;

.3 All field devices have been set-up;

.4 Forms (i.e., 100 forms) have been completed;

.5 PLC/SCADA IO and loop checks have been completed; and

.6 Proper mounting and connections have been made.

.3 During Commissioning, demonstrate to the Contract Administrator proper calibration and correct operation of instruments and gauges.

.4 Commissioning of the instrumentation and control system shall include but not be limited to the following:

.1 Verify installation of components, wiring connections, and piping connections.

.2 Verify wiring continuity and pipe leak tests.

.3 Verify instrument calibrations and loop tests and provide a written report to the Contract Administrator.

.1 The report shall include record of functional checks and any adjustments required for the instruments and control equipment under operational conditions.

.4 Coordinate instruments and control equipment supplier's service personnel as required for complete system testing.

.5 Coordinate and cooperate with the City, Contract Administrator, and other contractors to commission the Control System I/O points.

.6 Direct plant personnel at hand-over as to final adjustment of the system for correct operation of plant as per Section 01 79 00.

.7 Ensure that the instrumentation and control equipment suppliers cooperate to complete the Work.

.8 Verify signal levels and wiring connections to all instrumentation and control equipment.

3.12 Start-Up and Commissioning of Equipment

.1 A Supplier’s Representative shall conduct all necessary checks to the equipment prior to start-up as described in Section 01 65 00.

.2 Following the installation and calibration of the equipment, the Construction Contractor shall perform an Operating Test of equipment which will be witnessed by the Supplier’s Representative and the Contract Administrator. It will be the responsibility of the Construction Contractor to arrange the times for testing and start-up activities. The Construction Contractor shall confirm that these times are acceptable to the Contract Administrator and the City.

.1 During the Operating Test, the Contractor shall operate equipment as required to meet the requirements from all Divisions of this Specification.

.2 If required, the Contractor shall supply any ancillary equipment or services required to complete the testing.

.3 Should the testing reveal any defects, then those defects shall be documented and promptly rectified, and the testing shall be repeated to the satisfaction of the Contract Administrator. Even if this shall require repeating of all commission procedures from the beginning, it will be at the sole discretion of the Contract Administrator.

.4 Additional costs incurred by the Contractor due to repeat testing shall be borne by the Contractor.

.3 On successful completion of the Operating Test, Form 103 – Certificate of Equipment Satisfactory Operating Test Performance (attached to this Specification) will be signed by the Supplier’s Representative, the Contractor, and the Contract Administrator. Form 103 is required after testing of each MCC.

3.13 Final Commissioning Report

.1 Construction Contractor to submit the completed Commissioning Report within a maximum of two (2) weeks of completion of Commissioning. The final Commissioning Report is to be reviewed and accepted by the Contract Administrator prior to granting Substantial Performance. The Supplier shall provide documentation as required.

.2 Final Commissioning Report shall include:

.1 Start-up, pre- Commissioning activities, and documentation for systems and equipment.

.2 Description of Commissioning activities and documentation.

.3 Description of Commissioning of integrated systems and documentation.

.4 Completed installation checklists.

.5 Completed Running Test Report(s).

.6 Final settings of commissioned equipment.

.7 Training Plans.

.3 Before the final Commissioning Report is accepted, individual reported results to be subject to verification by the Contract Administrator.

3.14 Training Plans

.1 Refer to Specification Section 01 79 00 for demonstration and training requirements.

3.15 Supplements

.1 The supplement listed below, following “End of Section”, is part of this Specification:

.1 Form 103 – Certificate of Equipment Satisfactory Operating Test Performance.

END OF SECTION

CERTIFICATE OF EQUIPMENT SATISFACTORY OPERATING TEST PERFORMANCE
FORM 103

We certify that the equipment listed below has been operated and tested as per the Specifications and that the equipment meets its Operating Test criteria. No defects in the equipment were found. The equipment is therefore classed as “conforming”.

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

_____ _____
(Authorized Signing Representative of the Supplier) Date

_____ _____
(Authorized Signing Representative of the Contractor) Date

_____ _____
(Authorized Signing Representative of the Contract Administrator) Date

Acknowledgement of Receipt of O&M Manuals.

_____ _____
(Authorized Signing Representative of the City) Date

1. GENERAL

1.1 Description

.1 This section specifies the requirements for the design, fabrication, inspection, testing, delivery, commissioning and start-up assistance of motor control centres (MCC).

.2 This section applies to 480VAC and 600VAC equipment. See Drawings for project specific data, electrical characteristics and component requirements of the MCC equipment under this Contract.

1.2 Reference Standards

.1 References to documents shall mean the latest published edition of the referenced document in effect at the project bid date.

.2 Conform to the following reference standards:

.1 Manitoba Electrical Code.

.2 CSA 22.2 No. 14.

.3 CSA 22.1 Canadian Electrical Code.

.4 CSA C22.2 NO. 254

.5 NEMA.

.6 CAN in Automation (CiA).

.7 IEEE C37.20.7 Guide for testing Metal-Enclosed Switchgear Rated up to 38kV for Internal Arcing Faults.

.8 IEEE 519 - IEEE Recommended Practice and Requirements for Harmonic Control in Electric Power Systems.

.3 Equipment shall carry a CSA label or approval label from the Safety Engineering Services Branch of the Province of Manitoba.

1.3 Quality Assurance

.1 The following terms are used for the purpose of describing quality assurance and testing requirements:

.1 Factory Acceptance Tests: testing of assembled system prior to shipping to Site.

.2 Field Tests: testing of installed system prior to or as part of the start-up phase; refer to Section 3 of this Specification.

1.4 Control Scheme

.1 Motor control, and instrumentation and control schematic diagrams define the components which are to be provided as part of the MCC, and components which are external to the MCC.

.2 Typical motor control schematics are included in the Contract Drawings.

1.5 Submittals

.1 Provide submittals in accordance with Specification Section 01 33 00.

.2 Submit Shop Drawings and indicate:

.1 Outline dimensions and front view elevations.

.2 Configuration of identified compartments.

.3 Floor anchoring method and dimensioned foundation template, recommended sizing and material specification of anchor bolts as per seismic calculations.

.4 Cable entry and exit locations.

.5 Dimensioned position and size of busbars and details of provision for future extension.

.6 Schematic and wiring diagrams with tentative settings and/or sizes for circuit breakers, fuses, overload relays, contactors as applicable.

.7 Detailed, scaled layout of non-standard unit compartments. Drawing Scale is 1:5 or larger.

.8 Power and control schematics showing each size or type of metering, variable frequency drives (VFD), harmonic filters, ground fault detector, motor starters, thermistor relays, and the like as applicable. Where more than one (1) MCC is being supplied, each MCC shall have its own complete set of power and control schematics.

.9 Nameplate engraving list.

.3 Closeout Submittals: provide operation and maintenance data for MCC for incorporation into manual as specified in Specification Section 01 78 00.

.1 Include data for each type and style of starter.

.4 Adhere to line numbers, equipment and wire number method indicated on the Drawings.

.5 List of starters and feeder tap compartments indicating the size and type of circuit protection.

.6 Interrupting, withstand and continuous current rating of:

.1 Bus bars.

.2 Feeder tap units.

.3 Starter units.

.4 Main incoming unit.

.7 A copy of this specification section with addenda updates, and all referenced sections with addenda updates, with each paragraph check marked to show specification compliance or marked to show deviations.

.8 The Contract Administrator will advise the Contractor of all equipment numbers and descriptions where those data are missing from the contract drawings. Manufacturer's certified drawings and nameplate engravings shall not be made until this data has been approved by the Contract Administrator.

1.6 Shipment, Protection and Storage

.1 Refer to Specification Section 01 61 00 for storage, handling and protection requirements.

1.7 Extra Materials

.1 Provide maintenance materials.

.2 Include: five (5) control fuses, control transformer, HOA selector switch and contact blocks, and five (5) lamps.

2. PRODUCTS

2.1 Manufacturer

.1 Acceptable Manufacturers:

.1 Schneider Electric as City of Winnipeg – Standardized Goods agreement.

2.2 Ratings

.1 Unless otherwise noted, starters, contactors, relays, switches shall be NEMA-rated.

2.3 Supply Characteristics

.1 600 V, 60 Hz, 3 phase, 3 wire, neutral grounded at upstream NGR as indicated.

.1 The MCC shall be suitable for operation at the specified voltages and short circuit capacities. The MCC equipment shall be suitable for minimum fault levels of 42 kAIC symmetrical unless otherwise noted.

.2 There is no requirement for the 600V MCC to be arc-resistant.

.2 480 V, 60 Hz, 3 phase, 4 wire, neutral bus, and neutral - grounding link within MCC.

.1 The MCC shall be suitable for operation at the specified voltages and short circuit capacities. The MCC equipment shall be suitable for minimum fault levels of 42 kAIC symmetrical unless otherwise noted.

.2 MCC shall be arc-resistant, to IEEE C37.20.7

2.4 General Description

.1 MCCs shall comply with the WWD Electrical Design Guide.

.2 Compartmentalized vertical sections with common power bus bars.

.3 Floor mounting, free standing, enclosed dead front.

.4 Indoor NEMA Type 12 gasketed enclosure. Provide neoprene gaskets. Foam type gaskets are not acceptable.

.5 Accommodating incoming feeder cables, combination starters, feeder units with circuit breakers, variable frequency drives, harmonic filters, other equipment and the ancillary system components as indicated.

.6 Front mounting as indicated.

.7 NEMA Class I wiring. Where there is inter-wiring between unit compartments, provide NEMA Class II wiring.

.8 NEMA Type B wiring with plug-in disconnect type terminal blocks.

.9 Bus work shall be rated to withstand the minimum kA rms symmetrical current noted above or as indicated on the drawings for the MCC. All breakers and combination starter and drive units within the MCC shall be rated to interrupt the same kA rms symmetrical current of the rating of the MCC or higher.

.10 Temporary lifting lugs for slinging of assembly.

.11 MCC is to provide an integrated hardware, software, and communication solution.

2.5 Space Requirement

.1 Maximum dimensions for equipment are noted on the equipment elevation Drawings based on the Manufacturer’s typical published dimensions.

.2 Equipment exceeding the maximum dimensions shown will be rejected unless specifically authorized in writing by the Contract Administrator per the procedure described as follows.

.1 Authorization will be based on confirmation from the Administrator that all conflicts resulting from the revised equipment layout have been addressed to the satisfaction of the City.

.2 Submit a dimensioned layout sketch of the assembly at the time of Quotation. Where equipment specified under other sections such as VFDs and harmonic filters are included in the MCC, it is the responsibility of the vendor under this Section to ensure that the overall maximum allowable dimensions of the equipment lineup will not be exceeded due to spatial requirements of incorporated components.

.3 If additional space is required for the MCC, including spaces that have been allowed for on the Drawings, submit a dimensioned layout sketch of the assembly at the time of Quotation.

2.6 Vertical Section Construction

.1 Independent vertical sections fabricated from rolled flat steel sheets minimum of 1.8 mm thick, bolted together to form rigid, completely-enclosed assembly.

.2 Each vertical section divided into compartment units, as required.

.3 Each unit to have complete top and bottom steel plate for isolation between units.

.4 Horizontal wireways, equipped with cable supports, across top and bottom, extending full width of MCC, isolated from busbars by steel barriers.

.5 Vertical wireways complete with doors for load and control conductors extending full height of vertical sections, and equipped with cable tie supports. Installation wiring to units accessible with doors open and units in place.

.6 Provide openings, with removal cover-plates, inside of vertical sections for horizontal wiring between sections.

.7 Include provision for incoming and outgoing wiring to enter at top or bottom, with terminals as indicated.

.8 A removable lifting angle shall be mounted on top, extending the width of the MCC.

.9 Include provision for future extension at both ends of MCC including busbars without need for further drilling, cutting or preparation in field.

.10 Divide assembly for shipment to Site, complete with hardware and instructions for re-assembly.

.11 Each vertical section shall be fitted with a 2-piece removable undrilled glanding plate, split along MCC centreline parallel to front face, 14 gauge minimum, located at the top and bottom of the section.

2.7 Sills

.1 Continuous steel channel floor sills for mounting bases with 19 mm diameter holes for bolts, extending the full length of the MCC lineup. Anchor bolts in accordance with Division 4 (Masonry).

2.8 Busbars

.1 Main horizontal and branch vertical, three phase and neutral high conductivity tin plated copper busbars in separate compartment with bolted connection between vertical and horizontal bus bars, insulated with moulded glass filled polyester, self-cooled, extending entire width and height of MCC, supported on insulators.

.2 Bus Rating:

.1 Main horizontal busbars: minimum 1200A continuous (600V MCC), 1200A continuous (480V MCC), or as indicated.

.2 Branch vertical busbars: minimum 600A continuous, or as indicated.

.3 Neutral bus shall be of identical rating to main bus, for 4-wire MCC (480V).

.3 Provide access for tightening of connections from the front, without the need for tools on the rear of the connection.

.4 Insulated horizontal and vertical bus barriers shall be provided. Barriers to be fabricated from high-strength, glass-filled polyester resin.

.5 Provide NO-IX-ID compound on bus.

.6 Provide branch vertical busbars for distribution of power to units in vertical sections.

.7 No other cable, wires, equipment are permitted in main and branch busbar compartments.

.8 Brace buswork to withstand effects of short-circuit current of 42kA RMS symmetrical.

.9 Bus supports: with high dielectric strength, low moisture absorption, high impact material and long creepage surface designed to discourage collection of dust.

2.9 Ground Bus

.1 Provide copper ground bus size 50 x 6 mm extending entire width of MCC, located at top and bottom, drilled and tapped for lugs as required by CEC for each incoming and outgoing feeder.

.2 Provide a lug to terminate a #4/0 AWG copper ground conductor at each end of the ground bus at the top.

.3 Vertical ground bus strap, full height of section, tied to horizontal ground bus, engaged by plug-in unit ground slab.

2.10 Transient Voltage Surge Suppressor

.1 Supply and install a transient voltage surge suppressor (TVSS).

.2 Requirements:

.1 TVSS units and all components shall be designed, manufactured, and tested in accordance with ANSI/UL-1449.

.2 Voltage: Refer to Drawings.

.3 Maximum continuous operating voltage (MCOV): The MCOV shall not be less than 115% of the nominal system operating voltage. In cases where a neutral grounding resistor is part of the distribution, utilize minimum MCOV levels of 700V L-G and L-L. TVSS units shall be specifically designed for operation with an NGR.

.4 The suppression system shall incorporate thermally protected metal-oxide varistors (MOVs) as the core surge suppression component for the service entrance and all other distribution levels. The system shall not utilize silicon avalanche diodes, selenium cells, air gaps, or other components that may crowbar the system voltage leading to system upset or create any environmental hazards.

.5 Protection Modes – The TVSS must protect all modes of the electrical system being utilized.

.1 3-phase, 3-wire system: L-L and L-G.

.6 Nominal discharge current (In): Each TVSS applied to the distribution shall have a 20kA In rating regardless of the TVSS type (includes Type 1 and 2). Or operating voltage. Any TVSS with an In less than 20kA shall be rejected.

.7 Voltage protection rating (VPR): The maximum ANSI/UL 1449 3rd edition VPR for the device shall not exceed the following:

.1 L-N, L-G, N-G:

.1 120/208 V: 700 V.

.2 600 V: 1500 V.

.2 L-L:

.1 120/208 V: 1200 V.

.2 600 V: 3000 V.

.3 TVSS Design:

.1 Maintenance-free design: The TVSS shall be maintenance-free and shall not require any user intervention throughout its life.

.1 A TVSS containing items such as replaceable modules, replaceable fuses, or replaceable batteries shall not be accepted.

.2 A TVSS requiring any sort of maintenance such as periodic tightening of connections shall not be accepted.

.3 A TVSS requiring user intervention to test the unit via a diagnostic test kit or similar device shall not be accepted.

.2 Balanced suppression platform: the surge current shall be equally distributed to all MOV components to ensure equal stressing and maximum performance. The surge suppression platform must provide equal impedance paths to each matched MOV. Designs incorporating replaceable TVSS modules shall not be accepted.

.3 Electrical noise filter: each unit shall include a high-performance EMI/RFI noise rejection filter. Noise attenuation for electric line noise shall be up to 50 dB from 10 kHz to 100 MHz using the MIL-STD-220A insertion loss test method.

.4 Internal connections: no plug-in component modules or printed circuit boards shall be used as surge current conductors. All internal components shall utilize low impedance conductors.

.5 Monitoring diagnostics: each TVSS shall provide the following integral monitoring options:

.1 Protection status indicators: each unit shall have a green/red solid-state indicator light that reports the status of each protection mode on each phase.

.1 The absence of a green light and the presence of a red light shall indicate that damage has occurred on the respective phase or mode.

.2 All protection status indicators must indicate the actual status of the protection on each phase or mode. If power is removed from any one phase, the indicator lights must continue to indicate the status of the protection on all other phases and protection modes.

.3 Diagnostics packages that simply indicate whether power is present on a particular phase shall not be accepted.

.4 Overcurrent Protection:

.1 The unit shall contain thermally protected MOVs. These thermally protected MOVs shall have a thermal protection element packaged together with the MOV to achieve overcurrent protection of the MOV. The thermal protection element shall disconnect the MOV(s) from the system in a fail-safe manner, should a condition occur that would cause them to enter a thermal runaway condition.

.5 Surge Current Capacity – Refer to the Drawings for required capacity. The minimum surge current capacity the device is capable of withstanding shall be as shown:

.1 600 V MCCs – Not Service Entrance: 42 kA or greater.

.2 480 V MCCs – Not Service Entrance: 42 kA or greater.

.6 Installation Requirements:

.1 The TVSS shall be installed immediately following the load side of the main breaker or main switch.

.2 The MCC shall be capable of re-energizing upon removal of the TVSS.

.3 Utilize a breaker, appropriately rated as directed by the TVSS Manufacturer, to connect the TVSS to the MCC. The TVSS shall be located directly adjacent to the circuit breaker.

.4 The TVSS shall be included and mounted within the MCC (where shown on the Drawings) by the Manufacturer of the MCC.

.1 The complete MCC including the TVSS shall be CSA/cUL listed.

2.11 Unit Compartments, General

.1 Compartments shall be draw-out plug in, self-disconnect type for starter units NEMA size 4 and smaller, circuit breaker units 225 A and smaller. Guide rail supports for units to ensure that stabs make positive contact with vertical bus. Include provision for units to be installed or removed, off load, while buses energized.

.2 Provide compact sized breaker and FVNR starter buckets.

.3 Unit Mounting:

.1 Engaged position – unit stabbed into vertical bus.

.2 Withdrawn position – unit isolated from vertical bus but supported by structure. Terminal block accessible for electrical testing of starter.

.3 Include provision for positive latching in either engaged or withdrawn position and padlocking in withdrawn position. Positive means of grounding unit before stabs engage vertical bus.

.4 Stab-on connectors shall be free floating Tin plated clips, self-aligning, backed up with steel springs.

.4 Provide external operating handle of circuit switch interlocked with door to prevent door opening with switch in "on" position. Defeater mechanism for this interlock. Provision for three (3) padlocks to lock operating handle in "off" position and lock door closed.

.5 Hinge unit doors on same side throughout MCC equipment.

.6 Mount push buttons, selector switches, indicating lights, meters, and the like mounted on compartment door front.

.7 Devices and components shall all be by one (1) Manufacturer to facilitate maintenance.

.8 Unused, spare, or “space” compartments shall be provided with hinged access doors.

.9 Spaces indicated as “Reserved for Future VFD” or “Reserved for Future RVS” shall be prepared spaces suitable for VFD or RVS equipment, in accordance with these Specifications. Spaces shall include pre-wired connection fittings on the CANopen trunk cable system for future use.

.10 Control circuits shall be based on 120VAC in order to allow connection of external 120VAC control devices and interlocks if ever required at present or in future. Low voltage control circuits, other than 120VAC, may be used inside the unit compartments but must include interposing relays and 120VAC control power transformer and circuitry.

2.12 Motor Starters and Control Devices

.1 Provide motor starters and control devices in accordance with Section 26 29 23. All units complete with hand-off-auto selector switch, LED indicator lights for run power and fault, relays, start/stop, reset, electronic programmable overloads and local disconnect.

2.13 Starter Unit Compartments

.1 Units EEMAC size 5 and smaller, circuit breaker units 225A and smaller, plug-in types with self-disconnect. Guide rail supports for units to ensure that stabs make positive contact with vertical bus. Provision for units to be installed or removed, off load, while buses energized.

.2 Unit mounting:

.1 Engaged position – unit stabbed into vertical bus.

.2 Withdrawn position – unit isolated from vertical bus but supported by structure. Terminal block accessible for electrical testing of starter.

.3 Provision for positive latching in either engaged or withdrawn position and padlocking in withdrawn position.

.4 Stab-on connectors free floating tin-plated clips, self-aligning, backed up with steel springs.

.3 External operating handle of circuit switch interlocked with door to prevent door opening with switch in “ON” position. Provision for three padlocks to lock operating handle in “OFF” position and lock door closed.

.4 Hinge unit doors on same side.

.5 Overload relays manually reset from front with door closed.

.6 Pushbuttons and indicating lights mounted on door front.

.7 Devices and components by one Manufacturer to facilitate maintenance.

.8 Pull-apart terminal blocks for power and control to allow removal of starter units without removal of field wiring.

.9 Control wiring shall be extended from each starter module to the control terminal section, including all auxiliary contacts. A multi unit style terminal block having screw type terminal connections shall be installed on standoff supports on back plate.

.10 All terminals shall be number coded or otherwise suitably identified to indicate which section or module of the MCC they are associated with and their function.

.11 Complete control wiring diagrams for each starter with conductor identification clearly shown shall be affixed to the interior cover of the starter section or provide a book of wiring diagrams for all starters in each MCC.

.12 Primary and secondary high rupturing capacity (HRC) fusing shall be installed on the control transformer.

.13 Equip door of each individual unit with a removable plate replaceable with similar plate complete with pushbuttons, pilot lights or selector switches as required. Use pilot lights of push-to-test type and push button of heavy-duty oil tight construction.

.14 MCC cabinets with VFD drives shall have integrated keypad flush mounted on the MCC doors

2.14 Contactors

.1 Contactors: rated to NEMA No. 1CS.

.2 Contactors of size, type and rating as indicated and rated for type of load controlled. Half size contactors will not be accepted. With components as follows:

.1 Contactor solenoid operated, rapid action type or permanent magnet latch-type where specified.

.2 Identify each wire and terminal for external connections, within contactor, with permanent number marking identical to diagram.

.3 For starters size 5 and larger provide 600 V contactor solenoid with 120 VAC interposing relay as detailed in Motor Control Schematics.

.3 Electrically held except as otherwise shown or specified.

.4 Double break weld resistant contacts.

.5 Provide vacuum contactors where indicated.

2.15 Circuit Breaker Units

.1 Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.

.2 Moulded case circuit breakers, arc-fault circuit-interrupters, and ground-fault circuit interrupters: to CSA C22.2 No. 5.

.3 Bolt-On Moulded Case Circuit Breaker: quick-make, quick-break type, for manual and automatic operation with temperature compensation for 40°C ambient.

.4 Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting.

.5 Trip settings on breakers with adjustable trips to range from three (3) to eight (8) times current rating.

.6 Circuit breakers with interchangeable trips as indicated.

.7 Circuit breakers shall clearly indicate fault current withstand ratings.

2.16 Wiring

.1 General:

.1 Provide MCCs with NEMA Class I, Type B wiring. All starter units to have terminal blocks for control wiring. Provide terminal blocks for power wiring for starters size 2 and smaller.

Provide MCCs with all necessary interconnecting wiring and interlocking. Provide elementary and connection diagrams for each starter unit and an interconnection diagram for the entire MCC.

.2 Power Wire:

.1 Power wire to be copper insulated rated 90°C, and sized to suit load; minimum power wire size shall be No. 12 AWG copper stranded.

.3 Control Wire:

.1 Control wire to be No. 14 AWG stranded copper wire, rated 90°C and NEMA listed for panel wiring.

.4 Terminations and Cable Connections:

.1 Terminals: Control wiring to be lugged with ring-tongue or locking spade crimp type terminals made form electrolytic copper, tin-plated.

.2 Cable Connectors: Cable connectors for use with stranded copper wire, sizes No. 8 AWG to 1000 kcmil, to be NEMA listed. Use dished conical washers for each bolted connection. Connectors shall be reusable and shall be rated for use with copper conductors. Provide incoming line and outgoing feeder compartments with crimp type lugs. Load side power conductor sizes shall be in accordance with Manufacturer's standards where not otherwise indicated.

.3 Load wiring sizes will be selected by the Contract Administrator according to voltage drop and cable installation conditional de-rating factors. MCC Manufacturer shall size load cable termination connectors in accordance with the following tables or as indicated on the Drawings:

600 V Equipment	
Load Size Range	**Load Wire Size Range**
Up to 10 HP (10 kVA)	#12 AWG to #10 AWG
10 HP < Load < = 15 HP	#12 AWG to #8 AWG
15 HP < Load < = 20 HP	#10 AWG to #6 AWG
20 HP < Load < = 25 HP	#10 AWG to #4 AWG
25 HP < Load < = 30 HP	#8 AWG to #4 AWG
30 HP < Load < = 40 HP	#8 AWG to #3 AWG
40 HP < Load < = 50 HP	#6 AWG to #1 AWG

.4 Request load wire sizing from Contract Administrator where any loads fall outside of the above ranges.

.5 Provide load wiring terminal blocks suitable for the wiring sizes indicated above where load wiring termination points are not otherwise supplied at that size.

2.17 MCC Metering

.1 Potential transformers: to CSA C13, dry type, compound filled for indoor use, fused with separate fuse block with following characteristics:

.1 Nominal voltage class: as indicated.

.2 Rated frequency: 60 Hz.

.3 Basic impulse level: 10 kV.

.4 Voltage ratio: as required by instrument.

.5 Accuracy rating: to suit instrument.

.2 Current transformers: to CSA C3, dry type, compound filled for indoor use with following characteristics:

.1 Bar-type or donut-type construction.

.2 Nominal voltage class: as indicated.

.3 Rated frequency: 50-400 Hz.

.4 Basic impulse level: 10 kV.

.5 Accuracy rating: to suit instrument.

.6 Rated primary and secondary current: required by instrument.

.7 Positive action automatic short-circuiting device in the secondary terminals. Use “States: type MTS miniature test switches with clear cover.

.8 CT’s shall be provided for both the normal and emergency sources of power where both are present in the MCC’s.

.3 Provide digital multi-function metering package.

.1 Voltage input shall be 120 VAC.

.2 Current inputs shall be 5 amp full scale.

.3 Auxiliary power supply shall be 120 VAC.

.4 Multi-function meter shall have the capability of communication via Ethernet Modbus TCP/IP.

.5 Digital power meter software shall be provided for main plant.

.6 Power metering shall be arranged such that both normal and emergency power are monitored where the MCC has both sources of power. This shall be done by arrangements of the normal and emergency power bus connection such that both sources of power pass through the same set of CT’s.

