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| Version | Date | Description of Revisions |
| 1 | August 30, 2006 | Approved final document. |
| 2 | February 19, 2010 | Modified ‘Related Sections’ and approved suppliers |
| 3 | June 10, 2013 | Final Draft – Consolidated Comments Spec Update Project |
| 4 | June 19, 2013 | Incorporation of new Commissioning Specification cross reference. Incorporated several aspects of the NL building specifications. |
| 5 | July 30, 2014 | Changes to reflect renaming of commissioning specification and final review (AV) |
| **6** | **February 4, 2015** | **Updated, Finalized Specification – Reference eDOCS #5630515 v7 (AV) and amended company name** |
| 7 | February 10, 2017 | Revised the list of acceptable manufacturers for each product. This involved converting some products to performance/ standard based specifications.(CPD PMO, OMM) (AV)  Updated Reference Standards (CAN/CSA-C61869-3:14, CSA C22.2 No.5-16, CSA C22.2 No. 178.1-14, ANSI/NEMA ICS 2 -2000 (R2005), NEMA ICS 4-2015) (AAM) |

NOTE:

This is a CONTROLLED Document. Any documents appearing in paper form are not controlled and should be checked against the on-line file version prior to use.

**Notice:** This Document hardcopy must be used for reference purpose only.

**The on-line copy is the current version of the document.**

# GEneral

## Scope

### Furnish and install the low voltage automatic transfer switches having the ratings, features/accessories and enclosures as specified in this Section and as shown on the Contract Drawings.

## Related Sections

### [Under "Related Sections", identify other Sections that are related to, and/or dependent on, the work results or information specified elsewhere. The list should be limited to Sections with specific information that the reader might expect to find in this Section, but is specified elsewhere. For example, if hardware for aluminum entrances is specified in the aluminum entrance Section, a cross-reference would be appropriate in the finish hardware Section. The purpose of this cross-referencing is for information only, to aid in finding those other requirements—not to define the scope of the Section.

### Cross-referencing here may also be used to coordinate assemblies or systems whose components may span multiple Sections and which must meet certain performance requirements as an assembly or system.

### Contractor is responsible for coordination of the Work. Contractor is responsible for being familiar with and incorporating all required elements of cross-referenced Specifications cited.

### This Section is to be completed/updated during the design development by the Consultant. If it is not applicable to the section for the specific project it may be deleted.]

### [List Sections specifying installation of products supplied but not installed under this Section and indicate specific items.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Execution requirements for ...[item]... specified under this Section.

### [List Sections specifying products installed but not supplied under this Section and indicate specific items.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Product requirements for ...[item]... for installation under this Section.

### [List Sections specifying related requirements.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: [Optional short phrase indicating relationship].

### Section 01250 – Substitutions

### Section 01300 – Submittals

### Section 01425 – Computerized Maintenance Management System Data Requirements

### Section 01430 – Operation and Maintenance Data

### Section 01780 – Contract Closeout

### Section 01810 – Equipment Testing and Facility Commissioning

### Section 01820 – Demonstration and Training

### Section 16010 – Electrical General Requirements

### Section 16031 – Inspection and Testing

### [Division 13 – SCADA and Instrumentation - insert applicable specifications]

### Product requirements for [item]... for installation under this Section.

## References

### The automatic transfer switches and all components shall be designed, manufactured and tested in accordance with the following standards:

#### American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers, Inc. (IEEE)

##### ANSI/IEEE C37.20.3-2013, IEEE Standard for Metal-Enclosed Interrupter Switchgear (1 kV – 38 kV

#### Canadian Standards Association (CSA)

##### CAN/CSA-C61869-3:14 - Instrument transformers - Part 3: Additional requirements for inductive voltage transformers (Adopted IEC 61869-3:2011, edition 1.0:2011, with Canadian deviations)CSA C22.2 No.5-16, Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, and NMX-J-266-ANCE-2016).

##### CSA C22.2 No. 31-14, Switchgear Assemblies

##### CSA C22.2 No. 178.2-04 (R2014), Requirements for Manually Operated Generator Transfer Panels.

##### CSA C22.2 No. 178.1-14, Transfer Switch Equipment (Tri-national standard, with NMX-J-672-ANCE and UL 1008).

#### National Electrical Manufacturers Association (NEMA)

##### ANSI/NEMA ICS 2 -2000 (R2005) Controllers, Contactors, and Overload Relays, Rated 600V

##### NEMA ICS 4-2015, Application Guideline for Terminal Blocks.

## Measurement and Payment

*[Choose one of the following payment language provisions that best suits the individual project.*

*If this Section is not specifically referenced by an item in the Bid Form, please use the following language:*

### The work of this Section will not be measured separately for payment. All costs associated with the work of this Section shall be included in the Contract Price.

*OR If this Section is specifically referenced in the Bid Form, use the following language and identify the relevant item in the Bid Form:*

### All costs associated with the work of this Section shall be included in the price(s) for Item No(s). \_\_\_ in the Bid Form.