.7 CT wiring shall use ring terminals on all conductors. Where CT wiring passes through a shipping split there shall be insulated wiring post terminals for each conductor and ring terminals for conductors at each side of the split to join at the wiring posts.

.8 Acceptable Products:

.1 Schneider Electric: Power Logic PM8000 Series.

.2 Or approved equal.

2.18 Equipment Identification

.1 Provide equipment identification in accordance with City of Winnipeg Identification Standards

.2 Mark spaces as “SPACE” and spares as “SPARE.

.3 Nameplate for each MCC size 10, example as follows:

MCC-K710 NORMAL POWER 347/600V, 3Ø, 3W FED FROM SGR-K701

.4 Nameplate for each MCC cell, size 8, example as follows:

P-K501 SUMP PUMP

.5 Individual unit compartments to be identified with engraved nameplates identifying the number of the device and descriptor of the drive or equipment.

.6 Labels clearly visible and positioned such that the removal of the device identified does not remove the label.

2.19 Finishes

.1 Unless specified otherwise, Manufacturer shall paint electrical equipment and materials.

.2 Paint MCC exterior light gray and interiors white.

.3 Galvanized finishes, where specified, to CAN/CSA G64.

.4 Items of fabricated metal which have not been painted as part of a mass production procedure are to be treated as follows:

.1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two (2) coats of finish.

.2 If acceptable to Contract Administrator, clean and touch-up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

.3 Field-clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting and finish with two (2) coats of finish.

.4 If acceptable to Contract Administrator, apply Galvacon touch-up paint to damaged portions of galvanized surfaces and threads.

2.20 Spare Parts and Maintenance Materials

.1 For each size and type of device in use, provide:

.1 Power fuses – three (3) of each size used.

.2 Two (2) control fuses.

.3 Five (5) pilot lamps including a lamp-removing tool if necessary.

.4 One (1) coils for starters and contactors.

.5 Two (2) sets NO/NC auxiliary contacts.

.6 Touch-up paint, two (2) 750 mL aerosol cans.

.7 Any other additional components which the Contractor recommends to be kept as spares.

2.21 Source Quality Control

.1 Provide Manufacturer's type test certificates including short circuit fault damage certification up to short circuit values specified under bus bracing.

.2 Contract Administrator to witness standard factory acceptance testing (FAT) of complete MCC including operation of switches, circuit breakers, starters, and controls.

.1 The FAT testing shall be arranged such that up to two (2) City of Winnipeg or Contract Administrator representatives can attend each testing session at the Contractor shop at no additional charge.

.2 If FAT testing occurs further than 100 km outside of Winnipeg:

.1 Provide hotel accommodations, including a room for each representative, for each day of testing.

.2 Allow for travel costs including milage and/or flight costs for each representative.

.3 FAT testing shall demonstrate all specified functionality in the Specifications and Drawings

.4 Submit FAT test report for Contractor Administrator's approval. Clearly summarize all tests conducted.

2.22 Factory Acceptance Testing

.1 Prepare and submit Factory Acceptance Testing (FAT) plan to the Contract Administrator one (1) month prior to scheduled testing for review and approval.

.1 The FAT Plan shall at a minimum include:

.1 Scope of test including all components under test. This shall include hardware, software, programming, configuration, documentation, etc.

.2 Quality of construction, including visual inspection, wiring, labelling, conformance with project requirements, comparison to shop drawings

.2 Ensure moving and working parts are lubricated where required.

.3 Verify the correct operation of all disconnects, circuit breakers, contactors, interlocks and auxiliary contacts, relays, control switches and push buttons, ground fault protection and manual operation, digital displays etc.

.4 Perform point-to-point tests of all wiring to verify correct connections, continuity and dielectric integrity.

.5 First tests to be done by Manufacturer to ensure proper system operation, free of grounds, open, and short circuits.

.6 Following above tests, notify Contract Administrator to allow for witnessing of official shop tests.

.7 With all sections inter-wired permanently or temporarily and with control power applied, perform:

.1 Functional test of control circuits. Simulate field contacts where necessary.

.2 Insulation resistance test on power and control wiring, free from grounds, open and short circuits.

.8 Submit a certified test report of all standard equipment production tests to the Contract Administrator at time of factory testing.

3. EXECUTION

3.1 Installation

.1 Installation will be carried out by Others.

.2 Refer to Specification Section 01 65 00 for equipment installation requirements.

3.2 Testing and Commissioning

.1 Refer to Specification Section 01 91 31 for commissioning requirements.

.2 Provide commissioning start-up assistance at the site as required in Specification Section 01 91 31. Start-up assistance shall include the onsite presence of at least one MCC Supplier Representative during the commissioning period. A minimum of three (3) days per MCC, assuming three separate trips. Manufacturer's Representative(s) shall be fully familiar with the equipment supplied under this Contract and be factory-trained in the use and application of the Manufacturer's Reduced Voltage Soft Starters (if supplied), and Variable Frequency Drives (if supplied).

.3 The Contractor will provide all necessary PLC program software (if required) and application programming.

.4 All Supplier costs associated with commissioning assistance, including travel, lodging, and per diem living expenses, shall be as specified in the quotation.

3.3 Training

.1 Refer to Specification Section 01 79 00 for demonstration and training requirements.

END OF SECTION

1. GENERAL

1.1 Reference Standards

.1 References to documents shall mean the latest published edition of the referenced document in effect at the project bid date.

.2 Conform to the following reference standards:

.1 CSA, Canadian Standards Association.

.2 NEMA, National Electrical Manufacturer Association.

.3 IEEE, The Institute of Electrical Engineers.

.4 Other, Local Power Utility and Telephone Utility Guidelines for Harmonic Distortion.

1.2 Quality Assurance

.1 Prior to shipment, the Manufacturer shall functionally test the AC drive. The inverter shall be tested by running at full nominal load with a motor.

.2 The Manufacturer shall provide a factory certified test report along with the Variable Frequency Drives (VFD).

1.3 Submittals

.1 Provide Submittals in accordance with Specification Section 01 33 00.

.2 Submit Shop Drawings:

.1 Physical layout in MCC or layout of separate enclosure as applicable.

.2 Wiring diagram showing terminal blocks and terminal numbers.

.1 Provide AutoCAD version of the VFD Drawings upon request.

.3 Material list.

.4 Front panel detail.

.5 Recommended spare component list.

.6 Recommended breaker (molded case switch) & fuse size.

.7 Cooling system and heat rejection calculations for each size / type of VFD.

.8 Completed VFD settings sheets.

.3 Product Data:

.1 Submit Manufacturer's printed product literature, specifications and datasheets and include product characteristics, performance criteria, and limitations

.4 Settings Sheet:

.1 Contractor shall provide VFD Settings Sheets with the O&M manual submission for each VFD.

1.4 Design Requirements

.1 Ventilation system designed for ambient temperature range of 10°C to 35°C. Temperature within the enclosures not to exceed 45°C.

.2 Ventilation system filters.

.3 Ensure wiring and design is appropriate for the type of distribution from which the drives are fed. Where VFDs are fed from high resistance grounded systems (i.e. systems with NGRs), isolate the RFI filters from ground in accordance with the Manufacturer's recommendations.

2. PRODUCTS

2.1 Variable Frequency Drives (VFD)

.1 Voltage Input: 600 VAC or other voltage as per the Drawings.

.2 VFD to be:

.1 CSA Approved.

.2 3-Phase.

.3 Complete with line and load reactors/filters as indicated herein, and as shown on the Drawings.

.1 Line reactors to be a minimum of 3%Z or higher as indicated on the single line drawings.

.4 Designed to provide output requirements dictated by the speed/torque characteristics of motor and driven equipment over the entire speed range.

.5 Capable of re-accelerating the driven equipment, following voltage dips greater than 20% of the rated input power supply, of up to five (5) seconds duration, without the need to come to a complete stop. Vendor shall indicate the maximum time delay before re-acceleration.

.6 Capable to continue operation without coming to a standstill or resulting in a process shutdown, following any momentary voltage dips in the input power supply, auxiliary power supply, or both, of less than 20% rated voltage, which last for less than 0.5 second.

.3 Variable speed controller shall be electronic and allow for the adjustment of frequency and voltage output of the unit.

.4 Motors 75 kW and less to employ a minimum 6-pulse pulse width modulated (PWM) inverter system utilizing Insulated Gate Bipolar Transistors (IGBT) power switching devices.

.5 VFD shall convert the line input power to adjustable AC voltage and frequency output power.

.6 The output power shall be controlled such that permissible volts/Hertz ratio is not exceeded throughout the specified operating speed range, over a voltage range of plus or minus10% and frequency variation of plus or minus 5%.

.7 The VFD output frequency shall not deviate more than plus or minus 1% of any given set point within the operating frequency range.

.8 The VFD shall include radio interference suppression and limit radio interference values to within the limits of local code requirements.

.9 The telephone influence factor shall be in accordance with maximum values specified by local authorities.

.10 Accessories:

.1 Integral flush mounted keypad on the enclosure door (MCC cabinet or standalone enclosure) for programming, monitoring, and operating the drive, accessible through password or other acceptable security measure only.

.2 Integral selector switches and pushbuttons for control on enclosure door.

.1 Standard of acceptance, Square D Harmony XB4 series, or approved equal in accordance with B8.

.3 Selector switches and pushbutton as follows:

.1 Hand/Off/Remote three position-maintained selector switch at the equipment.

.2 VFD/bypass two position-maintained selector switch, if indicated on Drawings.

.3 Manual speed potentiometer, if indicated on Drawings.

.4 Local Emergency Stop button, if indicated on Drawings.

.4 Communication Card: Provide Ethernet connection to all VFDs except for HVAC packaged systems. VFDs integral with packaged HVAC equipment (where a central controller has Ethernet Modbus TCP communication) do not require the communication card.

.11 Diagnostics features:

.1 Integral long life LED indicating lights on enclosure door.

.1 Standard of acceptance, Square D Harmony XB4 series.

.2 Indicating lights as follows:

.1 Running (Green).

.2 VFD Fault (Amber).

.3 Overload Tripped (Amber).

.12 Environmental capabilities: Drive to operate without mechanical or electrical damage under a combination of conditions as follows:

.1 Room ambient temperature: 0°C – 35°C.

.2 Humidity: 0 to 90% (non-condensing).

.3 Vibration: up to 0.5 g.

.4 Altitude: 0 to 1250 m above sea level.

.13 Protective functions to be incorporated are:

.1 VFD failure.

.2 Ground fault in VFD.

.3 Ground fault on converter output.

.4 VFD overcurrent.

.5 Supply system over or under voltage.

.6 Supply system phase voltage unbalance.

.7 DC link fault.

.8 Voltage/frequency ratio incorrect.

.9 5% frequency deviation from the set point.

.10 Loss of control signal.

.11 Control electronics fault.

.12 Electronics motor overload protection adjustable up to 150% of motor rating for 60 seconds.

.13 Motor stalled.

.14 Inverter over temperature.

.14 Acceptable manufacturer

.1 Schnieder Altivar 600/900 series as per City of Winnipeg standardized goods agreement RFP 756-2013.

2.2 Load Reactor

.1 VFD load reactors shall be installed for all motors where cabling between the VFD and motor exceeds 30 m.

.2 The equipment Manufacturer to provide standard sized load reactors unless specifically noted otherwise on the Drawings.

.3 Reactor shall not exceed its temperature limit under all operation conditions.

2.3 Filters

.1 DV/DT Filters shall be installed where power cables between the VFD and the motor exceed 150 m or where recommended by the VFD vendor for the specific size and application.

.2 Size filter for the given load.

2.4 Fuses

.1 Fuses for branch circuit protection to be fast acting Class J or as specified on Drawings.

.2 Fuses shall be installed with a molded case switch. Size accordingly based on load rating.

2.5 Wire Colour Coding

.1 Utilize the following wire colours for the types of voltage/signals indicated:

.1	120 VAC Line:	Black
.2	120 VAC Control	Orange
.3	120 VAC Neutral	White
.4	24 VDC Supply:	Blue
.5	24 VDC Control:	Blue
.6	24 VDC Common:	Blue
.7	24 VAC Supply:	Blue
.8	24 VAC Control:	Blue
.9	24 VAC Neutral:	White
.10	10 VDC Supply:	Blue
.11	0-10 VDC Signal:	Blue
.12	10 VDC Common:	Blue
.13	Intrinsically Safe:	Light Blue

.14 4-20 mA Signal: Blue

2.6 Cooling system

.1 The equipment Manufacturer shall perform heat load analysis to determine air-cooling requirements.

.2 Air-cooled converters shall meet the following:

.1 Redundant cooling fans.

.2 Cooling fan operates when motor is started from VFD or bypass system or when enclosure reaches temperature set point.

.3 Provides adjustable the level set at the temperature switch, with minimum range 10°C to 30°C.

.4 All VFD components shall be rated to operate at full capacity, with full component life expectancy, at 60°C at the components / circuit board level (and at 40°C ambient temperature within the enclosure).

.5 The VFD cooling and heat sink system capacity shall be designed and sized to bring the ambient temperature within the VFD enclosure below 40°C with all components running at full load, and with an electrical room ambient of temperature of 35°C.

3. EXECUTION

3.1 Installation

.1 Refer to Specification Section 01 65 00 for equipment installation requirements.

3.2 Testing and Commissioning

.1 Refer to Specification Section 01 91 31 for commissioning requirements.

3.3 Training

.1 Refer to Specification Section 01 79 00 for demonstration and training requirements.

END OF SECTION

AECOM Imagine it. Delivered.

SHOP DRAWING DISTRIBUTION

PROJECT NAME: NEWPCC UV Upgrade

PAGE 1 of 1

PROJECT NO.: 60711772

CONTRACTOR: EECOL Electric

DATE: January 31, 2025

SUPPLIER/MANUFACTURER Schneider Electric

DATE RECEIVED: January 24, 2025

DRAWING SUBJECT: MCC Shop Drawings

****THIS SHEET MUST REMAIN WITH SHOP DRAWING. DO NOT DETACH!!****

Distribution	**MS**	**SB**					
Comments	**Yes**	**Yes**					

One copy of the following is attached for your review.

Submission No.: 1	SUBMITTAL REVIEW AECOM	
Project No.: 60711772		Discipline: Electrical
	Reviewed - No Comment	Reviewed - Revise and Resubmit
X	Reviewed - As Noted	Review by Consultant Not Required

Review is solely for general conformity with contract. The Consultant does not warrant or represent that information in this submittal is accurate or complete. Review does not relieve Contractor of responsibility for errors/omissions in designs, including this submittal, that are the Contractor's responsibility, and for conforming/correlating with all quantities/dimensions, performing the Work, selecting performance means/methods, coordinating with other parts of the Work/between trades, and performing the Work safely. Notwithstanding this review, Contractor remains solely responsible for contract compliance.

By: S. Boghosian Date: January 31, 2025

CITY OF WINNIPEG NEWPCC UV UPGRADES - AECOM

Approval Drawing Package

Factory Order #: 51085249

01/21/2025

Karli Reeve
Project Manager
North American Operating Division
(587) 288-1426
karli.reeve@se.com

Life Is On | Schneider Electric

Submittal Comments

Date: 01/21/2025

Job Name: CITY OF WINNIPEG NEWPCC UV UPGRADES - AECOM

Factory Order #: 51085249

Contractor Name: N/A

☐ **Approved**
> Release all manufacture
No re-submittal required

☐ **Rejected**
> No release
Re-submit all

☐ **Approved as Noted**
> Release all for manufacture.
Make necessary changes, show
Changes on construction Drawings

☐ **Partial Approval**
Revise and Resubmit
> Release approved sections for manufacture
Re-submit rejected section

The following information is pertinent with the return of this submittal. Please initial the applicable items that you have reviewed and have determined to be correct.

_____ > Lug sizes

_____ > Top or bottom entry for all equipment

_____ > Shipping splits

_____ > Nameplate information

_____ > Orientation of breakers

_____ > Wire sizes

_____ > Amperages of all bus and breakers

_____ > Surface or flush for panels

_____ > Size of all equipment

_____ > AIC ratings

_____ > Copper or aluminum bus

Customer Comments/Rejected Items:

Contractors Signature or Stamp:

_____

Schneider Electric

Approval Drawings

This Approval Drawing Package is submitted as our interpretation of the contract drawings and/or the specifications for this job.

It is the obligation of the electrical contractor and reviewing engineer to determine that the item quantities and accuracy of this submittal is correct as required for the job. Any inaccuracies or deviations must be addressed with Schneider Electric before release to manufacturing. Any releases of material to manufacturing by the above parties constitute an acceptance of the accuracy of the submittal. Any changes after release will be viewed as a change order, subject to pricing changes.

Please take the time to review this package for accuracy to prevent any after-shipment problems. This will allow the job to be shipped correctly and prevent any delay in energization.

Schneider Electric

Good day,

Schneider Electric is committed to delivering your equipment in good condition.

You are the documented receiver for the shipments on the project contained in this Approval Drawing Package.

Please be sure to receive each shipment correctly.

1: Review that material and check the quantities

2: Check for damage to any of the materials before signing the waybill.

If you see damage, or suspect there might be damage, indicate “Damaged” on the waybill. Take pictures of the damage, and contact your Schneider Electric representative for instructions.

- If you sign the waybill without noting the damage, you are accepting the shipment as complete and undamaged.
- Any damage reported after the waybill is signed will be your responsibility.

If you find concealed damage within 24 hours of receiving the shipment, call the carrier.

- Report the damage, and ask for an inspection by the carrier.

Thank you for working with Schneider Electric to ensure you have completed and undamaged shipments.

Schneider Electric

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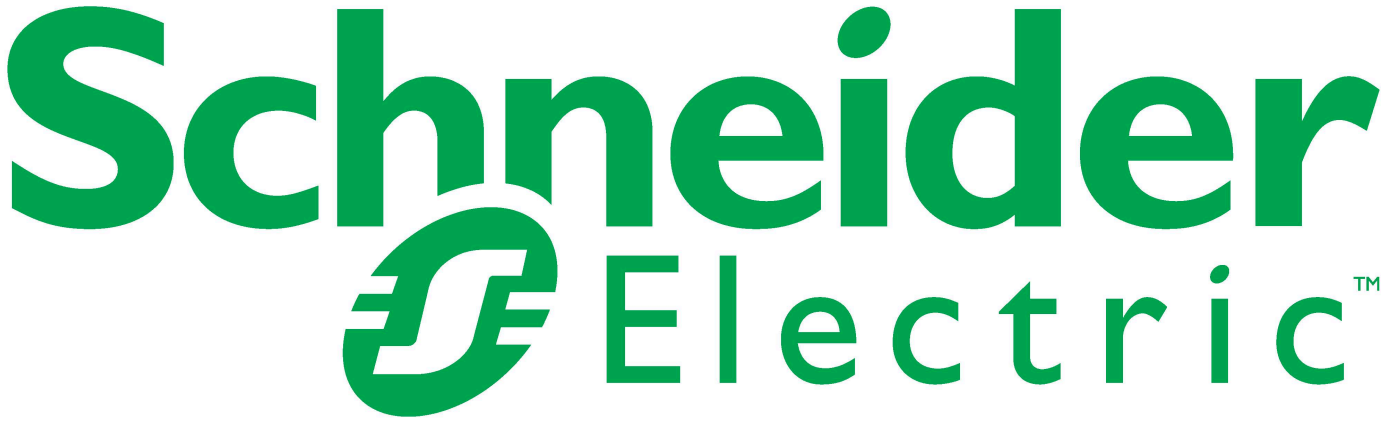
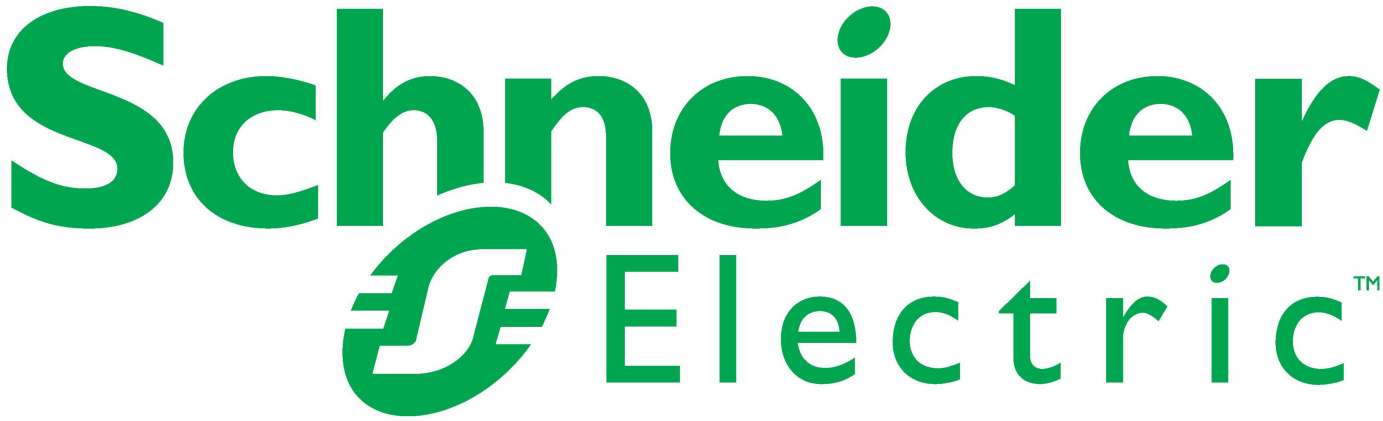


LOW VOLTAGE
MOTOR CONTROL CENTER(S)



BILL OF MATERIALS AND DRAWINGS

ERP Line #	Qty	Product Description
000010	1	**Designation :** MCC-U7301 MCC-U7401 **Product Details:** Model 6 MCC - Industrial Package 1-Model 6 LVMCC-Model 6 MCC - Industrial Package --- Engineered To Order (ETO) --- POWER SYSTEM DATA: System Voltage: 600V 3PH 3W 60Hz System Source Type: 3 Phase Wye System Source Ground Point: Common Point Grounded Max Available Fault Current (RMS): 42kA BUS SYSTEM DATA: Power Bus: 1200A Tin Plated Copper Vertical Bus: 600A Tin Plated Copper Bus Bracing: 42kA Horizontal Ground Bus: 600A Tin Plated Copper Vertical Ground Bus: Tin Plated Copper ENCLOSURE DATA: Enclosure Type: 20" Deep General Purpose Type 1 Gasketed Exterior Color: ANSI 49 Interior Color: White STRUCTURE FEATURES: Equipment Mounting Height: 72" Premium Barrier System including wire trough barriers with fishtape plugs and section barriers Steel Bottom Closure Plate Wire Tie Retainers in Vertical Wireway Two-Piece Top Plate Insulated Bus Ground Bus Lugs Each End of Lineup Rodent Barriers Equipment Nameplate Engraved with White Surface/Black Letters COMMON DEVICE FEATURES: Control Power: 120Vac Wiring Type: Class 1 Type B Wiring Manual Vertical Bus Shutters Drawing Format: PDF - Single Multi Page File Unit Nameplate White Surface / Black Letters PRODUCT ACCESSORIES: Certified Test Report SPECIAL PRICING AND SECTION COUNT DATA: Sections: 1 - 600A top ground bus where feasible (TAG#: SS12) Lineup: 1 - 2nd Master nameplate (TAG#: MCC) 9 - Total Section(s) in Lineup 8 - Section(s) with 600A Tin Plated Copper Vertical Bus 2 - Section(s) with 18" High Pull Box 1 - Section(s) with no Vertical Bus DIMENSIONS AND WEIGHT --- Dimensions: 180.00"W X 20"D X 94.5"H Approximate Weight: 6700.00 lbs / 3039.12 kgs INCOMINGS --- Incoming One: Incoming Connection Type: Cable

Entry Direction: Through the Top

Incoming Two:

Incoming Connection Type: Cable
Entry Direction: Through the Top

MAINS

Main One:

Main Breaker Top Entry 1200A
50kA Interrupting Rating
Aluminum Mechanical Lugs: (4) 3/0 - 500 kcmil Wires/Phase
Electronic Trip Circuit Breaker with Ground Fault
Electronic Trip Unit with Ammeter Long-time + Short-time + Instantaneous + Ground Fault Protection
24Vdc Trip Unit Power Supply
Key Interlock (Single Cylinder)
Component ID Labels: Scr Dwn White Surface/Blk Letters
Ring Tongue Terminal
Heat Shrink Customer Assigned Wire Markers
Device Height - 36 in
Power Meter PM8244 w/ Display, 3 Wire, 3 CTs
#14 AWG MTW Control Wire
Component ID Labels: Scr Dwn White Surface/Blk Letters
Ring Tongue Terminal
Heat Shrink Customer Assigned Wire Markers
Device Height - 6 in
(1) CTA210 Bender ct in pullbox (TAG#: TR140944-1)
(1) Ct shorting terminal (TAG#: MCC)

is this for external GF signal?

Shunt trip unit?

CTUB102-CTBC120

Main Two:

Main Breaker Top Entry 1200A
50kA Interrupting Rating
Aluminum Mechanical Lugs: (4) 3/0 - 500 kcmil Wires/Phase
Electronic Trip Circuit Breaker with Ground Fault
Electronic Trip Unit with Ammeter Long-time + Short-time + Instantaneous + Ground Fault Protection
24Vdc Trip Unit Power Supply
Key Interlock (Single Cylinder)
Component ID Labels: Scr Dwn White Surface/Blk Letters
Ring Tongue Terminal
Heat Shrink Customer Assigned Wire Markers
Device Height - 36 in
Power Meter PM8244 w/ Display, 3 Wire, 3 CTs
#14 AWG MTW Control Wire
Component ID Labels: Scr Dwn White Surface/Blk Letters
Ring Tongue Terminal
Heat Shrink Customer Assigned Wire Markers
Device Height - 6 in
(1) CTA210 Bender ct in pullbox (TAG#: TR140944-1)
(1) CT shorting terminal (TAG#: MCC)

Tie
---
1 - 1200A Tie Breaker
50kA Interrupting Rating
Electronic Trip Circuit Breaker with Ground Fault
Electronic Trip Unit with Ammeter

Long-time + Short-time + Instantaneous + Ground Fault Protection
24Vdc Trip Unit Power Supply
Key Interlock (Single Cylinder)
Component ID Labels: Scr Dwn White Surface/Blk Letters
Heat Shrink Customer Assigned Wire Markers
Device Height - 72 in

Feeders

Devices Associated to Main One:

3 - Circuit Breaker Branch Feeder 300A
50kA Interrupting Rating
Aluminum Mechanical Lugs: (2) 2/0 - 500 kcmil Wires/Phase
Long-time + Short-time + Instantaneous Protection
24Vdc Trip Unit Power Supply
Ring Tongue Terminal
Heat Shrink Customer Assigned Wire Markers
Device Height - 24 in
6 - Compac 6 Circuit Breaker Branch Feeder 15A
50kA Interrupting Rating
Aluminum Mechanical Lugs: (1) 14 - 3/0 AWG Wire/Phase
Device Height - 6 in

COMMON FEEDER FEATURES

Component ID Labels: Scr Dwn White Surface/Blk Letters

Devices Associated to Main Two:

6 - Compac 6 Circuit Breaker Branch Feeder 15A
50kA Interrupting Rating
Aluminum Mechanical Lugs: (1) 14 - 3/0 AWG Wire/Phase
Device Height - 6 in
3 - Circuit Breaker Branch Feeder 300A
50kA Interrupting Rating
Aluminum Mechanical Lugs: (2) 2/0 - 500 kcmil Wires/Phase
Long-time + Short-time + Instantaneous Protection
24Vdc Trip Unit Power Supply
Ring Tongue Terminal
Heat Shrink Customer Assigned Wire Markers
Device Height - 24 in

COMMON FEEDER FEATURES

Component ID Labels: Scr Dwn White Surface/Blk Letters

ADJUSTABLE SPEED DRIVES

Devices Associated to Main One:

1 - Altivar 630 Process AC Drive 20 HP w/Circuit Breaker
Rated for Normal Duty (Overcurrent 110% (60 sec))
CAT# ATV630D15
Motor Protecting Filter
100VA Control Power Transformer
#16 AWG MTW Control Wire
Ethernet (Modbus TCP) Communication
ASD 30mm Type K Pilot Devices

ensure VFDs are rated for 600 Volt, datasheet provided in the submittal show 480Volt

Hand-Off-Auto SW with Manual Speed Potentiometer
Motor On LED Pilot Light: Green Push-to-Test
Motor Off LED Pilot Light: Red Push-to-Test
Fault LED Pilot Light: Yellow Push-to-Test
Component ID Labels: Scr Dwn White Surface/Blk Letters
Ring Tongue Terminal
Heat Shrink Customer Assigned Wire Markers
Device Height - 24 in
(1) FAN THERMOSTAT (TAG#: MCC)
(1) SPECIAL WIRE COLOR (TAG#: MCC)

See attached Schematic diagram for light colors based on CoW standards

Devices Associated to Main Two:

1 - Altivar 630 Process AC Drive 20 HP w/Circuit Breaker
Rated for Normal Duty (Overcurrent 110% (60 sec))
CAT# ATV630D15
Motor Protecting Filter
100VA Control Power Transformer
#16 AWG MTW Control Wire
Ethernet (Modbus TCP) Communication
ASD 30mm Type K Pilot Devices
Hand-Off-Auto SW with Manual Speed Potentiometer
Motor On LED Pilot Light: Green Push-to-Test
Motor Off LED Pilot Light: Red Push-to-Test
Fault LED Pilot Light: Yellow Push-to-Test
Component ID Labels: Scr Dwn White Surface/Blk Letters
Ring Tongue Terminal
Heat Shrink Customer Assigned Wire Markers
Device Height - 24 in
(1) FAN THERMOSTAT (TAG#: MCC)
(1) SPECIAL WIRE COLOR (TAG#: MCC)

MISCELLANEOUS DEVICES

Devices Associated to Main One:

6 - 12" Prepared Space
1 - 12" Special Unit
Component ID Labels: Scr Dwn White Surface/Blk Letters
Heat Shrink Customer Assigned Plastic Sleeve Wire Markers
Device Height - 12 in
(1) (2) Type 460R PT's w/ Fuses (TAG#: MM11)
(1) Door-mount MTS 10 pole test sw (TAG#: TR-138569-2)
CTUB102-CTBC120
(1) CTAC210 for P frame (TAG#: TR-140944-1)
1 - 25 Amps Motor Protecting Filter for Drive
Component ID Labels: Scr Dwn White Surface/Blk Letters
Device Height - 9 in
1 - 6" Prepared Space
1 - 3" Configured Space
1 - Surge Protection Device
Solidly Grounded
120kA Surge Rating
Wye Connected Secondary Transformer - With Circuit Breaker Disconnect
SPD Surge Counter
Component ID Labels: Scr Dwn White Surface/Blk Letters
Device Height - 12 in

Devices Associated to Main Two:

1 - Surge Protection Device
Solidly Grounded
120kA Surge Rating
Wye Connected Secondary Transformer -
With Circuit Breaker Disconnect
SPD Surge Counter
Component ID Labels: Scr Dwn White
Surface/Blk Letters
Device Height - 12 in
1 - 12" Special Unit
Component ID Labels: Scr Dwn White
Surface/Blk Letters
Heat Shrink Customer Assigned Plastic
Sleeve Wire Markers
Device Height - 12 in
(1) (2) Type 460R PT's w/ Fuses (TAG#:
MM11)
(1) Door-mount MTS 10 pole test sw
(TAG#: TR-138569-2)
1 - 25 Amps Motor Protecting Filter for Drive
Component ID Labels: Scr Dwn White
Surface/Blk Letters
Device Height - 9 in
1 - 6" Prepared Space
1 - 3" Configured Space
6 - 12" Prepared Space

SQUARE D
by Schneider Electric

Job Name:	City of Winnipeg NEWPCC UV Upgrades – AE	Square D Quotation #:	51085249
Job Location:	Winnipeg, MB	Quotation Revision #:	
		Sales Contact:	
		Sales Contact Location:	
Purchaser:	93473–EECOL ELECTRIC CORP	Customer:	WILL ADVISE ADDRESS
Purchaser PO #:		Customer PO #:	
User:		Architect:	
User Location:		Cons. Engineer:	0
Drawing Status:	APPROVAL		

TABLE OF CONTENTS

SQUARE D FACTORY ORDER NUMBER:51085249–000010

Equipment Designation	Equipment Type	Drawing Type	Drawing Number	Page	Revision Level
MCC–U7301 MCC–U7401	MODEL 6 MCC	ELEVATION	F51085249–000010–01	1	–
			F51085249–000010–01	2	–
			F51085249–000010–01	3	–
		ONE LINE DIAGRAM	O51085249–000010–01	1	–
			O51085249–000010–01	2	–
		UNIT INFORMATION	I51085249–000010–01	1	–
			I51085249–000010–01	2	–
			I51085249–000010–01	3	–
			I51085249–000010–01	4	–
			I51085249–000010–01	5	–
			I51085249–000010–01	6	–
			I51085249–000010–01	7	–
			I51085249–000010–01	8	–
		ELEMENTARY	E51085249–000010–01	1	–
			E51085249–000010–02	1	–
			E51085249–000010–02	2	–
			E51085249–000010–03	1	–
			E51085249–000010–04	1	–
			E51085249–000010–05	1	–
			E51085249–000010–06	1	–
			E51085249–000010–07	1	–
			E51085249–000010–08	1	–
			E51085249–000010–09	1	–
			E51085249–000010–09	2	–

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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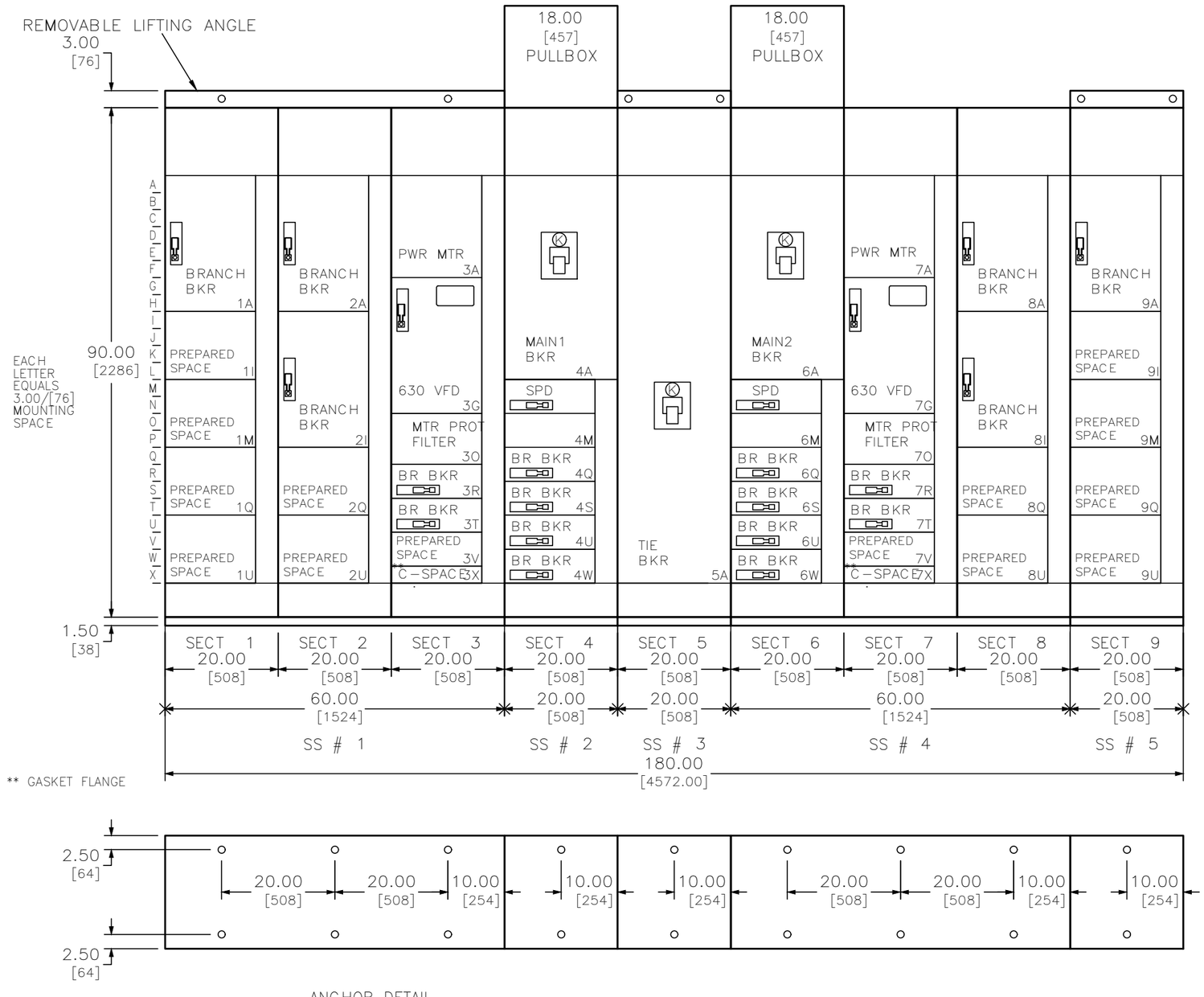

ANCHOR DETAIL

MCC identifier and breaker tags as provided in the SLD

DUAL DIMENSIONS: INCHES MILLIMETERS

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	F51085249–000010–01

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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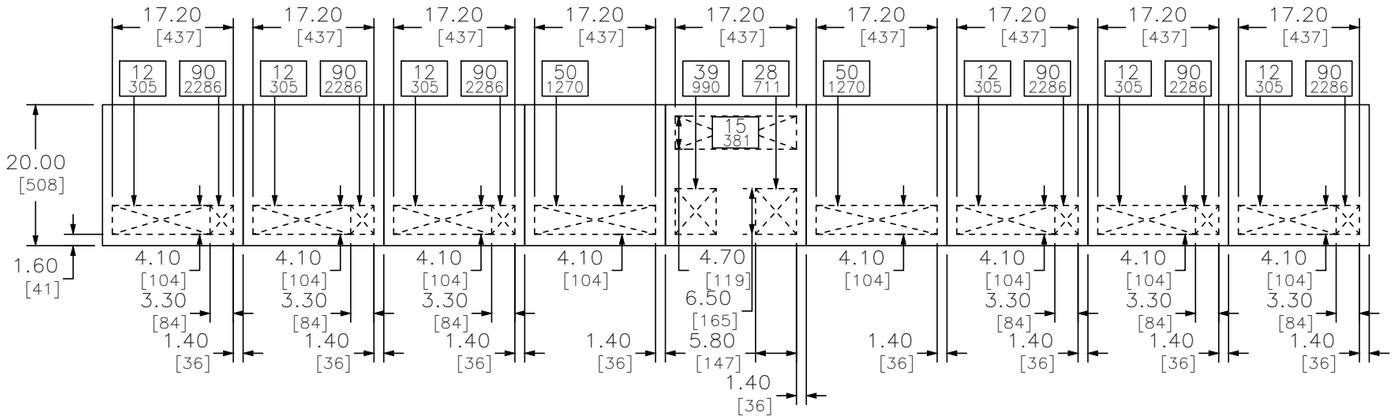
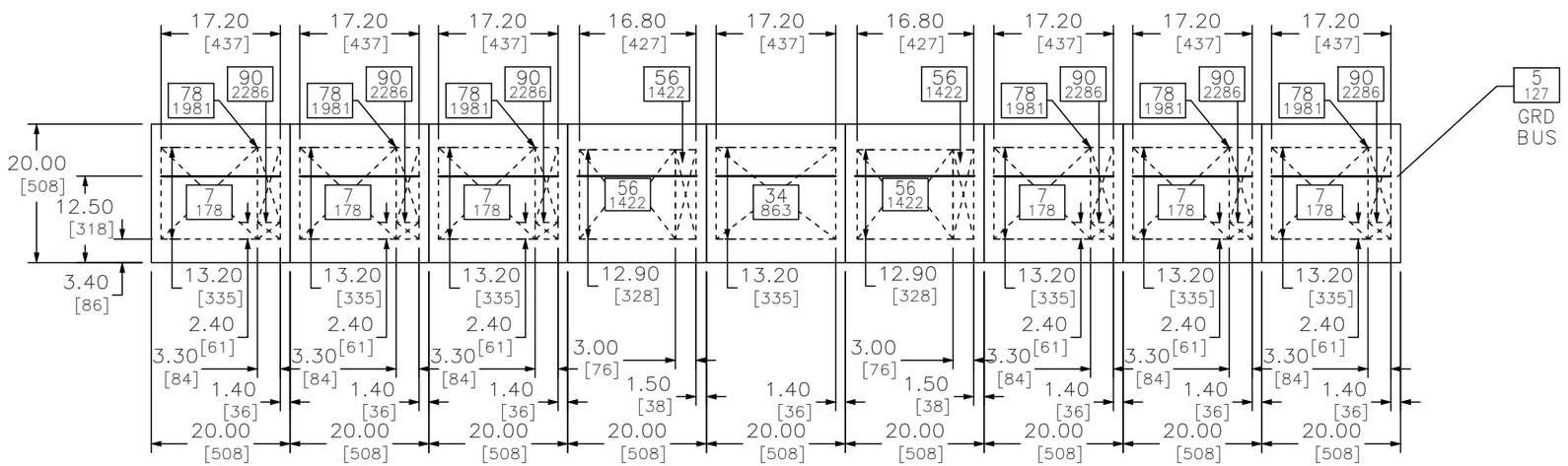


TOP VIEW



FLOOR VIEW

CROSSED AREA REPRESENTS CONDUIT ENTRY AREA. NUMBERS IN BOXES INDICATE VERTICAL CLEARANCE TO NEAREST OBSTRUCTION.

Everything must be top fed, there are no bottom fed provisions available within the existing facility

DUAL DIMENSIONS: INCHES MILLIMETERS

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# F51085249-000010-01	PG 2 OF 3 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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GENERAL NOTES

Class 1 Type B Wiring

PRODUCT DESCRIPTION AND RATINGS

POWER SYSTEM DATA:

600V 3PH 3W 60Hz
POWER SYSTEM GROUND POINT: Common Point Grounded
SHORT CIRCUIT RATING: 42kA
POWER ENTERS: Main1 Breaker Top Section 4
POWER ENTERS: Main2 Breaker Top Section 6
CONTROL POWER: 120Vac

BUS SYSTEM DATA:

MAIN HORIZONTAL BUS: 1200 Amp Tin Plated Copper
BUS BRACING: 42kA
VERTICAL BUS: 600 Amp Tin Plated Copper
HORIZONTAL GROUND BUS: 600 Amp Tin Plated Copper
Units Securely Grounded To Structure

ENCLOSURE DATA:

ENCLOSURE TYPE: 20" DEEP Type 1A
EXTERIOR COLOR: Electrodeposition Finish ANSI 49 Medium Light Grey
INTERIOR COLOR: Electrodeposition Finish White
REMOVABLE 3" [76mm] LIFTING ANGLE

STRUCTURE MODIFICATIONS:

Ground Bus Lugs 1,9
Rodent Barriers 1,9
Manual Bus Shutters 1,2,3,4,6,7,8,9
Premium Barrier System 1,2,3,4,6,7,8,9
600A Vertical Bus 1,2,3,4,6,7,8,9
Copper Vertical Ground Bus 1,2,3,4,6,7,8,9
Wire Retainers 1,2,3,4,6,7,8,9
Equipment Nameplate 1
18" Pullbox 4,6
Top Ground Bus 1,2,3,7,8,9

EQUIPMENT WEIGHT:

SHIPPING SPLIT # 1: 2250.00 Lbs. (1020.60 Kg.)
SHIPPING SPLIT # 2: 750.00 Lbs. (340.20 Kg.)
SHIPPING SPLIT # 3: 700.00 Lbs. (317.52 Kg.)
SHIPPING SPLIT # 4: 2250.00 Lbs. (1020.60 Kg.)
SHIPPING SPLIT # 5: 750.00 Lbs. (340.20 Kg.)
TOTAL LINEUP WEIGHT (APPROX): 6700.00 Lbs. (3039.12 Kg.)

PRODUCT ACCESSORIES:

Certified Test Report
Insulated Bus
Bottom Closing Plates
Two Piece Top Plates

CSA certification

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# F51085249–000010–01	PG 3 OF 3 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--	–	----	--	--/--/--
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1A 300A
CB-U7301-3
U-030-P-3
UV INFLUENT PUMP 3

2A 300A
CB-U7301-1
U-010-P-1
UV INFLUENT PUMP 1

3A POWER METER
PM-U7301

4A 1200A MAIN1
CB-U7301.MCB
MAIN BREAKER

5A 1200A TIE
CB-U7401-T
TIE BREAKER

6A 1200A MAIN2
CB-U7401.MCB
MAIN BREAKER

3G 50A AC DRIVE 20
CB-U6001
EF-U6001
EXHAUST FAN

1I EQUIPPED SPACE

2I 300A
CB-U7301-2
U-020-P-2
UV INFLUENT PUMP 2

1M EQUIPPED SPACE

4M 30A
SPD – 120kA

6M 30A
SPD – 120kA

1Q EQUIPPED SPACE

2Q EQUIPPED SPACE

3R 15A
CB-U7301-4
SPARE

4Q 15A
CB-U11011
XV-U11011
CHANNEL 1 GATE

6Q 15A
CB-U5002
OH-U5002
OVERHEAD HOIST CHANNEL 2

4S 15A
CB-U13011
XV-U13011
CHANNEL 3 GATE

6S 15A
CB-U6020
UH-U6010
7.5KW UNIT HEATER

1U EQUIPPED SPACE

2U EQUIPPED SPACE

3T 15A
CB-U5003
OH-U5003
OVERHEAD HOIST CHANNEL 3

4U 15A
CB-U6010
UH-U6010
7.5KW UNIT HEATER

10kW

6U 15A
CB-U5050
OD-U5050
UV STORAGE OVERHEAD DOOR

10kW

3V EQUIPPED SPACE

4W 15A
CB-U5001
OH-U5001
OVERHEAD HOIST CHANNEL 1

6W 15A
CB-U12011
XV-U12011
CHANNEL 2 GATE

3X EQUIPPED 3IN SPACE

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7301 MCC-U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ONE LINE DIAGRAM
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# 051085249-000010-01	PG 1 OF 2 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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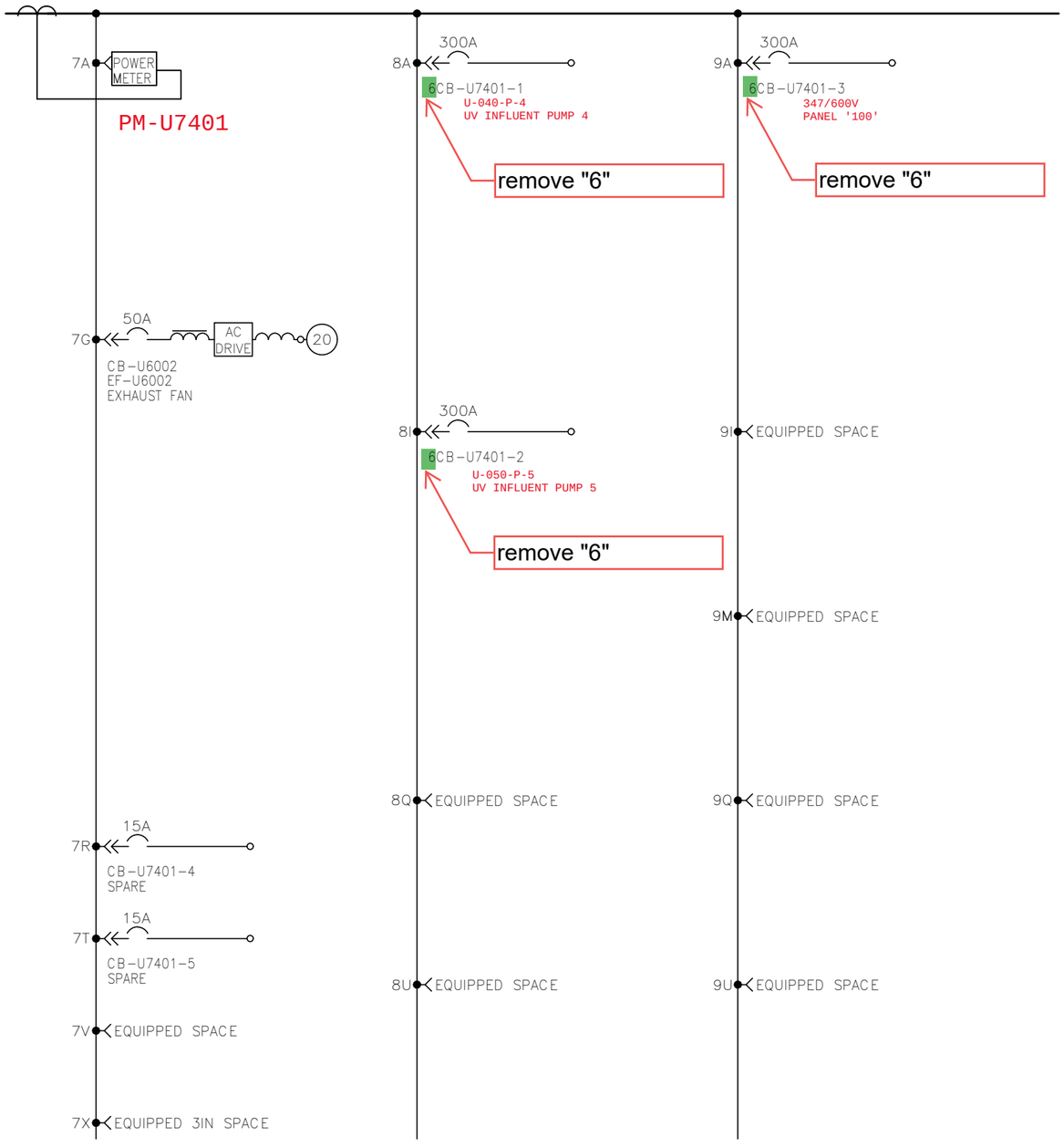

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ONE LINE DIAGRAM
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# 051085249–000010–01	PG 2 OF 2 REV –

REV	DESCRIPTION	BY	DATE																
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UNIT LOC	UNIT NAMEPLATES (WHITE SURFACE/BLACK LETTERS)	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: LED 30 mm ** ON LIGHT	PILOT DEVICES: LED 30 mm ** OFF LIGHT	PILOT DEVICES: LED 30 mm ** ADDL P/L	PILOT DEVICES: LED 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
1A	CB–U7301–3 U-030-P-3 UV INFLUENT PUMP 3	BRANCH BKR			LL 400	300											(2) 2/0–500KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249–000010–01
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, LSI TRIP FUNCTION, Screw Down Comp. ID Labels	
1I		12" SPACE																
1M		12" SPACE																
1Q		12" SPACE																
1U		12" SPACE																
2A	CB–U7301–1 U-010-P-1 UV INFLUENT PUMP 1	BRANCH BKR			LL 400	300											(2) 2/0–500KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249–000010–01
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, LSI TRIP FUNCTION, Screw Down Comp. ID Labels	
UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI	SEC	NO	NC	ON LIGHT	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
									FUSE SIZE		INTERLOCKS		PILOT DEVICES: LED 30 mm **					

MCC NAMEPLATE – (WHITE SURFACE/BLACK LETTERS)

MCC–U7301
MCC–U7401

NOTE: 2ND NAMEPLATE

On opposite sides of the MCC

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249–000010–01 PG 1 OF 8 REV –

REV	DESCRIPTION	BY	DATE										
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UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: LED 30 mm ** ON LIGHT	PILOT DEVICES: LED 30 mm ** OFF LIGHT	PILOT DEVICES: LED 30 mm ** ADDL P/L	PILOT DEVICES: LED 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
2I	CB–U7301–2 U-020-P-2 UV INFLUENT PUMP 2	BRANCH BKR			LL 400	300											(2) 2/0–500KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249–000010–01
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, LSI TRIP FUNCTION, Screw Down Comp. ID Labels	
2Q		12" SPACE																
2U		12" SPACE																
3A	MONITORING UNIT FOR MAIN PM-U7301	POWER METER															HEAT SHRINK WIRE LABELS, PM8244 W/DISPLAY, RING TONGUE TERMINALS, Screw Down Comp. ID Labels,(2) 460R600,	E51085249–000010–04
																	MTS TEST SWITCH	
3G	CB–U6001 EF–U6001 EXHAUST FAN	ATV630	D15	20	HL 150	50	CONTROL TRANSFORMER	100	.50	1.00			GREEN PTT	RED PTT	FAULT YELLOW PTT	HOA SS SPD POT	#16 AWG MTW CONTROL WIRE, 3% LINE REACTOR, ETHERNET TCP COMM, HEAT SHRINK WIRE LABELS, OUTPUT FILTER, RING TONGUE TERMINALS,	E51085249–000010–02
																	Screw Down Comp. ID Labels, T/M BKR, THERMOSTAT	
3O	ASD OUTPUT FILTER FOR CB–U6001 EF–U6001	MOTOR PROTECT FILTER															Screw Down Comp. ID Labels	E51085249–000010–02

UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: LED 30 mm ** ON LIGHT	PILOT DEVICES: LED 30 mm ** OFF LIGHT	PILOT DEVICES: LED 30 mm ** ADDL P/L	PILOT DEVICES: LED 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249–000010–01

REV	DESCRIPTION	BY	DATE										
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UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: LED 30 mm ** ON LIGHT	PILOT DEVICES: LED 30 mm ** OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
3R	CB-U7301-4 SPARE	6" BRANCH BKR			HL 150	15											(1) 14-3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249-000010-03
3T	CB-U5003 OH-U5003 OVERHEAD HOIST CHANNEL 3	6" BRANCH BKR			HL 150	15											(1) 14-3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249-000010-03
3V		6" SPACE																
3X		3" SPACE																
4A	CB-U7301.MCB MAIN BREAKER	MAIN1 BKR			PK 1200	1200											(4) 3/0-500KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249-000010-04
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, KEY INTERLOCK, LSIG TRIP FUNCTION, RING TONGUE TERMINALS,	
																	Screw Down Comp. ID Labels, 3 CT's, BENDER ZSCT IN PULLBOX	
																	CTUB102-CTBC120	
4M	SURGE PROTECTION DEVICE	SPD	120kA		HLL 100	30											Screw Down Comp. ID Labels, SOLIDLY GROUNDED, SURGE COUNTER	E51085249-000010-05
4Q	CB-U11011 XV-U11011 CHANNEL 1 GATE	6" BRANCH BKR			HL 150	15											(1) 14-3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249-000010-03

UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI	SEC	NO	NC	ON LIGHT	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
									FUSE SIZE		INTERLOCKS		PILOT DEVICES: LED 30 mm **					

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7301 MCC-U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249-000010-01

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: LED 30 mm ** ON LIGHT	PILOT DEVICES: LED 30 mm ** OFF LIGHT	PILOT DEVICES: LED 30 mm ** ADDL P/L	PILOT DEVICES: LED 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
4S	CB–U13011 XV–U13011 CHANNEL 3 GATE	6" BRANCH BKR			HL 150	15											(1) 14–3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249–000010–03
4U	CB–U6010 UH–U6010 7.5KW UNIT HEATER	6" BRANCH BKR			HL 150	15											(1) 14–3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249–000010–03
	10kW																	
4W	CB–U5001 OH–U5001 OVERHEAD HOIST CHANNEL 1	6" BRANCH BKR			HL 150	15											(1) 14–3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249–000010–03
5A		TIE BKR			PK 1200	1200											24VDC TRIP UNIT PWR SUPP, 80% RATED, ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, KEY INTERLOCK,	E51085249–000010–06
																	LSIG TRIP FUNCTION, RING TONGUE TERMINALS, Screw Down Comp. ID Labels	
6A	CB–7401.MCB MAIN BREAKER	MAIN2 BKR			PK 1200	1200											(4) 3/0–500KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249–000010–07
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, KEY INTERLOCK, LSIG TRIP FUNCTION, RING TONGUE TERMINALS,	
																	Screw Down Comp. ID Labels, 3 CT's, BENDER ZSCT in PULLBOX	
																CTUB102-CTBC120		
UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI	SEC	NO	NC	ON LIGHT	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
									FUSE SIZE		INTERLOCKS		PILOT DEVICES: LED 30 mm **					

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249–000010–01

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: LED 30 mm ** ON LIGHT	PILOT DEVICES: LED 30 mm ** OFF LIGHT	PILOT DEVICES: LED 30 mm ** ADDL P/L	PILOT DEVICES: LED 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
6M	SURGE PROTECTION DEVICE	SPD	120kA		HLL 100	30											Screw Down Comp. ID Labels, SOLIDLY GROUNDED, SURGE COUNTER	E51085249-000010-08
6Q	CB-U5002 OH-U5002 OVERHEAD HOIST CHANNEL 2	6" BRANCH BKR			HL 150	15											(1) 14-3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249-000010-03
6S	CB-U6020 UH-U6010 7.5KW UNIT HEATER	6" BRANCH BKR			HL 150	15											(1) 14-3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249-000010-03
	10kW																	
6U	CB-U5050 OD-U5050 UV STORAGE OVERHEAD DOOR	6" BRANCH BKR			HL 150	15											(1) 14-3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249-000010-03
6W	CB-U12011 XV-U12011 CHANNEL 2 GATE	6" BRANCH BKR			HL 150	15											(1) 14-3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249-000010-03
7A	MONITORING UNIT FOR MAIN PM-U7401	POWER METER															HEAT SHRINK WIRE LABELS, PM8244 W/DISPLAY, RING TONGUE TERMINALS, Screw Down Comp. ID Labels, (2) 460R600,	E51085249-000010-07
																	MTS TEST SWITCH	
UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI	SEC	NO	NC	ON LIGHT	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
									FUSE SIZE		INTERLOCKS		PILOT DEVICES: LED 30 mm **					

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7301 MCC-U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249-000010-01

REV	DESCRIPTION	BY	DATE										
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UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: LED 30 mm ** ON LIGHT	PILOT DEVICES: LED 30 mm ** OFF LIGHT	PILOT DEVICES: LED 30 mm ** ADDL P/L	PILOT DEVICES: LED 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
7G	CB–U6002 EF–U6002 EXHAUST FAN	ATV630	D15	20	HL 150	50	CONTROL TRANSFORMER	100	.50	1.00			GREEN PTT	RED PTT	FAULT YELLOW PTT	HOA SS SPD POT	#16 AWG MTW CONTROL WIRE, 3% LINE REACTOR, ETHERNET TCP COMM, HEAT SHRINK WIRE LABELS, OUTPUT FILTER, RING TONGUE TERMINALS,	E51085249–000010–09
																	Screw Down Comp. ID Labels, T/M BKR, THERMOSTAT	
7O	ASD OUTPUT FILTER FOR CB–U6002 EF–U6002	MOTOR PROTECT FILTER															Screw Down Comp. ID Labels	E51085249–000010–09
7R	CB–U7401–4 SPARE	6" BRANCH BKR			HL 150	15											(1) 14–3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249–000010–03
7T	CB–U7401–5 SPARE	6" BRANCH BKR			HL 150	15											(1) 14–3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, T/M BKR	E51085249–000010–03
7V		6" SPACE																
7X		3" SPACE																
8A	6CB–U7401–1 U-040-P-4 UV INFLUENT PUMP 4	BRANCH BKR			LL 400	300											(2) 2/0–500KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249–000010–01
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, LSI TRIP FUNCTION, Screw Down Comp. ID Labels	
UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI	SEC	NO	NC	ON LIGHT	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
									FUSE SIZE		INTERLOCKS		PILOT DEVICES: LED 30 mm **					

remove "6"

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249–000010–01

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--	–	----	--	--/--/--

UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: LED 30 mm ** ON LIGHT	PILOT DEVICES: LED 30 mm ** OFF LIGHT	PILOT DEVICES: LED 30 mm ** ADDL P/L	PILOT DEVICES: LED 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
8I	6CB-U7401-2 U-050-P-5 UV INFLUENT PUMP 5	BRANCH BKR			LL 400	300											(2) 2/0-500KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249-000010-01
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, LSI TRIP FUNCTION, Screw Down Comp. ID Labels	
8Q		12" SPACE																
8U		12" SPACE																
9A	6CB-U7401-3 347/600V PANEL '100'	BRANCH BKR			LL 400	300											(2) 2/0-500KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249-000010-01
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, LSI TRIP FUNCTION, Screw Down Comp. ID Labels	
9I		12" SPACE																
9M		12" SPACE																
9Q		12" SPACE																

UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: LED 30 mm ** ON LIGHT	PILOT DEVICES: LED 30 mm ** OFF LIGHT	PILOT DEVICES: LED 30 mm ** ADDL P/L	PILOT DEVICES: LED 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7301 MCC-U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249-000010-01

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: LED 30 mm ** ON LIGHT	PILOT DEVICES: LED 30 mm ** OFF LIGHT	PILOT DEVICES: LED 30 mm ** ADDL P/L	PILOT DEVICES: LED 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
9U		12" SPACE																
UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI	SEC	NO	NC	ON LIGHT	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
									FUSE SIZE		INTERLOCKS		PILOT DEVICES: LED 30 mm **					

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249–000010–01

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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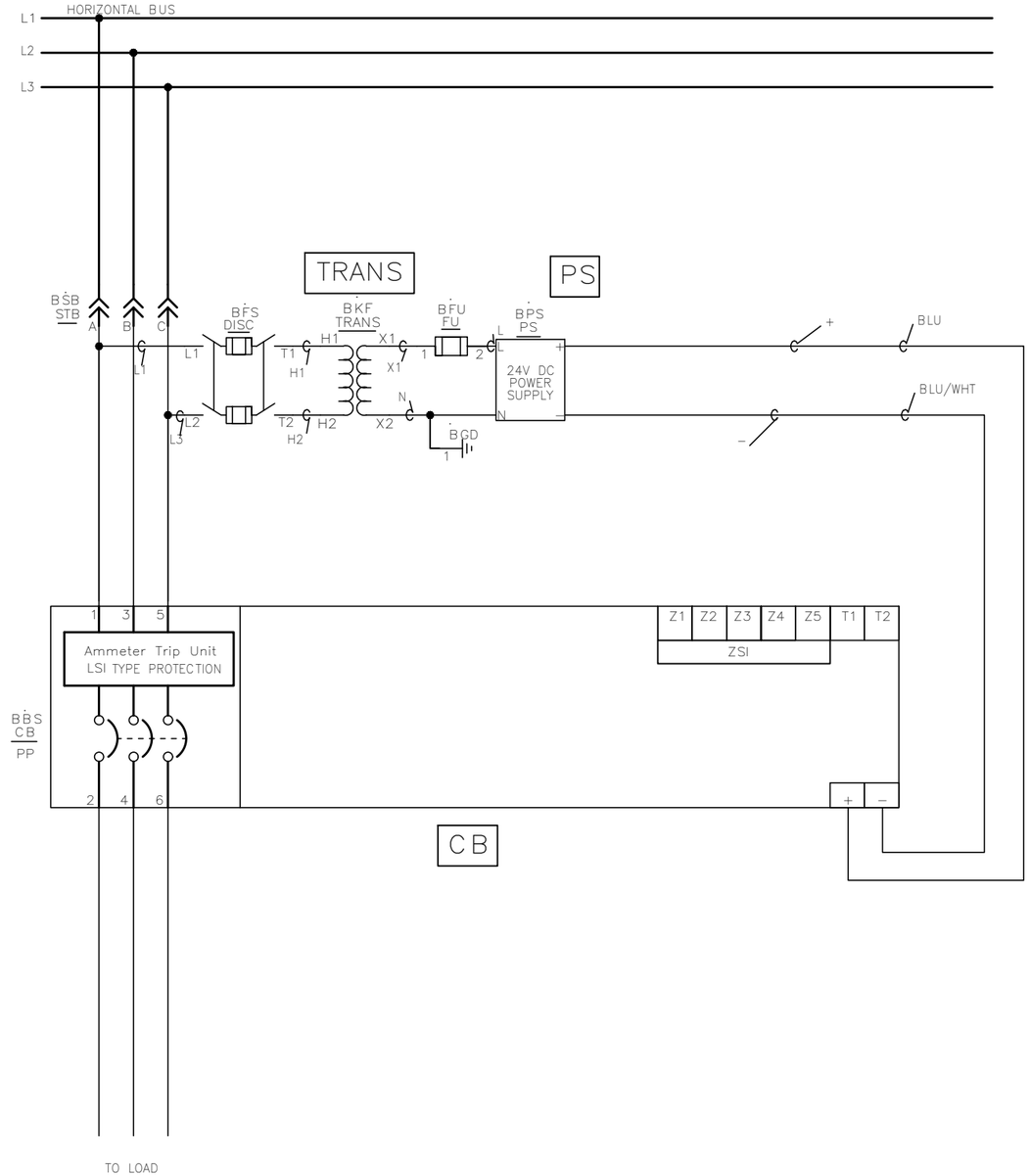
CIDL, HSWM, RTT



FUNCTION	CONNECTOR	DESCRIPTION
AUXILIARY CONTACTS	OF	OPEN/CLOSED CIRCUIT BKR POSITION CONTACTS
	SD	BELL ALARM
	SDE	OVERCURRENT SWITCH
REMOTE (TO BRKR) OPERATION	MN	UNDERVOLTAGE TRIP
	MX	SHUNT TRIP

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	E51085249-000010-01 PG 1 OF 1 REV –

CB

FLR

FOF

3G BBS CB

3G FLR LINE REACTOR

U1/A1 U2/A2
V1/B1 V2/B2
W1/C1 W2/C2

3G BFC 630 DRIVE

R/L1
S/L2
T/L3
GND

3O PTB

3O FOF LOAD FILTER

3O PTB

DS-U6001

MOTOR

JGB

HORIZ GND BUS

this mark up is only a suggestion. Adjust to no "Auto Start" as needed.

3G BAA GND

P24
OV
DI1 RUN FWD
DI2
DI3 CMD/REF SWITCHING
DI4
DI5
DI6
24V

3G BCR RCR

3G BAR AMR

3G FTB

DS-U6001

DI1
DI3
DI4

STOA
STOB
24V2

GN3

MODBUS RJ45 (DISPLAY-VP12S)

ETHERNET RJ45

Modbus control while in remote.

L1 L2

BLK BLK

H1 HF

600V

3G BAB TRANS

120V X2

XF

3G BAA GND

R1A
R1B
R1C
R2A
R2C
R3A
R3C

AFC TRIP SIGNAL (SHOWN IN TRIP MODE)

AFC RUN SIGNAL (SHOWN NOT RUNNING)

GN2
10V
AI1
COM
AI2
AI3
CM2 COM
AQ1
AQ2

BARE
RED
WHT
BLK

3G GAC MSP

SPEED POT

RED

3G FTB X1

3G FTB X2

BTH TH

108

3G LF1 FAN

X1

X2

3G FTB 17

3G BTR TCR

3G FTB 19

CUSTOMER FAULT (NC)

3G FTB 20

3G BRR DRR

3G FTB 21

CUSTOMER RUN (NO)

VFD

3G FTB (S3)

3G FTB (S2)

3G FTB (S1)

EXTERNAL SPEED REFERENCE 4-20mA DC SIGNAL (INPUT Z=250 ohm)

GRN

WHT

3G FTB (S6)

3G FTB (S5)

3G FTB (S4)

OUTPUT SPEED 4-20mA DC SIGNAL (INPUT Z=500 ohm)

Remote

control through modbus communication

Remove "Auto Start" rung, there is no Auto DO relay

3G GAB SS OFF HAND AUTO

USER SUPPLIED SHUTDOWN INTERLOCK

REMOVE JUMPER IF USED

3G FTB 1

3G FTB 2

XOO

3G FTB 3

3G FTB 4

AUTO START

101

100

102

RCR

RUN COMMAND RELAY

AMR

AUTO MODE RELAY

3G BTC TRIP

R1C R1B

103

TCR

TRIP RELAY

3G BTR TCR 10 6

104

3G DAA TRIP

L1 L2

3G BFC RUNNING

R2C R2A

105

DRR

RUN RELAY

3G BRR DRR 10 6

106

3G GAA RUN

3G BRR DRR 9 1

107

3G DAA STOPPED

SHUTDOWN INTERLOCK (REMOVE JUMPER IF USED)

SPARE 120VAC CONNECT

USER SUPPLIED AUTO START

FAULT (NO)

FAULT (NC)

RUN (NO)

EXT SPD REF 4-20mA DC SIGNAL (INPUT Z=250ohm)

OUTPUT SPD 4-20mA DC SIGNAL (INPUT Z=500ohm)

X1 X2 1 2 3 4 5 6 17 18 19 20 21 . S1 S2 S3 S4 S5 S6

DRIVE UNIT USER CONNECTIONS

CIDL, HSWM, RTT

DRIVE CATALOG NUMBER ATV630D15S6X

JOB NAME: CITY OF WINNIPEG NEWPCC UV UPGRADES - AE

JOB LOCATION: WINNIPEG, MB

DRAWN BY: CAD

ENGR: MWH

DATE: JANUARY 16, 2025

DRAWING STATUS: APPROVAL

EQUIPMENT DESIGNATION: MCC-U7301 MCC-U7401

EQUIPMENT TYPE: MODEL 6 MOTOR CONTROL CENTER

DRAWING TYPE: ELEMENTARY

SQUARE D by Schneider Electric

DWG# E51085249-000010-02

PG1 OF2

REV -

REV | DESCRIPTION | BY | DATE

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--

ATV630 FACTORY CONFIGURATION – NORMAL DUTY – HOA						
MENU	TAB	SUB–MENU	DESCRIPTION	SETTING	CODE	ADJ.
1	S.START	----	2/3 WIRE CONTROL	2C	TCC	2C
1	S.START	----	BASIC FREQUENCY	60Hz NEMA	BFR	60
1	S.START	----	MAX FREQUENCY	60	TFR	60
1	S.START	----	LOW SPEED	3	LSP	3
1	S.START	----	ACCELERATION	10	ACC	10
1	S.START	----	DECELERATION	10	DEC	10
5.2	---	SWITCHING FREQUENCY	SWITCHING FREQUENCY	2.5	SFR	2.5
5.5	---	----	REF FREQ 1 CONFIG	AI1	FR1	AI1
5.5	---	----	FREQ SWITCH ASSIGN	DI3	RFC	DI3
5.5	---	----	2–WIRE TYPE	LEVEL	TCT	LEL
5.5	---	----	REF FREQ 2 CONFIG	AI3	FR2	AI3
5.5	---	CONTROL MODE	CONTROL MODE	CONTROL MODE I/O PROFILE	CHCF	IO
5.5	---	COMMAND SWITCHING	COMMAND SWITCHING	DI3	CCS	DI3
5.5	---	CMD CHANNEL 1	CMD CHANNEL 1	TERMINAL	CD1	TER
5.5	---	CMD CHANNEL 2	CMD CHANNEL 2	TERMINAL	CD2	TER
5.11	AI/AQ	AI3 CONFIGURATION	AI3 MIN VALUE	4	CLR3	4
5.11	AI/AQ	AQ1 CONFIGURATION	AQ1 ASSIGNMENT	MOTOR FREQUENCY	AO1	OFR
5.11	AI/AQ	AQ1 CONFIGURATION	AQ1 MIN OUTPUT	4	AOL1	4
5.11	RELAY	R1 CONFIGURATION	R1 ASSIGNMENT	OPERATING STATE	R1	FLT
5.11	RELAY	R2 CONFIGURATION	R2 ASSIGNMENT	DRIVE RUNNING	R2	RUN
5.12	---	CATCH ON THE FLY	CATCH ON THE FLY	YES	FLR	YES

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249–000010–02	PG 2 OF 2 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
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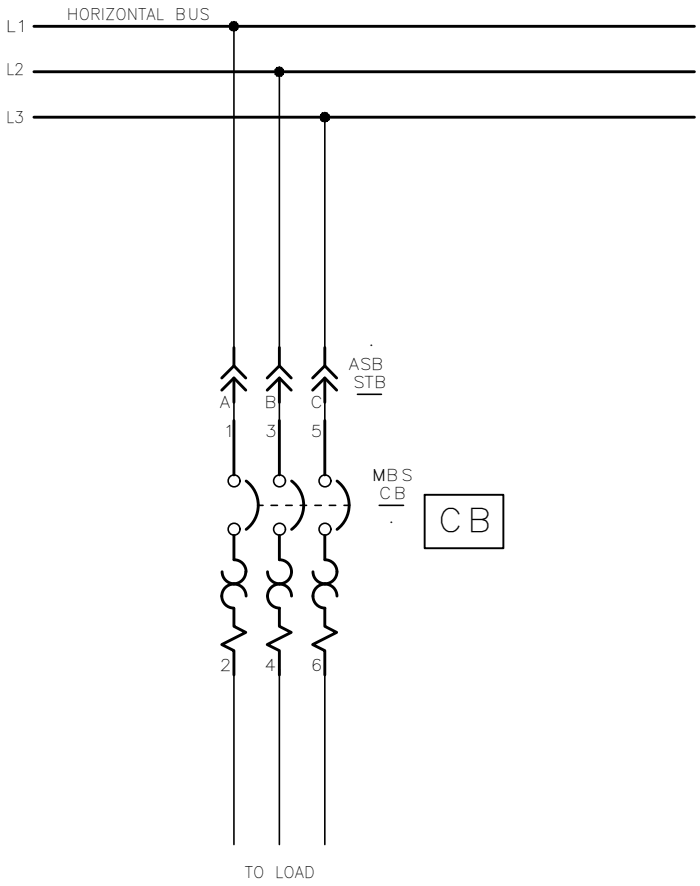
CIDL



JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249-000010-03	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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UNIT 4A

L1
L2
L3
HORIZONTAL BUS

INCOMING POWER
L1 L2 L3

BENDER CT IN PULLBOX

K
I

4A BFS DISC
L1 L2 T1 T2

BSTB SH–TB1
K
I
BAA 1

CTUB102
GND
+
GND

H1 H2
TRANS
X1 X2
4A BKF TRANS

4A BFU FU
2

4A BGD
1

L N
PS
24V DC POWER SUPPLY
+ –
4A BPS PS

BLU
BLU/WHT
+
–

FTB
L1 L2
LL1 LL2
TO UNIT 3A

1 3 5
Ammeter Trip Unit
LSIG TYPE PROTECTION
A TYPE UL RATING PLUG
2 4 6

Z1 Z2 Z3 Z4 Z5 M1 M2 T1 M3 T2 T3 T4 F1– F2+
ZSI
MDGF

4A BBS CB PP
K

SHUNT TRIP
MX MN
X
Y

CB

4A BCT CT
H H H
C1 C2 C3
2 4 6

4A BSTB SH–TB
A B C N
A B C N
4A JGB
1

TO UNIT 3A

FUNCTION	CONNECTOR	DESCRIPTION
AUXILIARY CONTACTS	OF	OPEN/CLOSED CIRCUIT BKR POSITION CONTACTS
	SD	BELL ALARM
	SDE	OVERCURRENT SWITCH
REMOTE (TO BRKR) OPERATION	MN	UNDERVOLTAGE TRIP
	MX	SHUNT TRIP

UNIT 3A

TO UNIT 4A
LL1 LL2
FTB
LL1 LL2

L3 L2 L1
1 3 5
3A BPF FU1
2 4 6
102 101 100

PT1
H1 H2
600:120V
X1 X2
3A BPA PT1

PT2
H2 H1
X2 X1
3A BPA PT2

103 104
1 3
3A BPF FU2
2 4

DAA MTS
V1A V2A V3A
(A) (B) (C) (D) (E) (F) (G) (H) (I) (J)
N A B C
TO UNIT 4A
MTS TEST BLOCK 210–J

V1 V2 V3
BAA 1

1 V1
2 V2
3 V3
5 Vn
60 D1+
61 D1–
DIGITAL OUTPUTS
40 S1+
41 S1–
42 S2+
43 S2–
44 S3+
45 S3–
DIGITAL INPUTS

3A BPM
POWERLOGIC ™
POWER METER
8244

AA BB CC NN
10 I1+
11 I1–
12 I2+
13 I2–
14 I3+
15 I3–
16 I4+
17 I4–

DISPLAY PORT
RJ45
DISPLAY
RS–485 + – C
22 23 24 25

PWMTR

L1 L2
8 9

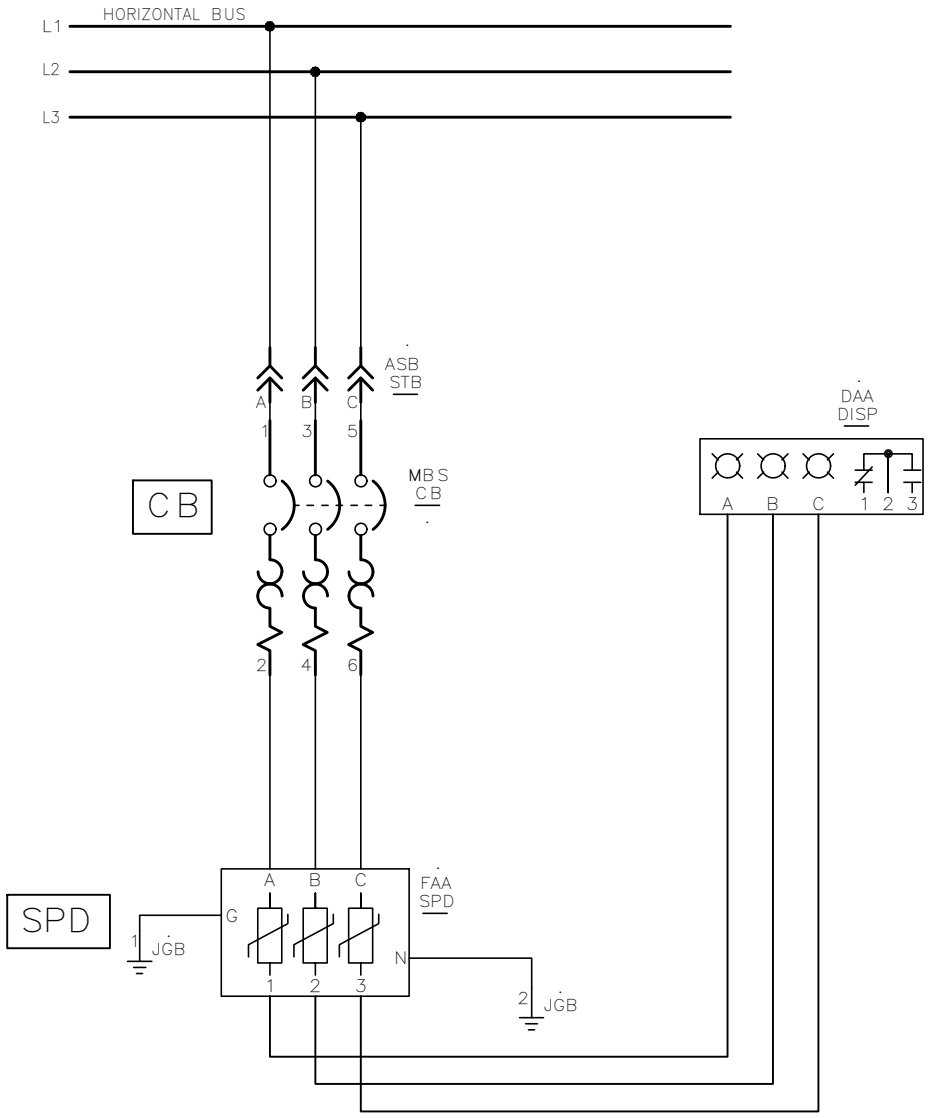
TRANS
H1 H2
600
120
X1 X2
X1A
3A BAB TRANS
3A BAA
3A BPF FU3
3A BPF FU4

INSTALLER NOTE:
IF THE METERING UNIT IS MOUNTED IN A SEPARATE SHIPPING SPLIT THAN THE MAIN THEN THE CT CONNECTIONS ARE ROLLED UP IN THE METERING UNIT AND THE CT SHORTING BLOCK IS LEFT SHORTED FOR SHIPPING PURPOSES. INSTALLER IS TO RECONNECT CT WIRING AND REMOVE CT SHORTING JUMPERS AT TERMINAL BLOCK BEFORE ENERGIZING MCC.

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249–000010–04	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--

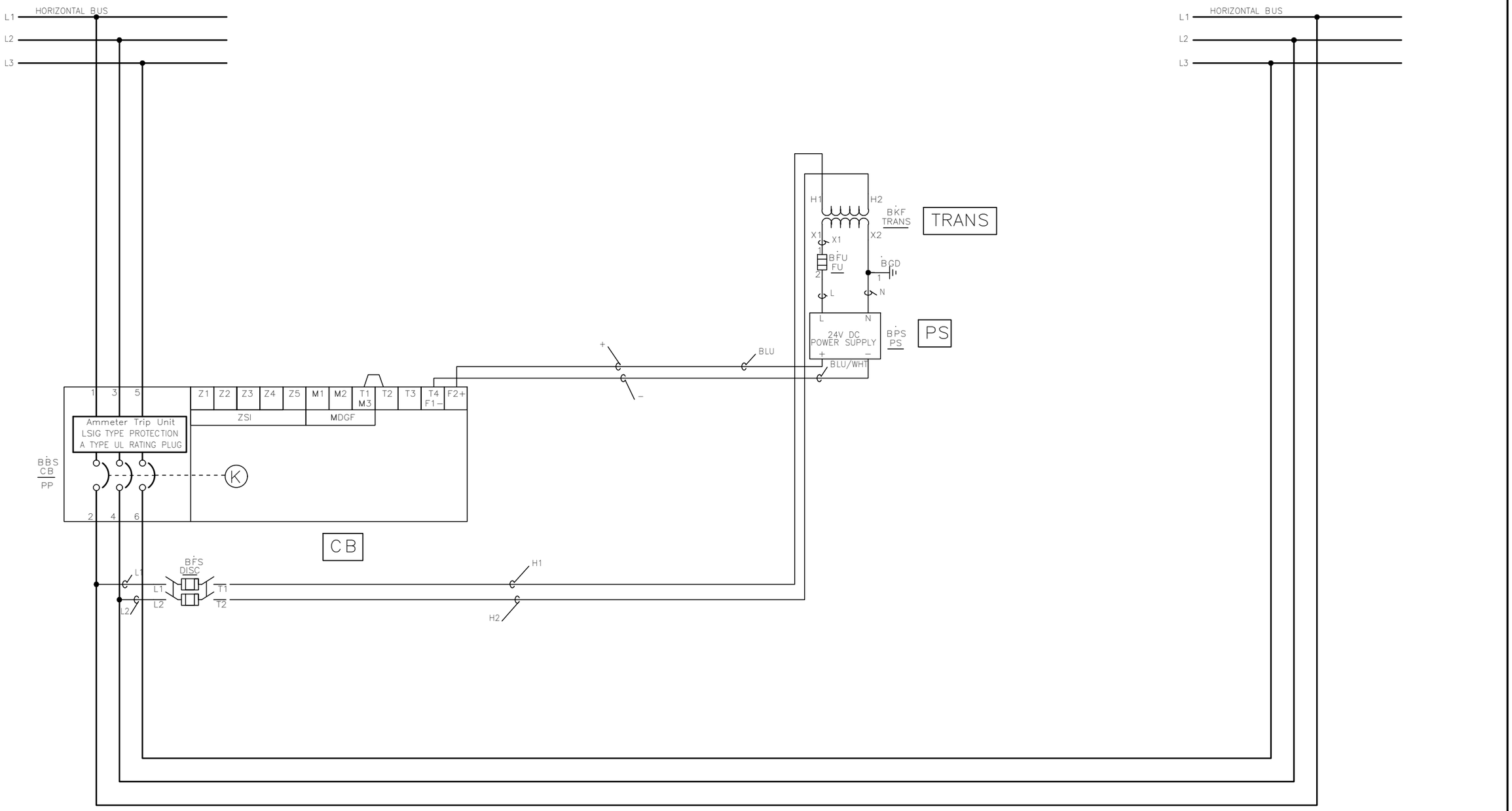
CIDL, HSWM



JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249–000010–05	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--	–	----	--	--/--/--

CIDL, HSWM



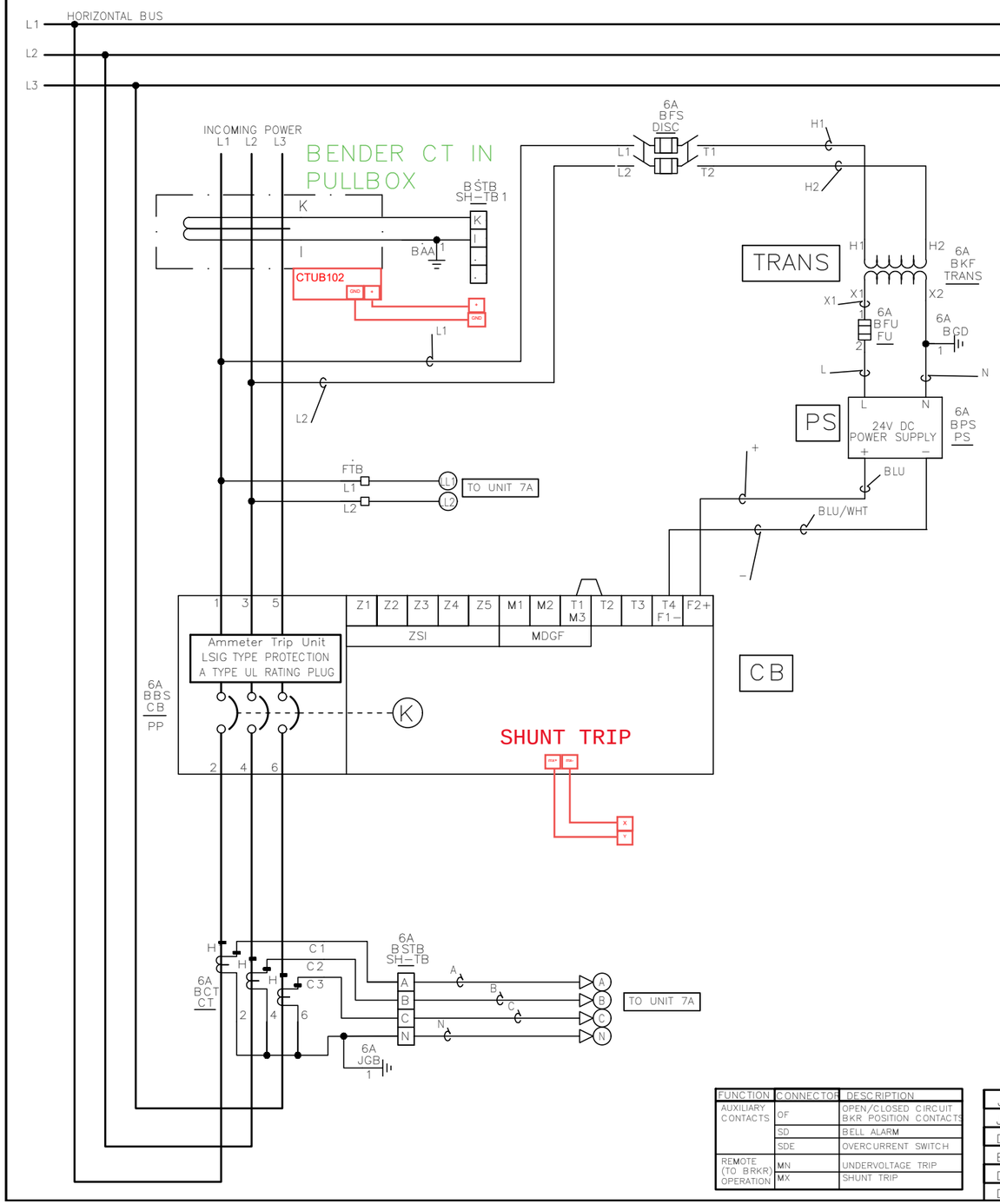
FUNCTION	CONNECTOR	DESCRIPTION
AUXILIARY CONTACTS	OF	OPEN/CLOSED CIRCUIT BKR POSITION CONTACTS
	SD	BELL ALARM
	SDE	OVERCURRENT SWITCH
REMOTE (TO BRKR) OPERATION	MN	UNDERVOLTAGE TRIP
	MX	SHUNT TRIP

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249-000010-06	PG 1 OF 1 REV –

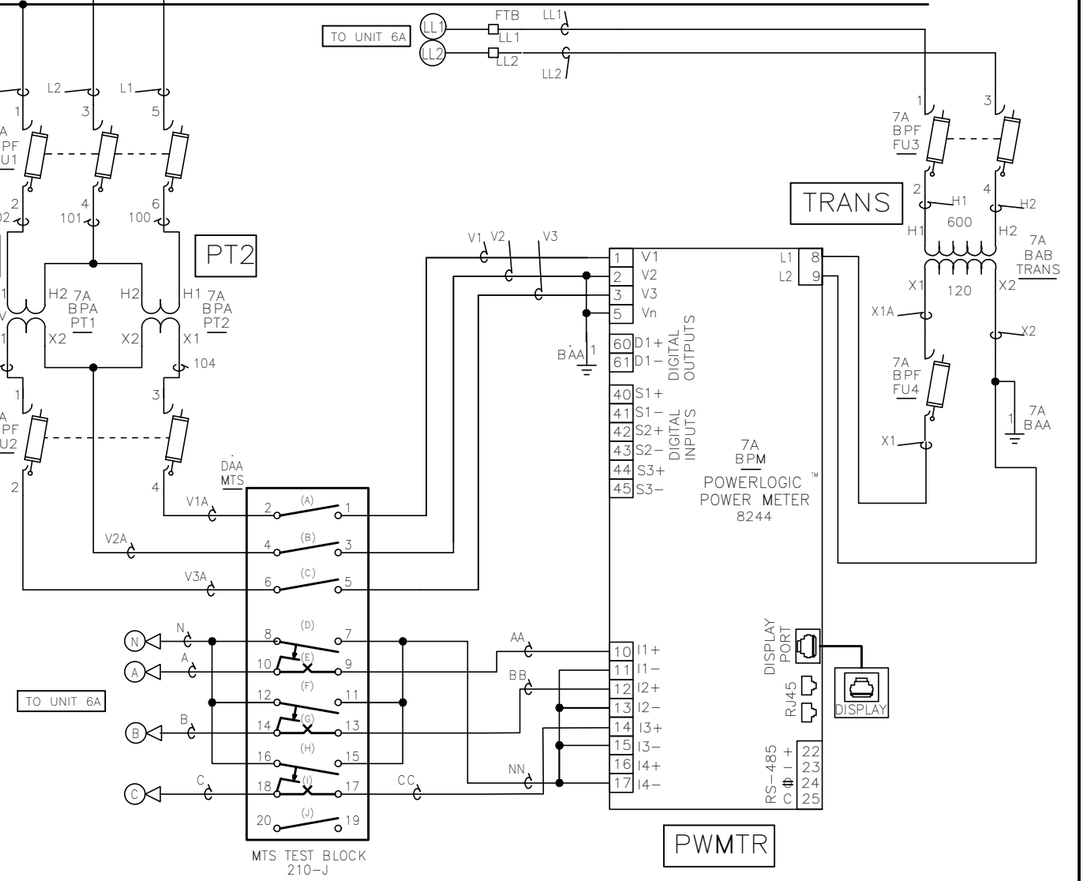
REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--	–	----	--	--/--/--				

CIDL, HSWM, RTT

UNIT 6A



UNIT 7A



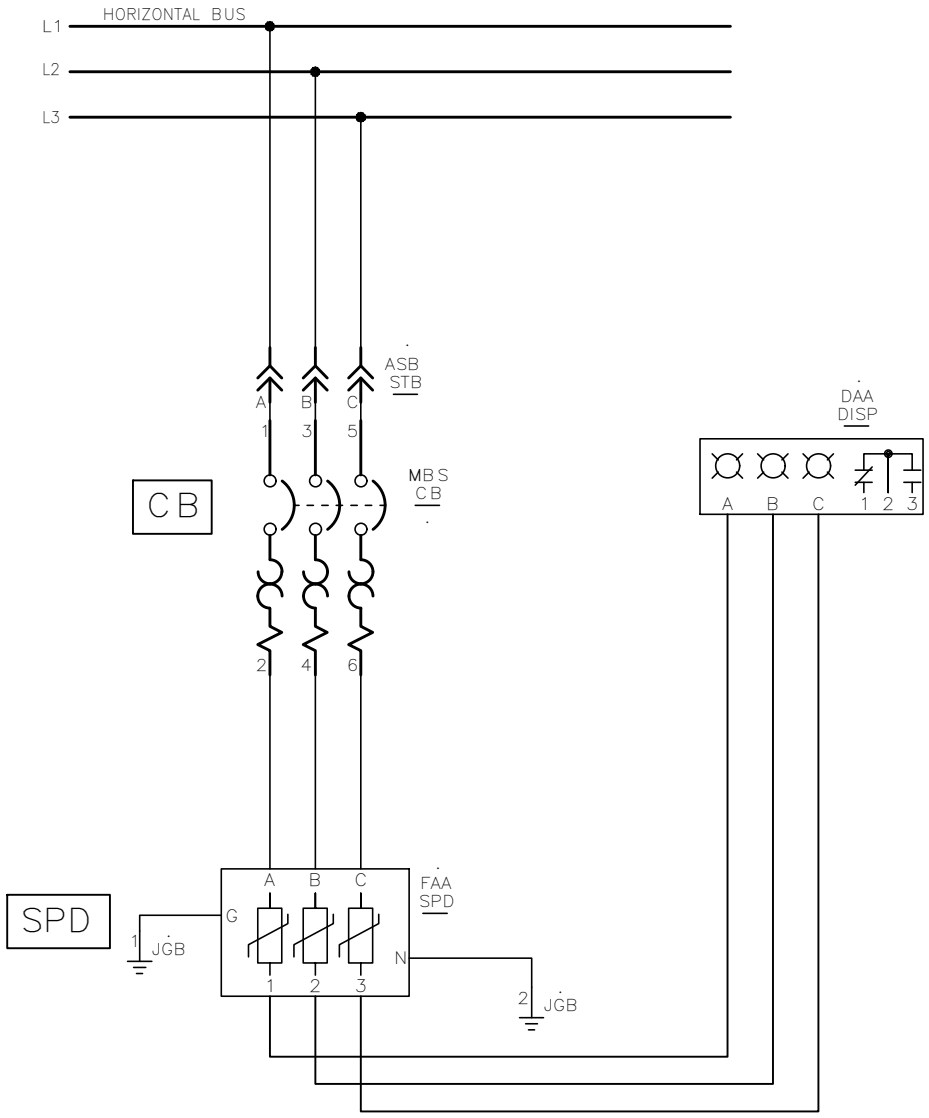
FUNCTION	CONNECTOR	DESCRIPTION
AUXILIARY CONTACTS	OF	OPEN/CLOSED CIRCUIT BKR POSITION CONTACTS
	SD	BELL ALARM
	SDE	OVERCURRENT SWITCH
REMOTE (TO BRKR) OPERATION	MN	UNDERVOLTAGE TRIP
	MX	SHUNT TRIP

INSTALLER NOTE:
IF THE METERING UNIT IS MOUNTED IN A SEPARATE SHIPPING SPLIT THAN THE MAIN THEN THE CT CONNECTIONS ARE ROLLED UP IN THE METERING UNIT AND THE CT SHORTING BLOCK IS LEFT SHORTED FOR SHIPPING PURPOSES. INSTALLER IS TO RECONNECT CT WIRING AND REMOVE CT SHORTING JUMPERS AT TERMINAL BLOCK BEFORE ENERGIZING MCC.

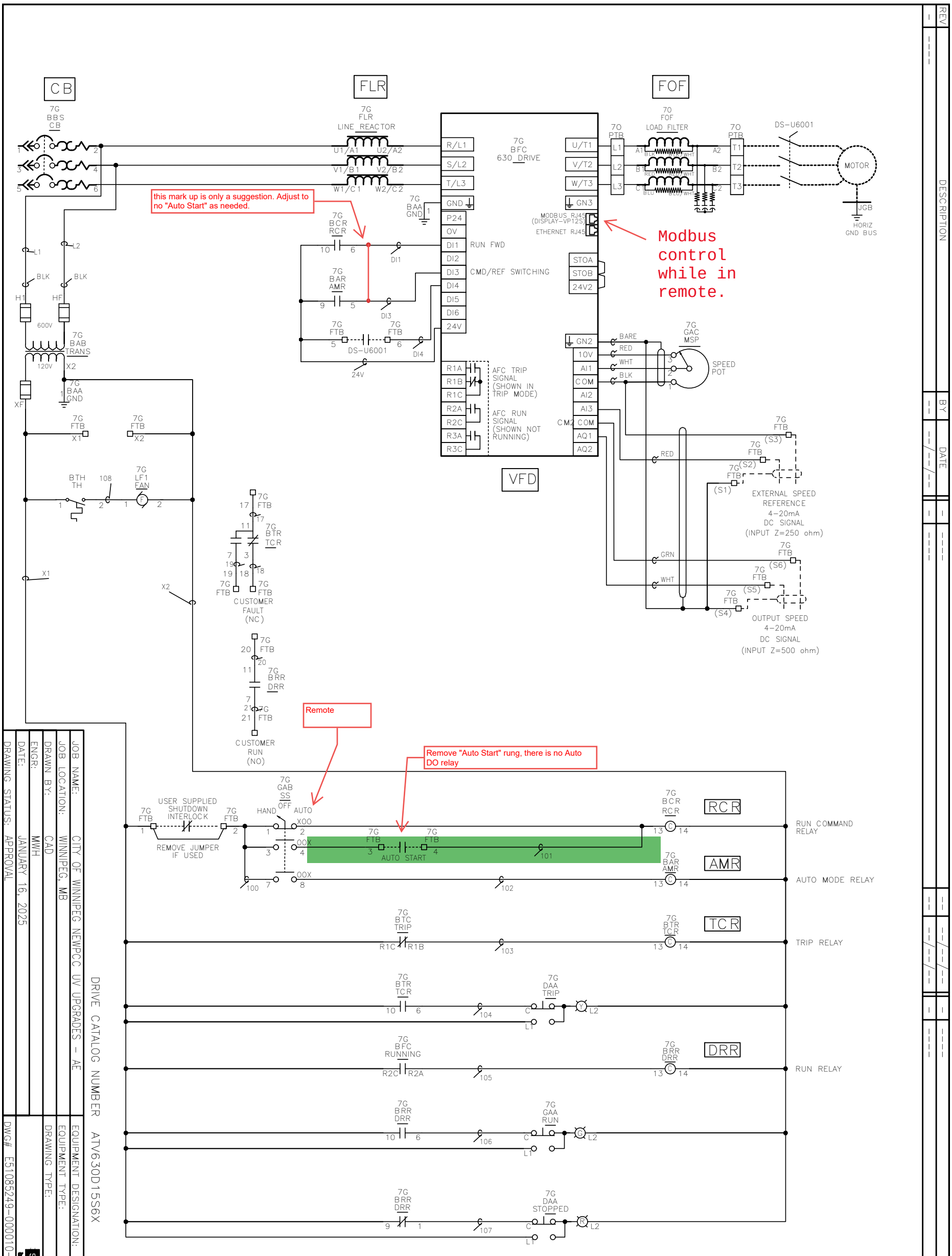
JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249–000010–07	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--

CIDL, HSWM



JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249–000010–08	PG 1 OF 1 REV –


CB
FLR
FOF
7G BBS CB
7G FLR LINE REACTOR
U1/A1 U2/A2
V1/B1 V2/B2
W1/C1 W2/C2
7G BFC 630 DRIVE
7O PTB
7O FOF LOAD FILTER
DS-U6001
MOTOR
JGB
HORIZ GND BUS
this mark up is only a suggestion. Adjust to no "Auto Start" as needed.
Modbus control while in remote.
MODBUS RJ45 (DISPLAY-VP12S)
ETHERNET RJ45
R/L1
S/L2
T/L3
GND
P24
0V
DI1
DI2
DI3
DI4
DI5
DI6
24V
RUN FWD
CMD/REF SWITCHING
U/T1
V/T2
W/T3
GN3
STOA
STOB
24V2
7G BCR RCR
7G BAR AMR
7G FTB
DS-U6001
7G BAA GND
7G GAC MSP
SPEED POT
BARE
RED
WHT
BLK
10V
AI1
COM
AI2
AI3
CM2
AQ1
AQ2
R1A
R1B
R1C
R2A
R2C
R3A
R3C
AFC TRIP SIGNAL (SHOWN IN TRIP MODE)
AFC RUN SIGNAL (SHOWN NOT RUNNING)
VFD
H1
HF
600V
120V
X2
XF
X1
BTH TH
108
7G LF1 FAN
7G BTR TCR
CUSTOMER FAULT (NC)
7G BRR DRR
CUSTOMER RUN (NO)
GRN
(S1)
(S2)
(S3)
(S4)
(S5)
(S6)
EXTERNAL SPEED REFERENCE 4-20mA DC SIGNAL (INPUT Z=250 ohm)
OUTPUT SPEED 4-20mA DC SIGNAL (INPUT Z=500 ohm)
Remote
Remove "Auto Start" rung, there is no Auto DO relay
7G GAB SS
HAND
AUTO
OFF
USER SUPPLIED SHUTDOWN INTERLOCK
REMOVE JUMPER IF USED
AUTO START
RCR
RUN COMMAND RELAY
AMR
AUTO MODE RELAY
7G BTC TRIP
TCR
TRIP RELAY
7G BTR TCR
7G DAA TRIP
7G BFC RUNNING
DRR
RUN RELAY
7G BRR DRR
7G GAA RUN
7G DAA STOPPED
SHUTDOWN INTERLOCK (REMOVE JUMPER IF USED)
SPARE 120VAC CONNECT
USER SUPPLIED AUTO START
FAULT (NO)
FAULT (NC)
RUN (NO)
EXT SPD REF 4-20mA DC SIGNAL (INPUT Z= 250ohm)
OUTPUT SPD 4-20mA DC SIGNAL (INPUT Z= 500ohm)
X1 X2 1 2 3 4 5 6 17 18 19 20 21 . S1 S2 S3 S4 S5 S6
DRIVE UNIT USER CONNECTIONS
REV
DESCRIPTION
BY
DATE
JOB NAME: CITY OF WINNIPEG NEWPCC UV UPGRADES - AE
JOB LOCATION: WINNIPEG, MB
DRAWN BY: CAD
ENGR: MWH
DATE: JANUARY 16, 2025
DRAWING STATUS: APPROVAL
DRIVE CATALOG NUMBER ATV630D15S6X
EQUIPMENT DESIGNATION: MCC-U7301 MCC-U7401
EQUIPMENT TYPE: MODEL 6 MOTOR CONTROL CENTER
DRAWING TYPE: ELEMENTARY
DWG# E51085249-000010-09
PG1 OF2
REV -

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--

ATV630 FACTORY CONFIGURATION – NORMAL DUTY – HOA						
MENU	TAB	SUB–MENU	DESCRIPTION	SETTING	CODE	ADJ.
1	S.START	----	2/3 WIRE CONTROL	2C	TCC	2C
1	S.START	----	BASIC FREQUENCY	60Hz NEMA	BFR	60
1	S.START	----	MAX FREQUENCY	60	TFR	60
1	S.START	----	LOW SPEED	3	LSP	3
1	S.START	----	ACCELERATION	10	ACC	10
1	S.START	----	DECELERATION	10	DEC	10
5.2	---	SWITCHING FREQUENCY	SWITCHING FREQUENCY	2.5	SFR	2.5
5.5	---	----	REF FREQ 1 CONFIG	AI1	FR1	AI1
5.5	---	----	FREQ SWITCH ASSIGN	DI3	RFC	DI3
5.5	---	----	2–WIRE TYPE	LEVEL	TCT	LEL
5.5	---	----	REF FREQ 2 CONFIG	AI3	FR2	AI3
5.5	---	CONTROL MODE	CONTROL MODE	CONTROL MODE I/O PROFILE	CHCF	IO
5.5	---	COMMAND SWITCHING	COMMAND SWITCHING	DI3	CCS	DI3
5.5	---	CMD CHANNEL 1	CMD CHANNEL 1	TERMINAL	CD1	TER
5.5	---	CMD CHANNEL 2	CMD CHANNEL 2	TERMINAL	CD2	TER
5.11	AI/AQ	AI3 CONFIGURATION	AI3 MIN VALUE	4	CLR3	4
5.11	AI/AQ	AQ1 CONFIGURATION	AQ1 ASSIGNMENT	MOTOR FREQUENCY	AO1	OFR
5.11	AI/AQ	AQ1 CONFIGURATION	AQ1 MIN OUTPUT	4	AOL1	4
5.11	RELAY	R1 CONFIGURATION	R1 ASSIGNMENT	OPERATING STATE	R1	FLT
5.11	RELAY	R2 CONFIGURATION	R2 ASSIGNMENT	DRIVE RUNNING	R2	RUN
5.12	---	CATCH ON THE FLY	CATCH ON THE FLY	YES	FLR	YES

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7301 MCC–U7401
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249–000010–09	PG 2 OF 2 REV –

Schneider Electric

Project Name: City of Winnipeg NEWPCC UV Upgrades - AE
Primary Purchaser: 93473-EECOL ELECTRIC CORP

Order Number: 0051085249
Purchase Order Number: 601-27719
Document Date: 01/21/2025

ERP Line #	Qty	Product Description
000020	1	**Designation :** MCC-U7101 MCC-U7201 **Product Details:** Model 6 MCC - Industrial Package 1-Model 6 LVMCC-Model 6 MCC - Industrial Package --- Engineered To Order (ETO) --- POWER SYSTEM DATA: System Voltage: 480Y/277V 3PH 4W 60Hz System Source Type: 3 Phase Wye System Source Ground Point: Common Point Grounded Max Available Fault Current (RMS): 42kA BUS SYSTEM DATA: Power Bus: 1600A Tin Plated Copper Vertical Bus: 600A Tin Plated Copper Bus Bracing: 42kA Neutral Bus: 50 Percent Rated Tin Plated Copper Horizontal Ground Bus: 600A Tin Plated Copper Vertical Ground Bus: Tin Plated Copper ENCLOSURE DATA: Enclosure Type: 20" Deep Industrial Duty Type 12 Exterior Color: ANSI 49 Interior Color: White STRUCTURE FEATURES: Enclosure Rating: Arc Resistant per ANSI C37.20.7 for 100ms arc duration (Device Limited) when fed by approved Schneider Electric circuit breaker or fuses listed in Instruction manual 80459-641-01. Examples of devices which are required upstream of the MCC are Powerpact P or R-frame or MasterPact NW or NT circuit breakers or Class L fuses. Circuit Breaker settings must have instantaneous trip enabled and set to trip at 35,000 amperes or less. Equipment Mounting Height: 72" Premium Barrier System including wire trough barriers with fishtape plugs and section barriers Neutral Bus Optimum Drops per Lineup Steel Bottom Closure Plate Wire Tie Retainers in Vertical Wireway Insulated Bus Ground Bus Lugs Each End of Lineup Rodent Barriers Equipment Nameplate Engraved with White Surface/Black Letters COMMON DEVICE FEATURES: Control Power: 120Vac Wiring Type: Class 1 Type B Wiring Manual Vertical Bus Shutters Drawing Format: PDF - Single Multi Page File Unit Nameplate White Surface / Black Letters PRODUCT ACCESSORIES: Certified Test Report SPECIAL PRICING AND SECTION COUNT DATA: Lineup: 1 - TO BE MAIN-TIE-TIE-MAIN (TAG#: NOTE) Sections: 1 - 600A top ground bus where feasible (TAG#: SS12) Lineup: 1 - 2nd Master nameplate (TAG#: MCC)

Lineup: 1 - NO BUS SPLICE SECT 5-6, 7-8
(TAG#: NOTE)
12 - Total Section(s) in Lineup
4 - Section(s) with no Vertical Bus
8 - Section(s) with 600A Tin Plated Copper Vertical Bus

DIMENSIONS AND WEIGHT

Dimensions: 270.00"W X 20"D X 94.5"H
Approximate Weight: 8920.00 lbs / 4046.11 kgs

INCOMING

Incoming Connection Type: Cable
Entry Direction: Through the Bottom

should be top entry for all cables

MAIN

Main Breaker Bottom Entry 1600A
Aluminum Mechanical Lugs: (6) 1/0 - 750 kcmil Wires/Phase
Electronic Trip Circuit Breaker with Ground Fault
Electronic Trip Unit with Ammeter
Long-time + Short-time + Instantaneous + Ground Fault Protection
24Vdc Trip Unit Power Supply
Neutral Lug Termination
Key Interlock (Single Cylinder)
Component ID Labels: Scr Dwn White Surface/Blk Letters
Ring Tongue Terminal
Heat Shrink Customer Assigned Wire Markers
Device Height - 72 in
Power Meter PM8244 w/ Display, 4 Wire, 3 CTs
#14 AWG MTW Control Wire
Component ID Labels: Scr Dwn White Surface/Blk Letters
Ring Tongue Terminal
Heat Shrink Customer Assigned Wire Markers
Device Height - 6 in
(1) Provide 1200AS/1200AT Main breaker (TAG#: Engineering Note)
(1) MDGF for Top R frame part 1 (TAG#: TR-140789-3)
(1) 5 X 4C 500mcm per phase & neutral (TAG#: Note)

FEEDERS
---
12 - Circuit Breaker Branch Feeder 150A
100kA Interrupting Rating
Aluminum Mechanical Lugs: (1) 14 - 2/0 AWG Wire/Phase
3 - Circuit Breaker Branch Feeder 15A
100kA Interrupting Rating
Aluminum Mechanical Lugs: (1) 14 - 3/0 AWG Wire/Phase

COMMON FEEDER FEATURES

Neutral Lug Termination
Component ID Labels: Scr Dwn White Surface/Blk Letters
Device Height - 12 in

MISCELLANEOUS DEVICES
---
2 - 72" H x 20" W Special Unit
Omit Horizontal Bus
Component ID Labels: Scr Dwn White Surface/Blk Letters
Heat Shrink Customer Assigned Plastic

Sleeve Wire Markers
Device Height - 72 in
(1) INSTALL MDGF SENSORS (TAG#: NOTE)
(1) MDGF for Top R frame part 2 (TAG#: TR-140789-4)
CTAC120
(1) CTAC210 for R frame (TAG#: TR-140944-2)
(1) CT shorting terminal (TAG#: MCC)
2 - 18" Special Unit
Component ID Labels: Scr Dwn White Surface/Blk Letters
Heat Shrink Customer Assigned Plastic Sleeve Wire Markers
Device Height - 18 in
(1) (3) Type 460R PT's w/ Fuses (TAG#: MM11)
(1) Back-mount MTS 10 pole test sw (TAG#: TR-138569-1)
1 - Surge Protection Device
Solidly Grounded
120kA Surge Rating
Wye Connected Secondary Transformer - With Circuit Breaker Disconnect
SPD Surge Counter
Component ID Labels: Scr Dwn White Surface/Blk Letters
Device Height - 12 in
11 - 12" Prepared Space
2 - 9" Prepared Space
1 - 51" Special Unit
Component ID Labels: Scr Dwn White Surface/Blk Letters
Heat Shrink Customer Assigned Plastic Sleeve Wire Markers
Device Height - 51 in
(1) BOTTOM TIE BREAKER P FRAME 1200A/900ATT, 25" SECTION, N..C. (TAG#: MCC)
(1) Neutral Lug Termination (TAG#: MCC)
(1) LSIG trip unit (TAG#: MCC)
is this for ground fault trip
(1) 24Vdc Trip Unit Power Supply (TAG#: MCC)
(1) MDGF for tie breaker (TAG#: TR-140789-1)
(1) Kirk key (TAG#: MCC)
(1) ARC upgrade (TAG#: MCC)
(1) Wire ID Component ID labels (TAG#: MCC)
(1) Ring tongue (TAG#: MCC)
2 - 3" Configured Space
2 - 33" Special Unit
Component ID Labels: Scr Dwn White Surface/Blk Letters
Heat Shrink Customer Assigned Plastic Sleeve Wire Markers
Device Height - 33 in
(1) MDGF for P frame Tie part 2 (TAG#: TR-140789-2)
1 - 51" Special Unit
Component ID Labels: Scr Dwn White Surface/Blk Letters
Heat Shrink Customer Assigned Plastic Sleeve Wire Markers
Device Height - 51 in
(1) BOTTOM TIE BREAKER P FRAME 1200A/900AT, 25" SECTION, N..O. (TAG#: MCC)
(1) Neutral Lug Termination (TAG#: MCC)
(1) LSIG trip unit (TAG#: MCC)
(1) 24Vdc Trip Unit Power Supply (TAG#: MCC)
(1) MDGF for tie breaker (TAG#: TR-140789-1)
(1) Kirk key (TAG#: MCC)

(1) ARC upgrade (TAG#: MCC)
(1) Wire ID Component ID labels (TAG#: MCC)
(1) Ring tongue (TAG#: MCC)
1 - 6" Special Unit
Component ID Labels: Scr Dwn White Surface/Blk Letters
Heat Shrink Customer Assigned Plastic Sleeve Wire Markers
Device Height - 6 in
(1) PM8243 Meter (TAG#: MM11)
1 - 12" Special Unit
Component ID Labels: Scr Dwn White Surface/Blk Letters
Heat Shrink Customer Assigned Plastic Sleeve Wire Markers
Device Height - 12 in
(1) SURGE COUNTER (TAG#: 120KA SPD WITH BREAKER)
1 - 72" H x 25" W Special Unit
Component ID Labels: Scr Dwn White Surface/Blk Letters
Heat Shrink Customer Assigned Plastic Sleeve Wire Markers
Device Height - 72 in
(1) BOTTOM MAIN R FRAME MAIN BREAKER, 1200AS/1200AT (TAG#: MCC)
(1) Neutral Lug Termination (TAG#: MCC)
(1) 6.0A LSIG Trip unit (TAG#: MCC)
(1) 24Vdc Trip Unit Power Supply (TAG#: MCC)
(1) MDGF for main breaker (TAG#: TR140789-3)
(1) Kirk Key (TAG#: MCC)
(1) ARC upgrade (TAG#: MCC)
(1) Insulated buss, full section main (TAG#: MCC)
(1) Wire ID Component ID labels (TAG#: MCC)
(1) Ring tongue (TAG#: MCC)
(1) 5 X 4C 500mcm per phase & neutral (TAG#: Note)

SQUARE D
by Schneider Electric

Job Name:	City of Winnipeg NEWPCC UV Upgrades – AE	Square D Quotation #:	51085249
Job Location:	Winnipeg, MB	Quotation Revision #:	
		Sales Contact:	
		Sales Contact Location:	
Purchaser:	93473–EECOL ELECTRIC CORP	Customer:	WILL ADVISE ADDRESS
Purchaser PO #:		Customer PO #:	
User:		Architect:	
User Location:		Cons. Engineer:	0
Drawing Status:	APPROVAL		

TABLE OF CONTENTS

SQUARE D FACTORY ORDER NUMBER:51085249–000020

Equipment Designation	Equipment Type	Drawing Type	Drawing Number	Page	Revision Level
MCC–U7101 MCC–U7201	MODEL 6 MCC	ELEVATION	F51085249–000020–01	1	–
			F51085249–000020–01	2	–
			F51085249–000020–01	3	–
			F51085249–000020–01	4	–
			F51085249–000020–01	5	–
			F51085249–000020–01	6	–
		ONE LINE DIAGRAM	O51085249–000020–01	1	–
			O51085249–000020–01	2	–
		UNIT INFORMATION	I51085249–000020–01	1	–
			I51085249–000020–01	2	–
			I51085249–000020–01	3	–
			I51085249–000020–01	4	–
			I51085249–000020–01	5	–
		ELEMENTARY	E51085249–000020–01	1	–
			E51085249–000020–01	2	–
			E51085249–000020–02	1	–
			E51085249–000020–03	1	–
			E51085249–000020–04	1	–
			E51085249–000020–05	1	–
			E51085249–000020–05	2	–
			E51085249–000020–06	1	–
			E51085249–000020–07	1	–
			E51085249–000020–08	1	–

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
–	----	--	--/--/--	–	----	--	--/--/--	–	----	--	--/--/--

REMOVABLE LIFTING ANGLE
3.00
[76]

Note : No bus Splice connection between section 5 & 6 and 7 & 8

ARC GAS RELIEF REQUIRES MINIMUM OF 28.50/[724] FROM TOP AND 14.24/[362] FROM REAR TO THE FRONT OF STRUCTURE MUST BE FREE OF OBSTRUCTION

14.24
[362]

TYPICAL SECTION
TOP VIEW

add all tags for MCC and breakers

EACH LETTER EQUALS 3.00/[76] MOUNTING SPACE

90.00
[2286]

A B C D E F G H I J K L M N O P Q R S T U V W X

CABLE PULL SECTION 1A	MAIN BKR 2A	PWR MTR 3A SPECIAL UNIT 3C SPD 3I BR BKR 3M BR BKR 3Q BR BKR 3U	BR BKR 4A PREPARED SPACE 4E PREPARED SPACE 4I PREPARED SPACE 4M PREPARED SPACE 4Q PREPARED SPACE 4U	TIE BKR 5H	TIE LUGS 6N	TIE LUGS 7N	TIE BKR 8H	BR BKR 9A PREPARED SPACE 9E PREPARED SPACE 9I PREPARED SPACE 9M PREPARED SPACE 9Q PREPARED SPACE 9U	PWR MTR 10A SPECIAL UNIT 10C SPD 10I BR BKR 10M BR BKR 10Q BR BKR 10U	MAIN BKR 11A
		BR BKR 5A PREPARED SPACE 5E	BR BKR 6A BR BKR 6E BR BKR 6I C – SPACE 6M			BR BKR 7A BR BKR 7E PREPARED SPACE 7I C – SPACE 7M	BR BKR 8A PREPARED SPACE 8E			

1.50
[38]

	SECT 1	SECT 2	SECT 3	SECT 4	SECT 5	SECT 6	SECT 7	SECT 8	SECT 9	SECT 10	SECT 11
	20.00 [508]	25.00 [635]	20.00 [508]	20.00 [508]	25.00 [635]	25.00 [635]	25.00 [635]	25.00 [635]	25.00 [635]	20.00 [508]	25.00 [635]
	20.00 [508]	25.00 [635]	40.00 [1016]		25.00 [635]	50.00 [1270]		25.00 [635]	25.00 [635]	20.00 [508]	25.00 [635]
	SS # 1	SS # 2	SS # 3		SS # 4	SS # 5		SS # 6	SS # 7	SS # 8	SS # 9

275.00
[6985.00]

2.50
[64]

10.00 [254]	12.50 [318]	20.00 [508]	10.00 [254]	25.00 [635]	25.00 [635]	12.50 [318]	12.50 [318]	12.50 [318]	10.00 [254]	12.50 [318]

2.50
[64]

ANCHOR DETAIL

DUAL DIMENSIONS: INCHES
MILLIMETERS

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# F51085249-000020-01	PG 1 OF 6 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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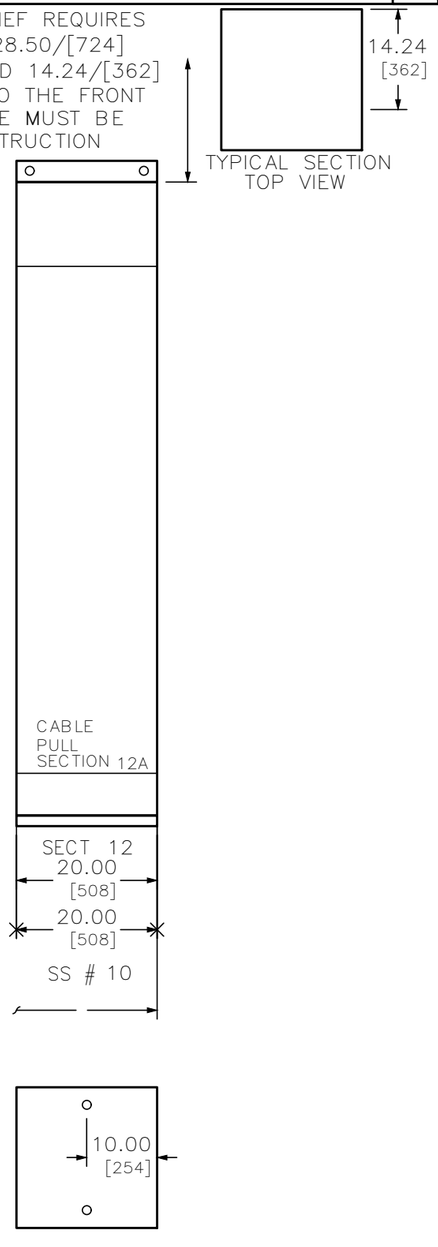
ARC GAS RELIEF REQUIRES MINIMUM OF 28.50/[724] FROM TOP AND 14.24/[362] FROM REAR TO THE FRONT OF STRUCTURE MUST BE FREE OF OBSTRUCTION



Note : No bus Splice connection between section 5 & 6

DUAL DIMENSIONS: INCHES
MILLIMETERS

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# F51085249-000020-01	PG 2 OF 6 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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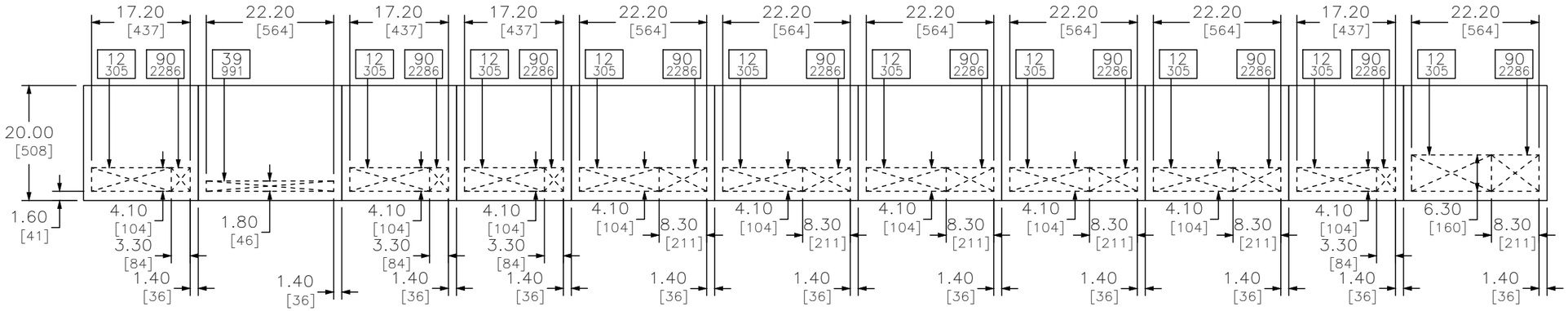
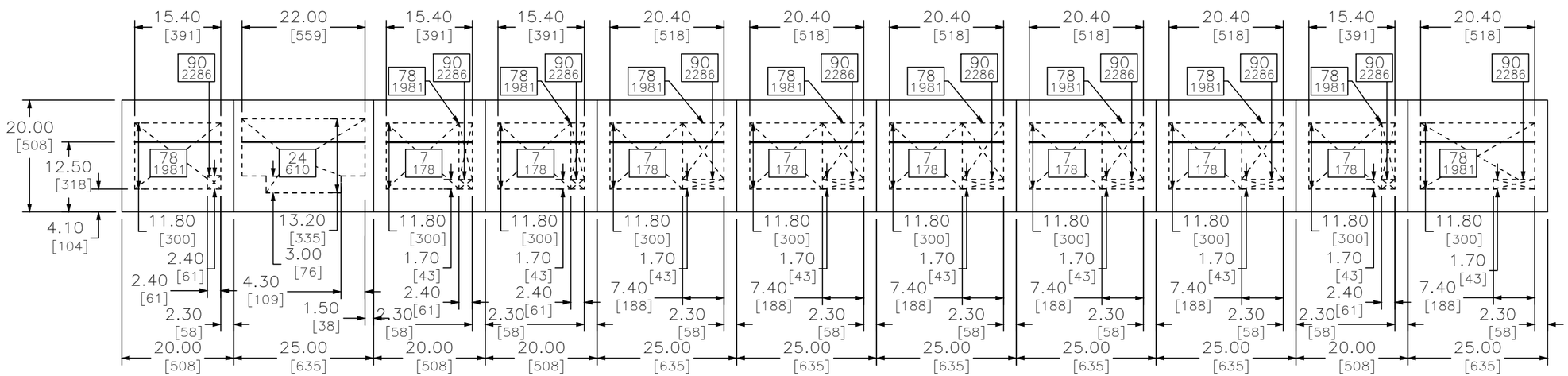


all load cables are top entry

TOP VIEW



DUAL DIMENSIONS: INCHES MILLIMETERS

FLOOR VIEW

CROSSED AREA REPRESENTS CONDUIT ENTRY AREA. NUMBERS IN BOXES INDICATE VERTICAL CLEARANCE TO NEAREST OBSTRUCTION.

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# F51085249-000020-01	PG 3 OF 6 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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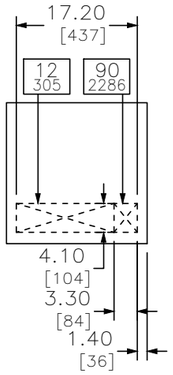

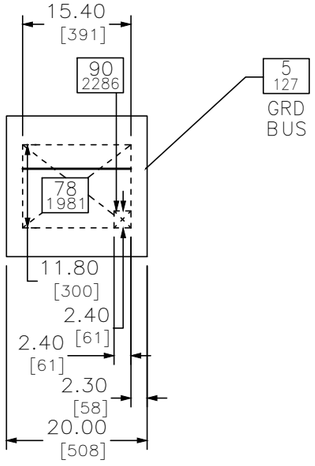

DUAL DIMENSIONS: INCHES
MILLIMETERS

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# F51085249-000020-01	PG 4 OF 6 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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GENERAL NOTES

Class 1 Type B Wiring

PRODUCT DESCRIPTION AND RATINGS

POWER SYSTEM DATA:

480Y/277V 3PH 4W 60Hz
POWER SYSTEM GROUND POINT: Common Point Grounded
SHORT CIRCUIT RATING: 42kA
POWER ENTERS: Main Breaker Bottom Section 2
CONTROL POWER: 120Vac

Top fed only

BUS SYSTEM DATA:

MAIN HORIZONTAL BUS: 1600 Amp Tin Plated Copper
BUS BRACING: 42kA
VERTICAL BUS: 600 Amp Tin Plated Copper
NEUTRAL BUS: 1200 Amp Tin Plated Copper
HORIZONTAL GROUND BUS: 600 Amp Tin Plated Copper
Units Securely Grounded To Structure

ENCLOSURE DATA:

ENCLOSURE TYPE: 20" DEEP Type 12
EXTERIOR COLOR: Electrodeposition Finish ANSI 49 Medium Light Grey
INTERIOR COLOR: Electrodeposition Finish White
REMOVABLE 3" [76mm] LIFTING ANGLE

STRUCTURE MODIFICATIONS:

Ground Bus Lugs 1,12
Rodent Barriers 1,12
Manual Bus Shutters 3,4,5,6,7,8,9,10
Premium Barrier System 3,4,5,6,7,8,9,10
600A Vertical Bus 3,4,5,6,7,8,9,10
Copper Vertical Ground Bus 3,4,5,6,7,8,9,10
Wire Retainers 3,4,5,6,7,8,9,10
Equipment Nameplate 1
Neutral Bus Drop 3,4,5,6,7,8,9,10
Omit Horizontal Bus 1,12
Top Ground Bus 3,4,9,10

EQUIPMENT WEIGHT:

SHIPPING SPLIT # 1: 700.00 Lbs. (317.52 Kg.)
SHIPPING SPLIT # 2: 720.00 Lbs. (326.59 Kg.)
SHIPPING SPLIT # 3: 1500.00 Lbs. (680.40 Kg.)
SHIPPING SPLIT # 4: 770.00 Lbs. (349.27 Kg.)
SHIPPING SPLIT # 5: 1540.00 Lbs. (698.54 Kg.)
SHIPPING SPLIT # 6: 770.00 Lbs. (349.27 Kg.)
SHIPPING SPLIT # 7: 770.00 Lbs. (349.27 Kg.)
SHIPPING SPLIT # 8: 750.00 Lbs. (340.20 Kg.)
SHIPPING SPLIT # 9: 720.00 Lbs. (326.59 Kg.)
SHIPPING SPLIT # 10: 700.00 Lbs. (317.52 Kg.)

(Continued on next page)

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7101 MCC-U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# F51085249-000020-01	PG 5 OF 6 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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TOTAL LINEUP WEIGHT (APPROX): 8940.00 Lbs. (4046.11 Kg.)

GENERAL NOTES CONTINUED

PRODUCT ACCESSORIES:

Certified Test Report
Insulated Bus
Arc Resistant (Passive–Reinforced Construction): Device Limited (100ms duration)
Upstream OCPD must be an approved Schneider Electric circuit breaker or fuses per Instruction manual 80459–641–01
If circuit breaker is the upstream OCPD it must have it's instantaneous trip turned ON and set for 35,000 amperes or less and it's short time delay must be turned OFF.
Bottom Closing Plates

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# F51085249–000020–01	PG 6 OF 6 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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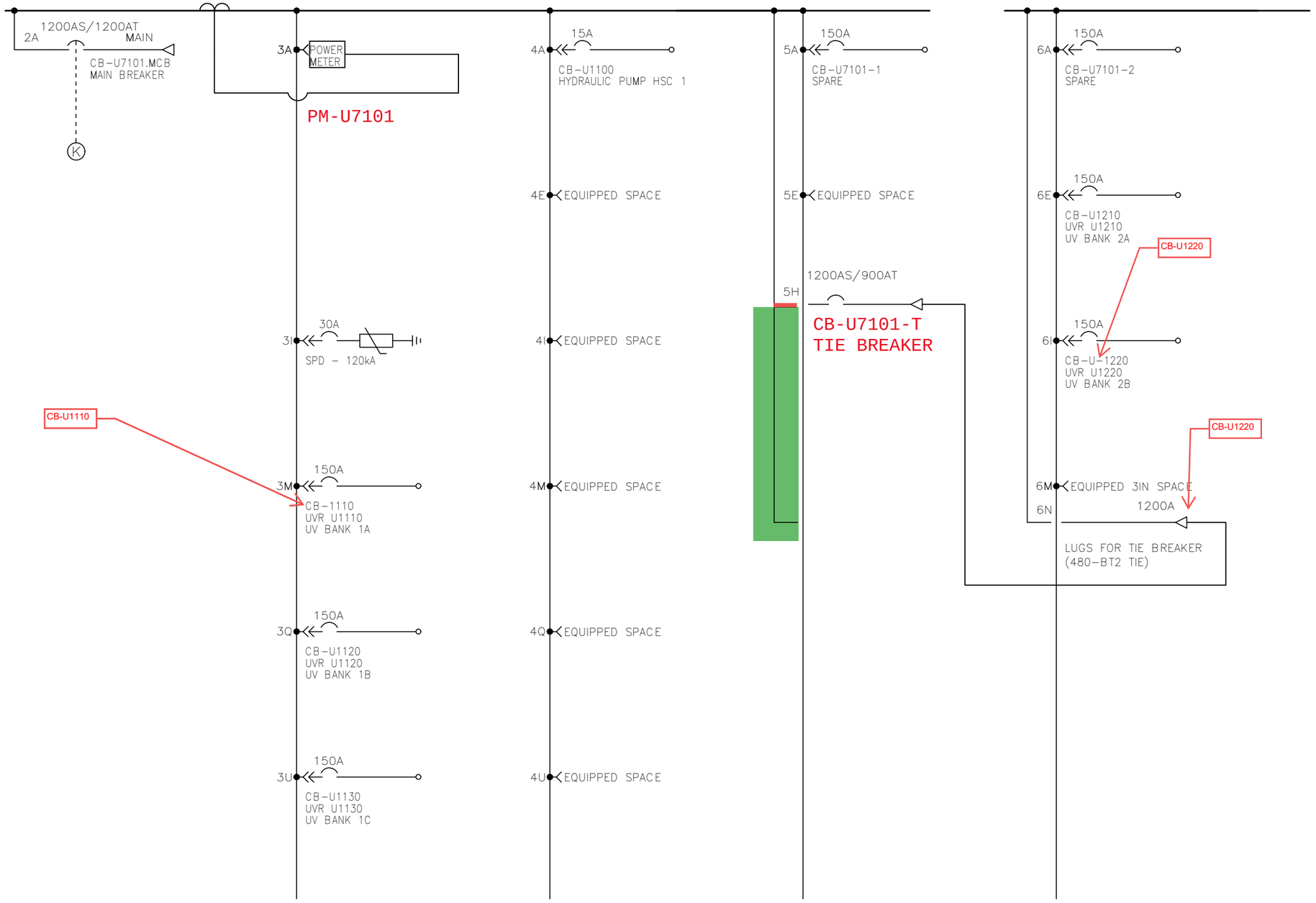

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7101 MCC-U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ONE LINE DIAGRAM
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# 051085249-000020-01	PG 1 OF 2 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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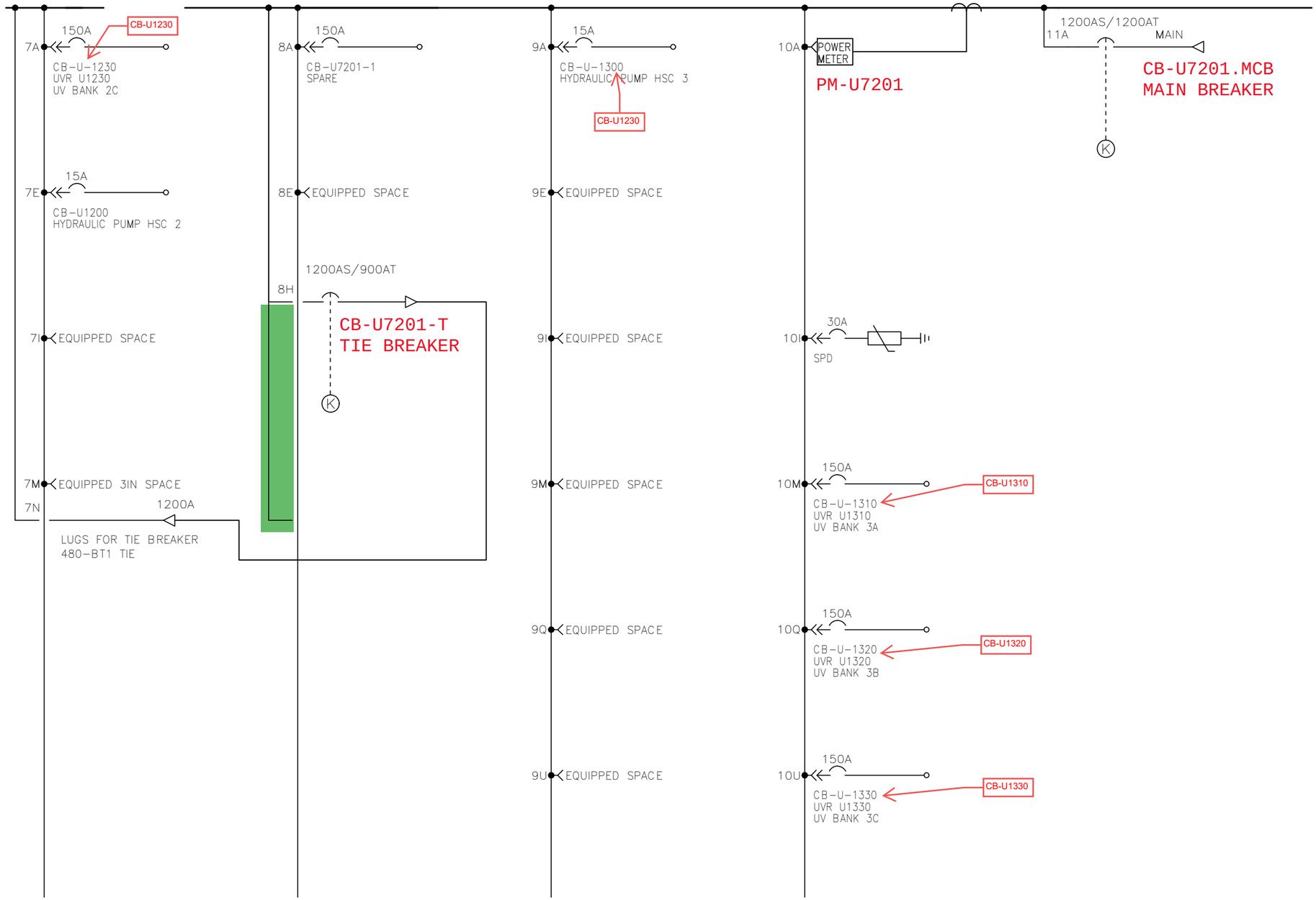

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7101 MCC-U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ONE LINE DIAGRAM
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# 051085249-000020-01	PG 2 OF 2 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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UNIT LOC	UNIT NAMEPLATES (WHITE SURFACE/BLACK LETTERS)	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: 30 mm ** ON LIGHT	PILOT DEVICES: 30 mm ** OFF LIGHT	PILOT DEVICES: 30 mm ** ADDL P/L	PILOT DEVICES: 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
1A	PULL CABLE SECTION	72" SPECIAL UNIT															Screw Down Comp. ID Labels, Cable pull section, CTAC210 ZERO SEQUENCE CT	E51085249-000020-01
2A	CB-U7101.MCB MAIN BREAKER	MAIN BKR			RK 3000	1200											(6) 1/0-750KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249-000020-01
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, KEY INTERLOCK, LSIG TRIP FUNCTION, RING TONGUE TERMINALS,	
																	Screw Down Comp. ID Labels, SOLID NEUTRAL, 3 CT's, LV848891SP MDGF MODULE, (4) S33579 MDGF CURRENT SENSORS	
3A	MONITORING UNIT FOR MAIN PM-U7101	POWER METER															HEAT SHRINK WIRE LABELS, PM8244 W/DISPLAY, RING TONGUE TERMINALS, Screw Down Comp. ID Labels	E51085249-000020-01
3C	METER	18" SPECIAL UNIT															Screw Down Comp. ID Labels, (3) 460R288, MTS TEST BLOCK 210-J-B	E51085249-000020-01
3I	SURGE PROTECTION DEVICE	SPD	120kA		HLL 100	30											Screw Down Comp. ID Labels, SOLIDLY GROUNDED, SURGE COUNTER	E51085249-000020-02
3M	CB-1110 UVR U1110 UV BANK 1A	BRANCH BKR			HL 150	150											(1) 14-2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249-000020-03
																	T/M BKR	
3Q	CB-U1120 UVR U1120 UV BANK 1B	BRANCH BKR			HL 150	150											(1) 14-2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249-000020-03
																	T/M BKR	
UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: 30 mm ** ON LIGHT	PILOT DEVICES: 30 mm ** OFF LIGHT	PILOT DEVICES: 30 mm ** ADDL P/L	PILOT DEVICES: 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #

CTAC120

CB-U1110

MCC NAMEPLATE – (WHITE SURFACE/BLACK LETTERS)

NOTE: 2ND NAMEPLATE

MCC-U7101
MCC-U7201

On opposite sides of the MCC

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7101 MCC-U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249-000020-01 PG 1 OF 5 REV –

REV	DESCRIPTION	BY	DATE
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UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: 30 mm ** ON LIGHT	PILOT DEVICES: 30 mm ** OFF LIGHT	PILOT DEVICES: 30 mm ** ADDL P/L	PILOT DEVICES: 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
3U	CB–U1130 UVR U1130 UV BANK 1C	BRANCH BKR			HL 150	150											(1) 14–2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249–000020–03
																	T/M BKR	
4A	CB–U1100 HYDRAULIC PUMP HSC 1	BRANCH BKR			HL 150	15											(1) 14–3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249–000020–04
																	T/M BKR	
4E		12" SPACE																
4I		12" SPACE																
4M		12" SPACE																
4Q		12" SPACE																
4U		12" SPACE																
5A	CB–U7101–1 SPARE	BRANCH BKR			HL 150	150											(1) 14–2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249–000020–03
																	T/M BKR	
5E		9" SPACE																
5H	CB–U7101–T TIE BREAKER	TIE BKR			PL 1200	900											(4) 3/0–500KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249–000020–06
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, LSIG TRIP FUNCTION, RING TONGUE TERMINALS,	
																	SCREW DOWN COMP. ID LABELS, SOLID NEUTRAL,	
6A	CB–U7101–2 SPARE	BRANCH BKR			HL 150	150											(1) 14–2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249–000020–03
																	T/M BKR	

UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: 30 mm ** ON LIGHT	PILOT DEVICES: 30 mm ** OFF LIGHT	PILOT DEVICES: 30 mm ** ADDL P/L	PILOT DEVICES: 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249–000020–01

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: 30 mm ** ON LIGHT	PILOT DEVICES: 30 mm ** OFF LIGHT	PILOT DEVICES: 30 mm ** ADDL P/L	PILOT DEVICES: 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
6E	CB-U1210 UVR U1210 UV BANK 2A	BRANCH BKR			HL 150	150											(1) 14-2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249-000020-03
																	T/M BKR	
	CB-U1220																	
6I	CB-U-1220 UVR U1220 UV BANK 2B	BRANCH BKR			HL 150	150											(1) 14-2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249-000020-03
																	T/M BKR	
6M		3" SPACE																
6N	MAIN LUGS FOR TIE BREAKER	MAIN LUGS															(4) 1/0-500KCMIL WIRES/PH, AL MECH LUG AL/CU CABLE, SOLID NEUTRAL	E51085249-000020-06
	CB-U1230																	
7A	CB-U-1230 UVR U1230 UV BANK 2C	BRANCH BKR			HL 150	150											(1) 14-2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249-000020-03
																	T/M BKR	
7E	CB-U1200 HYDRAULIC PUMP HSC 2	BRANCH BKR			HL 150	15											(1) 14-3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249-000020-04
																	T/M BKR	
7I		12" SPACE																
7M		3" SPACE																
7N	MAIN LUGS FOR TIE BREAKER	MAIN LUGS															(4) 1/0-500KCMIL WIRES/PH, AL MECH LUG AL/CU CABLE, SOLID NEUTRAL	E51085249-000020-07
UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI	SEC	NO	NC	ON LIGHT	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
									FUSE SIZE		INTERLOCKS		PILOT DEVICES: 30 mm **					

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7101 MCC-U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249-000020-01 PG 3 OF 5 REV –

REV	DESCRIPTION	BY	DATE																
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UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: 30 mm ** ON LIGHT	PILOT DEVICES: 30 mm ** OFF LIGHT	PILOT DEVICES: 30 mm ** ADDL P/L	PILOT DEVICES: 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
8A	CB–U7201–1 SPARE	BRANCH BKR			HL 150	150											(1) 14–2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249–000020–03
																	T/M BKR	
8E		9" SPACE																
8H	CB-U7201-T TIE BREAKER	TIE BKR			PL 1200	900											(4) 3/0–500KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249–000020–07
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, LSIG TRIP FUNCTION, RING TONGUE TERMINALS,	
	CB-U1300																SCREW DOWN COMP. ID LABELS, SOLID NEUTRAL, LV848891SP MDGF MODULE, (4) S33579 MDGF CURRENT SENSORS	
9A	CB–U–1300 HYDRAULIC PUMP HSC 3	BRANCH BKR			HL 150	15											(1) 14–3/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249–000020–04
																	T/M BKR	
9E		12" SPACE																
9I		12" SPACE																
9M	no lower case letters on nameplate	12" SPACE																
9Q		12" SPACE																
9U		12" SPACE																
10A	PM-U7201	POWER METER															HEAT SHRINK WIRE LABELS, PM8244 W/DISPLAY, RING TONGUE TERMINALS, Screw Down Comp. ID Labels	E51085249–000050–01
10C	METER	18" SPECIAL UNIT															Screw Down Comp. ID Labels, (3) 460R288, MTS TEST BLOCK 210–J–B	E51085249–000050–01
10I	SPD	SPD	120kA		HLL 100	30											Screw Down Comp. ID Labels, SOLIDLY GROUNDED, SURGE COUNTER	E51085249–000020–08
UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI	SEC	NO	NC	ON LIGHT	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
									FUSE SIZE		INTERLOCKS		PILOT DEVICES: 30 mm **					

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249–000020–01

REV	DESCRIPTION	BY	DATE										
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UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: 30 mm ** ON LIGHT	PILOT DEVICES: 30 mm ** OFF LIGHT	PILOT DEVICES: 30 mm ** ADDL P/L	PILOT DEVICES: 30 mm ** SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
10M	CB-U-1310 UVR U1310 UV BANK 3A	BRANCH BKR			HL 150	150											(1) 14-2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249-000020-03
																	T/M BKR	
10Q	CB-U-1320 UVR U1320 UV BANK 3B	BRANCH BKR			HL 150	150											(1) 14-2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249-000020-03
																	T/M BKR	
10U	CB-U-1330 UVR U1330 UV BANK 3C	BRANCH BKR			HL 150	150											(1) 14-2/0AWG WIRE/PH, 80% RATED, AL MECH LUG AL/CU CABLE, Screw Down Comp. ID Labels, SOLID NEUTRAL,	E51085249-000020-03
																	T/M BKR	
11A	CB-U7201.MCB MAIN BREAKER	MAIN BKR			RK 3000	1200											(6) 1/0-750KCMIL WIRES/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE,	E51085249-000020-05
																	ELECTRONIC AMMETER TRIP UNIT, HEAT SHRINK WIRE LABELS, KEY INTERLOCK, LSIG TRIP FUNCTION, RING TONGUE TERMINALS,	
																	Screw Down Comp. ID Labels, SOLID NEUTRAL, 3 CT's, LV848891SP MDGF MODULE, (4) S33579 MDGF CURRENT SENSORS	
12A	PULL CABLE SECTION	72" SPECIAL UNIT															Screw Down Comp. ID Labels, Cable pull section, CTAC210 ZERO SEQUENCE CT	E51085249-000020-05

CB-U1310

CB-U1320

CB-U1330

CTAC120

UNIT LOC	UNIT NAMEPLATES	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI	SEC	NO	NC	ON LIGHT	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
									FUSE SIZE		INTERLOCKS		PILOT DEVICES: 30 mm **					

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7101 MCC-U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	UNIT INFORMATION
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG#	I51085249-000020-01 PG 5 OF 5 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--	–	----	--	--/--/--
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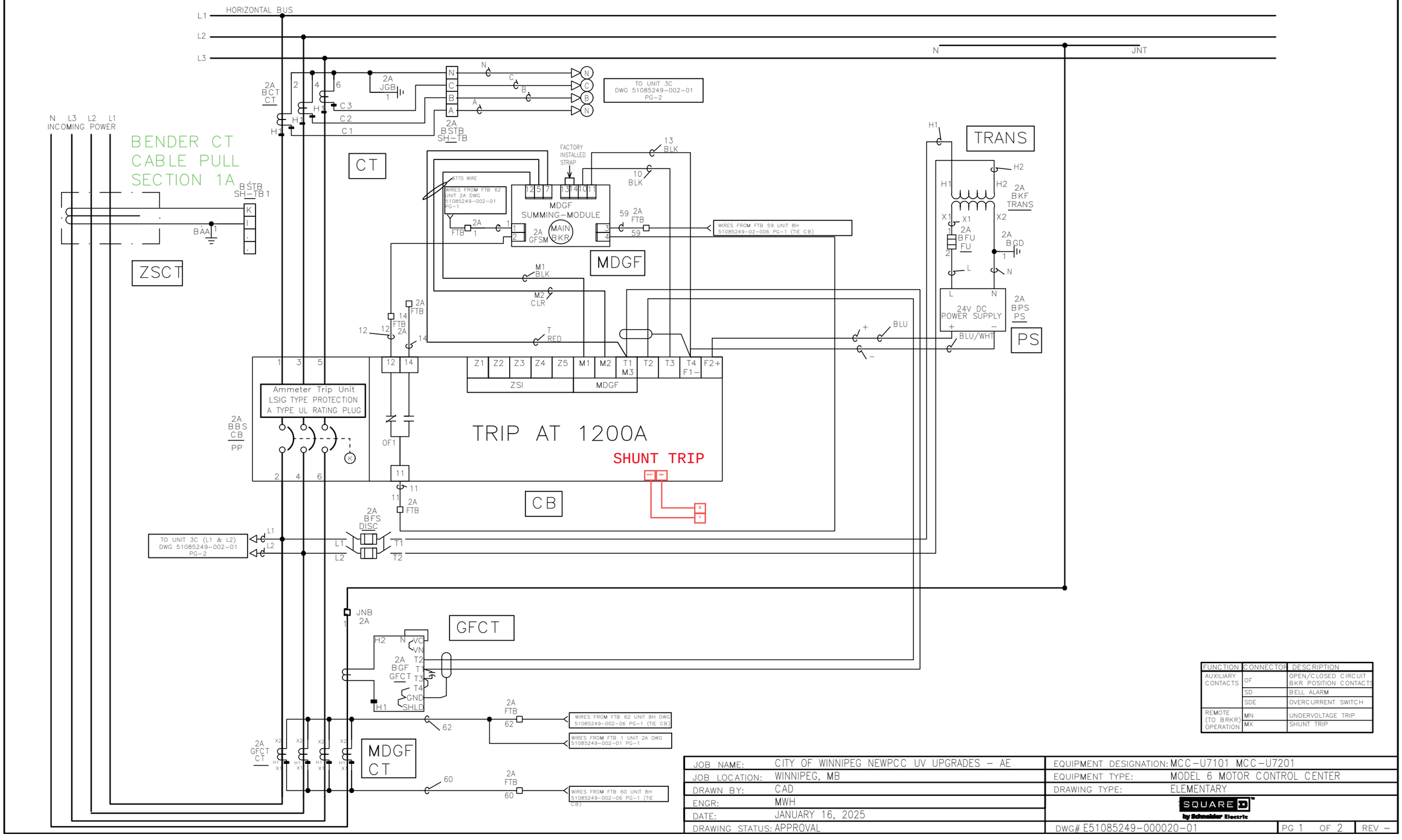
CIDL, HSWM, RTT



FUNCTION	CONNECTOR	DESCRIPTION
AUXILIARY CONTACTS	OF	OPEN/CLOSED CIRCUIT BKR POSITION CONTACTS
	SD	BELL ALARM
	SDE	OVERCURRENT SWITCH
REMOTE (TO BRKR) OPERATION	MN	UNDERVOLTAGE TRIP
	MX	SHUNT TRIP

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249-000020-01	PG 1 OF 2 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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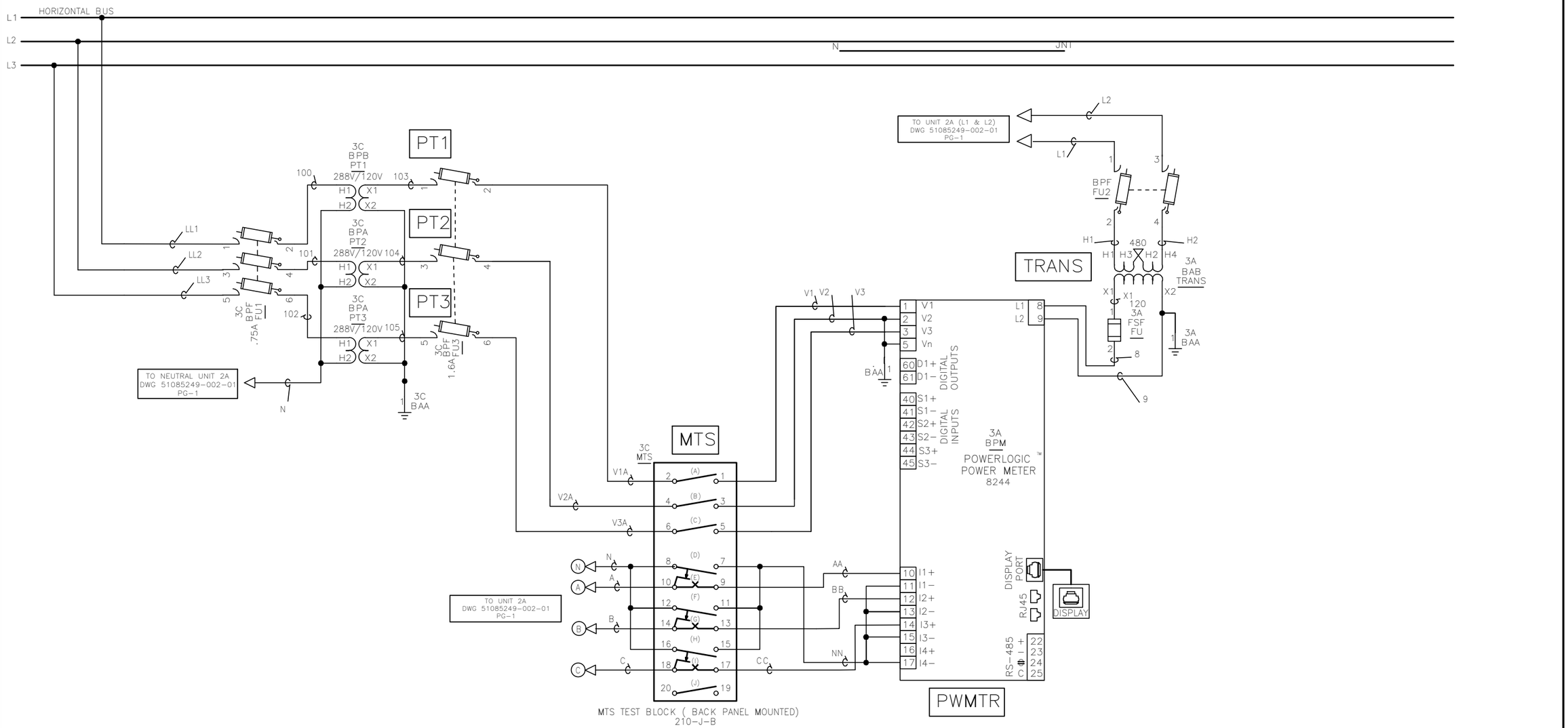
CIDL, HSWM, RTT



INSTALLER NOTE:
IF THE METERING UNIT IS MOUNTED IN A SEPARATE SHIPPING SPLIT THAN THE MAIN THEN THE CT CONNECTIONS ARE ROLLED UP IN THE METERING UNIT AND THE CT SHORTING BLOCK IS LEFT SHORTED FOR SHIPPING PURPOSES. INSTALLER IS TO RECONNECT CT WIRING AND REMOVE CT SHORTING JUMPERS AT TERMINAL BLOCK BEFORE ENERGIZING MCC.

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249-000020-01	PG 2 OF 2 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
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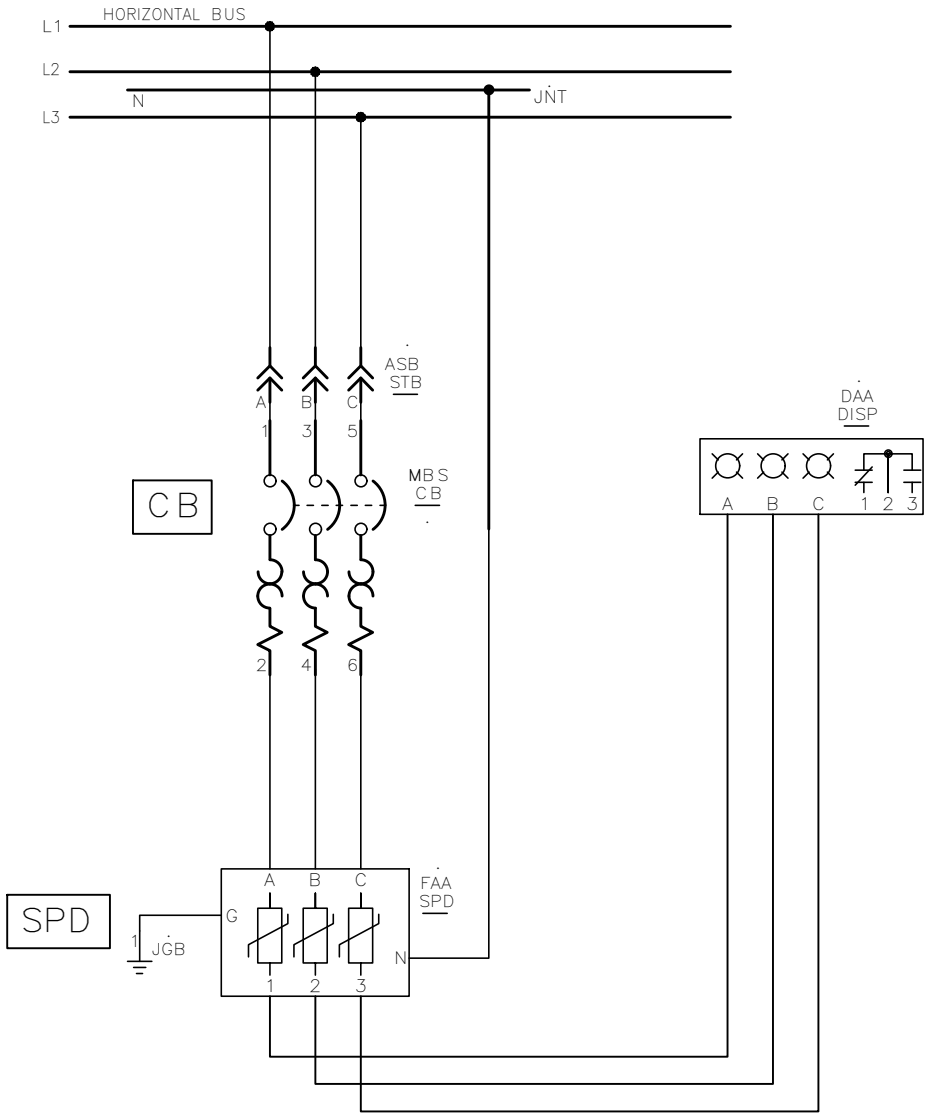
CIDL, HSWM



JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249–000020–02	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
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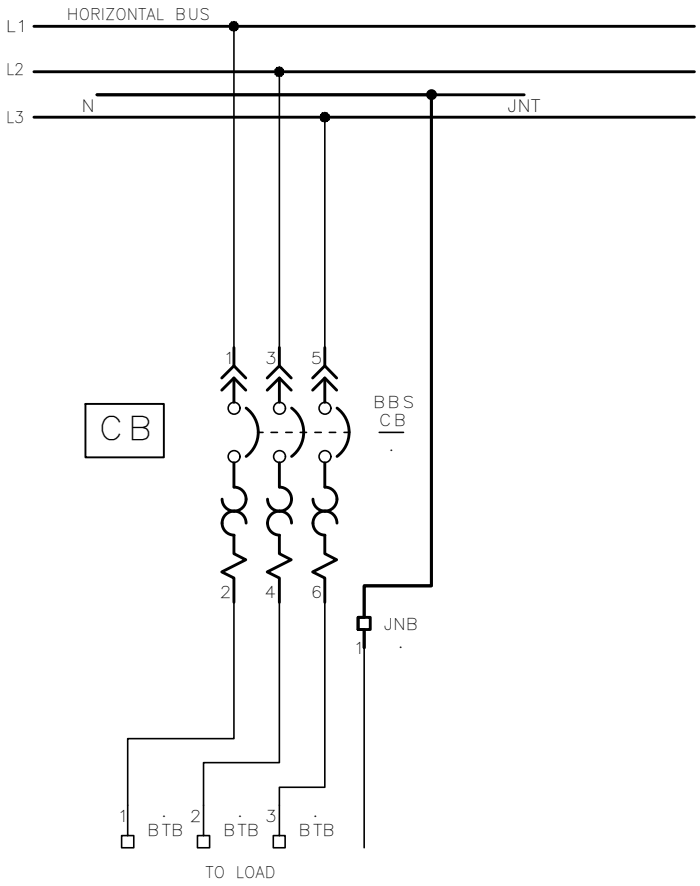
CIDL



JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249-000020-03	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
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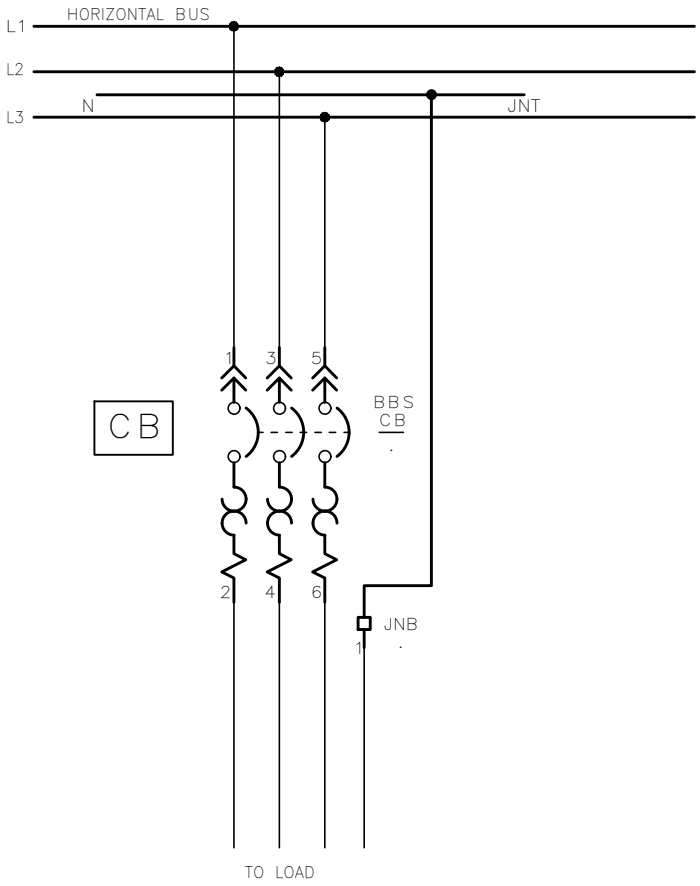
CIDL



JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249-000020-04	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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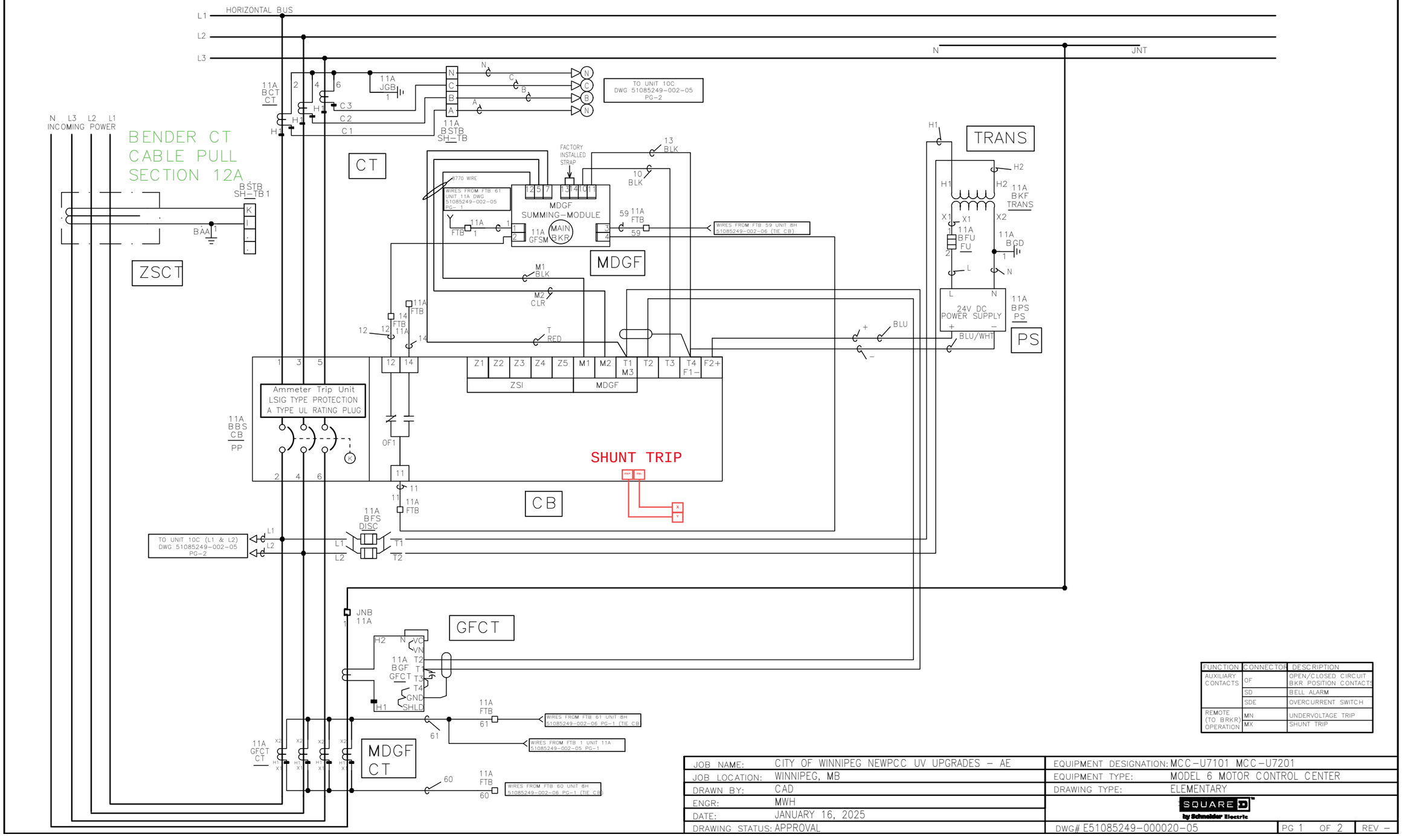
CIDL, HSWM, RTT



FUNCTION	CONNECTOR	DESCRIPTION
AUXILIARY CONTACTS	OF	OPEN/CLOSED CIRCUIT BKR POSITION CONTACTS
	SD	BELL ALARM
	SDE	OVERCURRENT SWITCH
REMOTE (TO BRKR) OPERATION	MN	UNDERVOLTAGE TRIP
	MX	SHUNT TRIP

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7101 MCC-U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249-000020-05	PG 1 OF 2 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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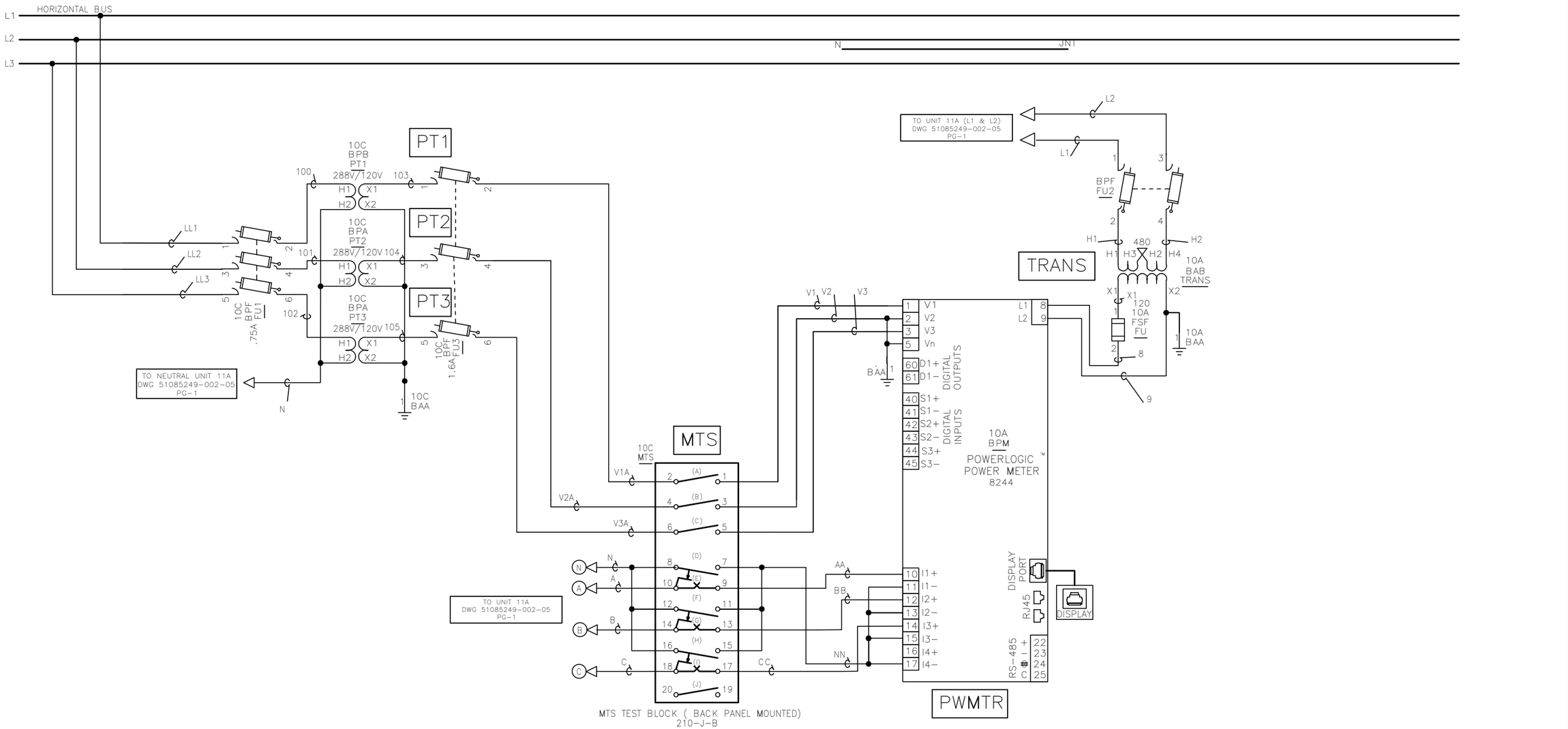
CIDL, HSWM, RTT



INSTALLER NOTE:
IF THE METERING UNIT IS MOUNTED IN A SEPARATE SHIPPING SPLIT THAN THE MAIN THEN THE CT CONNECTIONS ARE ROLLED UP IN THE METERING UNIT AND THE CT SHORTING BLOCK IS LEFT SHORTED FOR SHIPPING PURPOSES. INSTALLER IS TO RECONNECT CT WIRING AND REMOVE CT SHORTING JUMPERS AT TERMINAL BLOCK BEFORE ENERGIZING MCC.

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249-000020-05	PG 2 OF 2 REV –

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--	–	----	--	--/--/--
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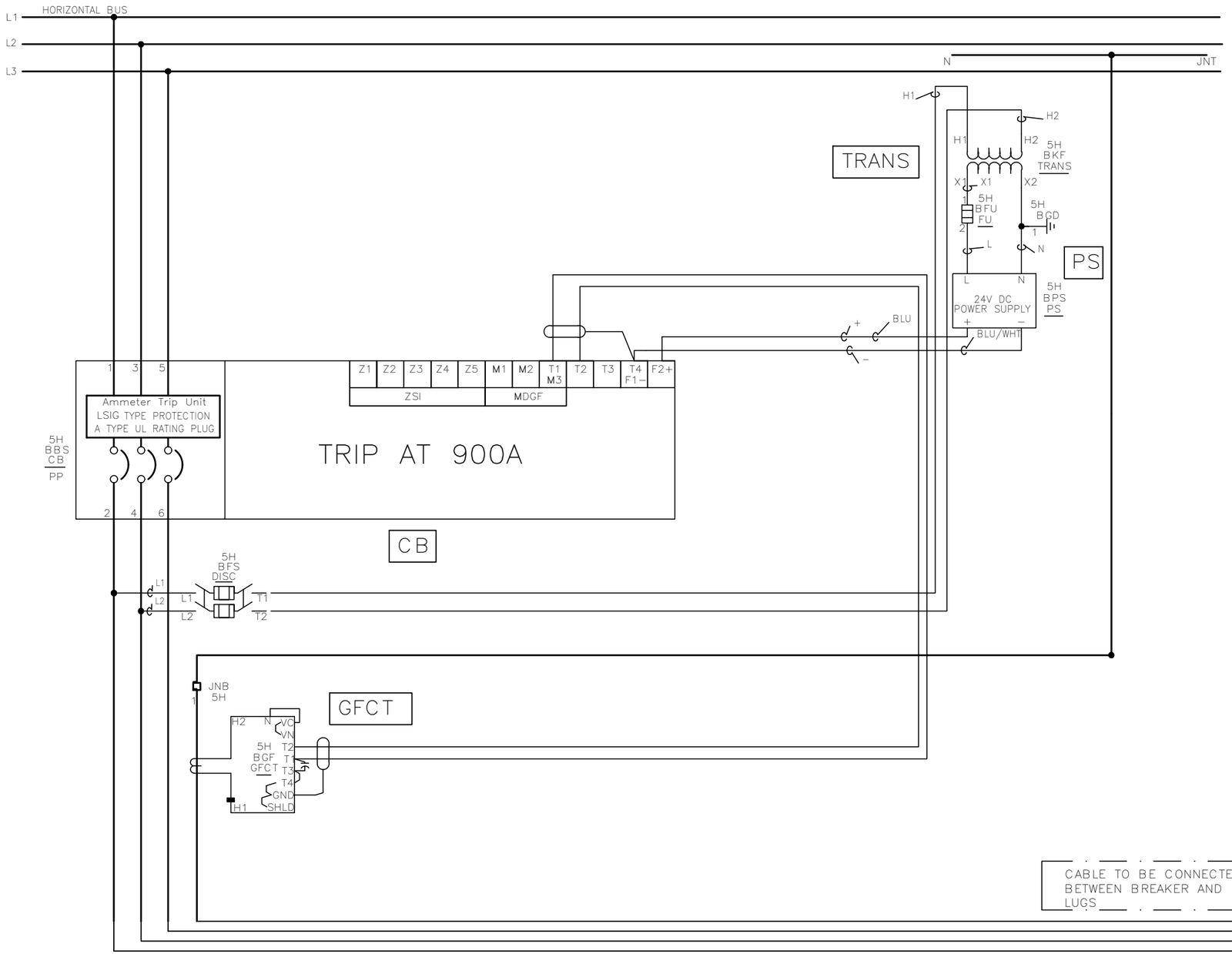
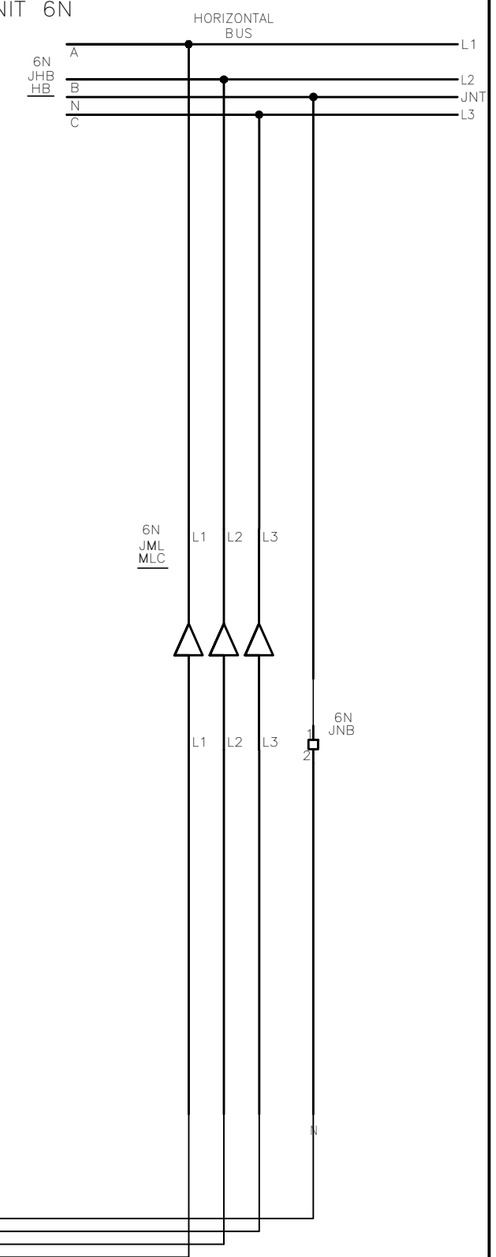
UNIT 5H



UNIT 6N



FUNCTION	CONNECTOR	DESCRIPTION
AUXILIARY CONTACTS	OF	OPEN/CLOSED CIRCUIT BKR POSITION CONTACTS
	SD	BELL ALARM
	SDE	OVERCURRENT SWITCH
REMOTE (TO BRKR) OPERATION	MN	UNDERVOLTAGE TRIP
	MX	SHUNT TRIP

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249-000020-06	PG 1 OF 1 REV –

REV	DESCRIPTION	BY	DATE
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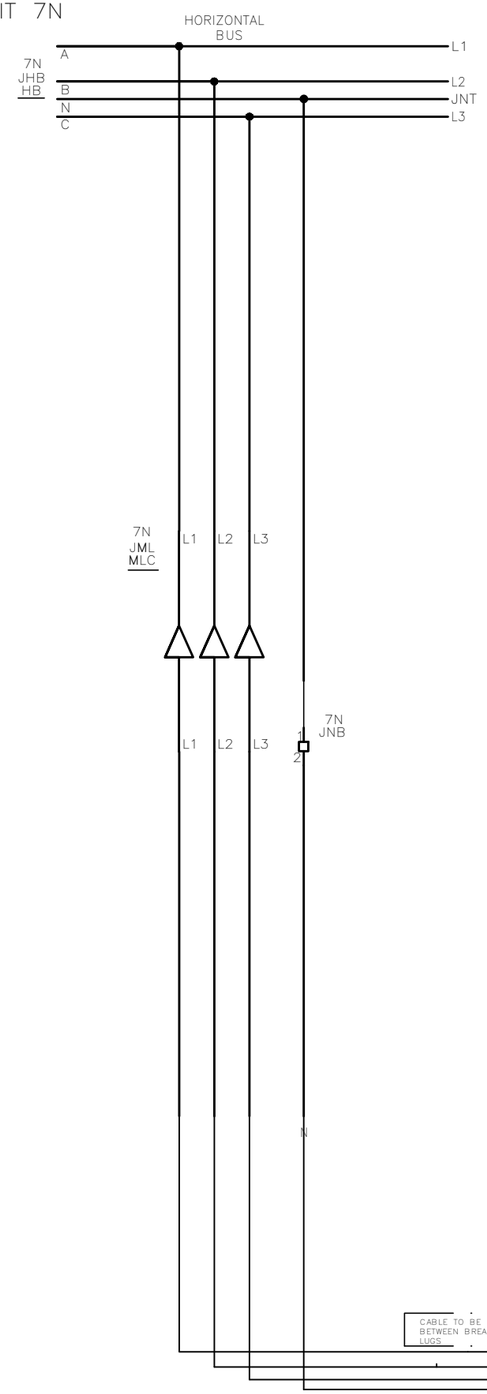
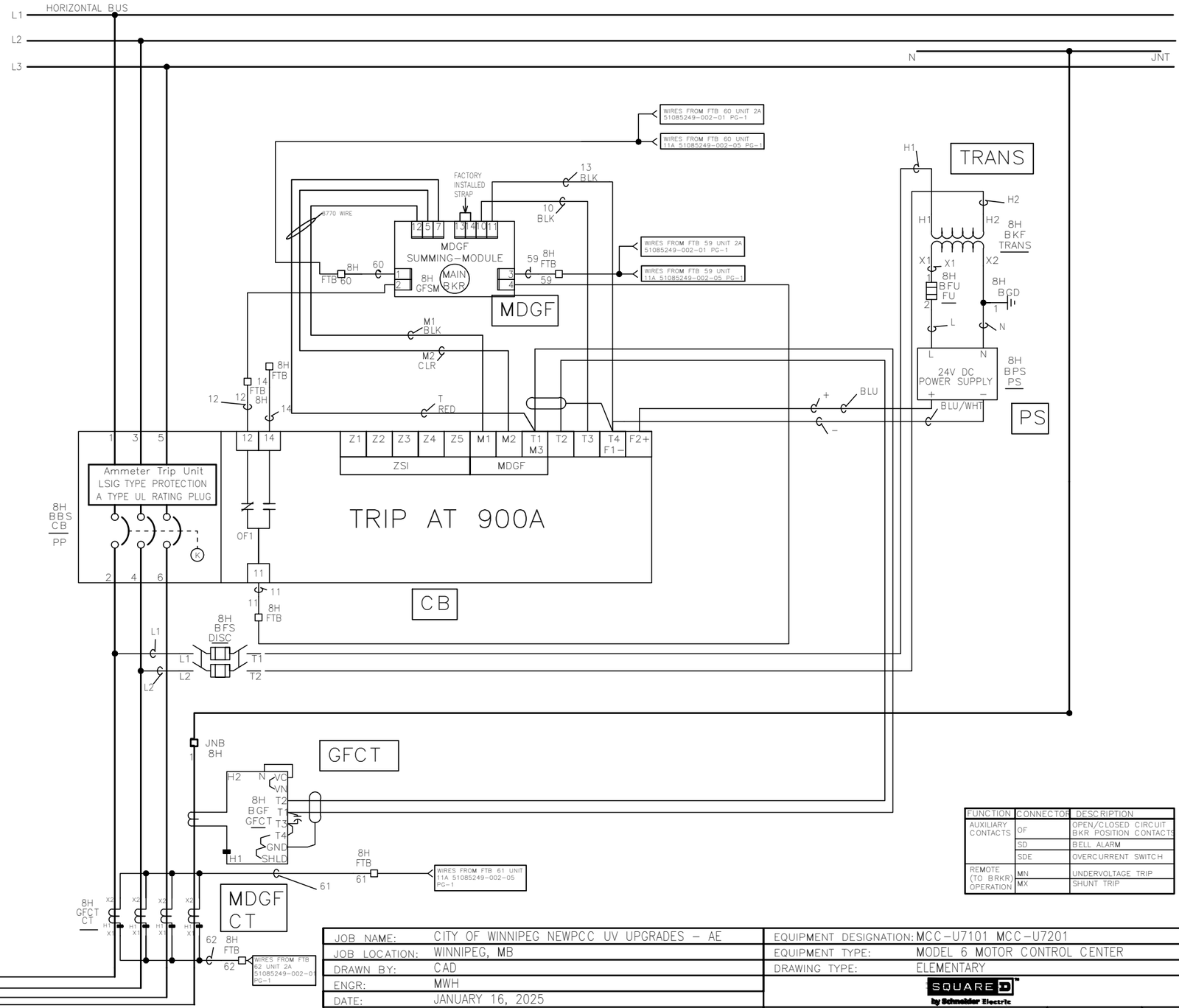
CIDL, HSWM, RTT

UNIT 7N



UNIT 8H



FUNCTION	CONNECTOR	DESCRIPTION
AUXILIARY CONTACTS	OF	OPEN/CLOSED CIRCUIT BKR POSITION CONTACTS
	SD	BELL ALARM
	SDE	OVERCURRENT SWITCH
REMOTE (TO BRKR) OPERATION	MN	UNDERVOLTAGE TRIP
	MX	SHUNT TRIP

JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC-U7101 MCC-U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		SQUARE D by Schneider Electric
DATE:	JANUARY 16, 2025	DWG# E51085249-000020-07	PG 1 OF 1 REV –
DRAWING STATUS:	APPROVAL		

REV	DESCRIPTION	BY	DATE	–	----	--	--/--/--
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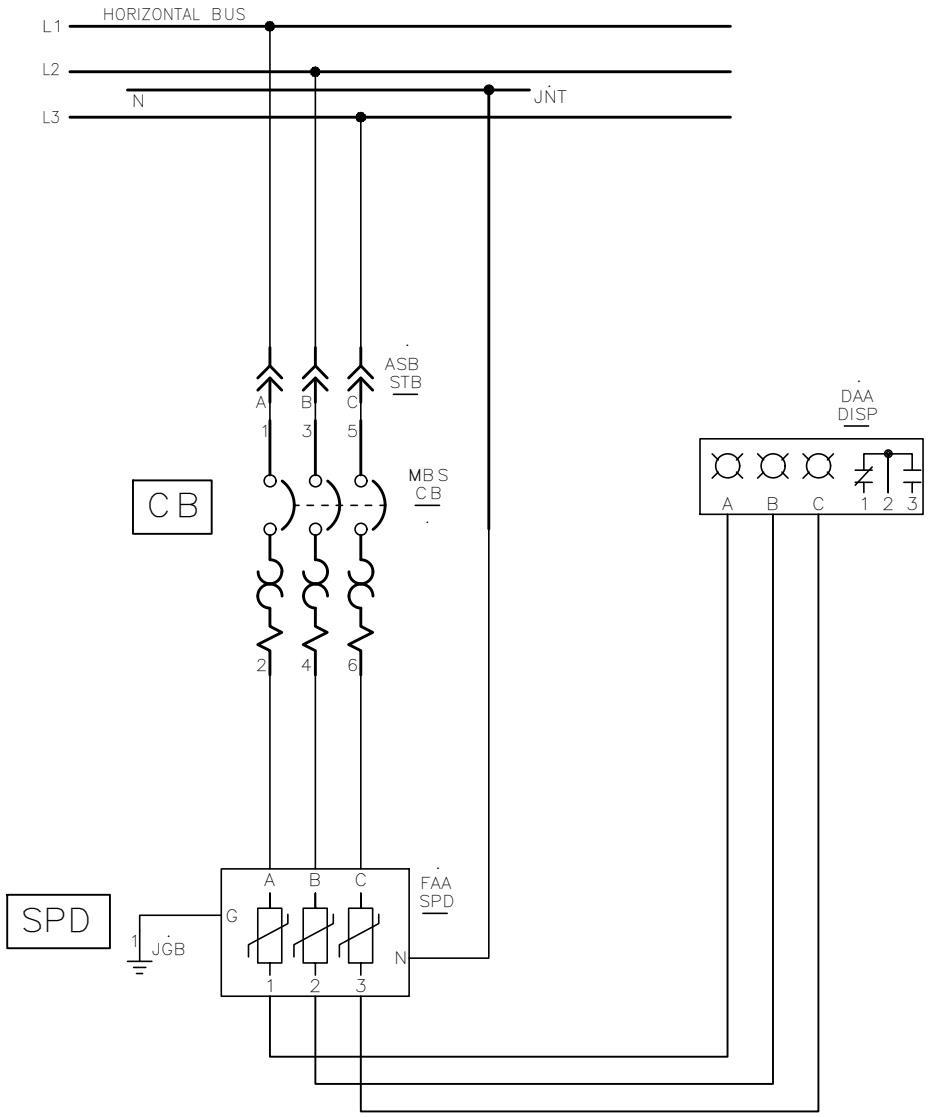
CIDL, HSWM



JOB NAME:	CITY OF WINNIPEG NEWPCC UV UPGRADES – AE	EQUIPMENT DESIGNATION:	MCC–U7101 MCC–U7201
JOB LOCATION:	WINNIPEG, MB	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	CAD	DRAWING TYPE:	ELEMENTARY
ENGR:	MWH		
DATE:	JANUARY 16, 2025		
DRAWING STATUS:	APPROVAL	DWG# E51085249–000020–08	PG 1 OF 1 REV –