*If the work of this Section is to be measured and paid for by several different methods, please amend the standard wording given above to reflect the different methods of measurement and payment.*]

## Submittals – for Review/Approval

### The following information shall be submitted to the Consultant [Consultant to specify in this subsection the timing of receipt of Submittals in order to maintain the overall project schedule and subsequent testing and commissioning activities]:

#### Information required by Section 01425 - Computerized Maintenance Management System Data Requirements.

#### Make, model and type

#### Master drawing index

#### Front view and plan view of the assembly

#### Schematic diagram

#### Nameplate schedule

#### Component list

#### Conduit space locations within the assembly.

#### Assembly ratings including:

##### Short-circuit rating

##### Voltage

##### Continuous current rating

#### Major component ratings including:

##### Voltage

##### Continuous current rating

##### Interrupting ratings

#### Cable terminal sizes

#### Product data sheets

#### Single line diagram showing controls and relays

#### Description of equipment operation including:

##### Automatic starting and transfer to standby unit and back to normal power

##### Test control

##### Manual control

##### Automatic shutdown

## Submittals – for Construction

### The following information shall be submitted to the Consultant for record purposes:

#### Final as-built drawings.

#### Wiring diagrams of components, controls and relays.

#### Certified production test reports.

#### Installation information.

#### Part list with parts catalogue numbers.

#### Provide operation and maintenance data for automatic load transfer equipment for incorporation into manual specified in Section 01780 – Contract Closeout.

#### Schematic diagram of components, controls and relays.

#### Illustrated parts lists with parts catalogue numbers.

#### Certified copy of factory test results.

## System Description

### Automatic load transfer equipment shall:

#### Monitor voltage on phases of normal power supply.

#### Initiate cranking of standby generator unit on normal power failure or abnormal voltage on any one phase below preset adjustable limits for adjustable period of time.

#### Transfer load from normal supply to standby unit.

#### Transfer load from standby unit to the normal power supply [when normal power is restored, confirmed by sensing voltage on phases above the adjustable pre-set limit for adjustable time period].

#### Shut down standby unit after running unloaded to cool down using adjustable time delay relay.

## Qualifications

### The Contractor shall ensure that the manufacturer of the assembly is the manufacturer of major components and control modules installed within the assembly selected from the list of suppliers/manufacturers specified in this Section or as approved by the Consultant.

## Delivery, Storage and Handling

### Equipment shall be handled and stored in accordance with manufacturer’s instructions. One copy of these instructions shall be included with the equipment at time of shipment. In the event maintenance is required for long term storage, the Contractor will be responsible for such. The Contractor shall be responsible for all costs incurred as a result of any damage or deterioration caused by long term storage.

## Operation and Maintenance Manuals

### Equipment operation and maintenance manuals shall be provided with each assembly shipped, and shall include instruction leaflets and instruction bulletins for the complete assembly and each major component.

### Include detailed instructions to facilitate the effective operation, maintenance and repair of each assembly.

### Refer to Section 01430 – Operation and Maintenance Data for requirements.

# PRODUCTS

## Acceptable Manufacturers

### Automatic Transfer Switch:

#### Acceptable Manufacturers:

##### Eaton Industries (Canada) Company

##### ASCO Power Technologies

##### Thomson Technology.

##### Approved Equivalent.

### The Automatic Transfer Switch (ATS) must function with existing switchgear. The listing of specific suppliers/manufacturers above does not imply acceptance of its products that do not meet the ratings, features and functions specified in this Section.

## Main Switch Gear:

### Certified to CSAC22.2, No. 31-14

### Complies with ANSI/IEEE C37.20.3-2013

## Ratings

### The transfer switch shall have equal withstand, closing and interrupting ratings.

#### The transfer switch shall be 100% equipment rated for continuous duty.

#### The voltage rating of the transfer switch shall be no less than the system voltage rating.

#### The continuous current rating of the transfer switch shall be no less than the maximum continuous current requirements of the system.

#### The transfer switch shall be 100% equipment rated for continuous duty as shown on the Drawings and shall conform to the applicable CSA requirements.

#### The automatic transfer switches shall be fully rated to protect all types of loads, inductive and resistive, from loss of continuity of power, without de-rating, either open or enclosed.

## Construction

### The switching panel shall consist of completely enclosed contact assemblies and a separate control logic panel. Control power for all transfer operations shall be derived from the line side of the source to which the load is being transferred.

### Each transfer switch shall be positively interlocked both mechanically and electrically to prevent the simultaneous closing of both sources under either automatic or manual operation. Main contacts shall be mechanically locked in position in both normal and emergency positions.

### Transfer switches shall be capable of being operated manually under full rated load conditions. Manual operation shall be accomplished by integrally mounted pushbuttons. Removable manual operating handles, and handles that may move in the event of an electrical operation during the manual operation, are not acceptable. Manual operators requiring source or load disconnection prior to manual operation are not acceptable.

### On transfer switches requiring a fourth pole for switching the neutral, the neutral shall be fully rated with equal withstand, closing and interrupting ratings to the power poles. Switched neutral poles which are add-on or overlap, or that are not capable of breaking full rated load current are not acceptable.

## Microprocessor Logic

### The transfer switch shall be controlled by a microprocessor-based controller. The controller shall be hardened against potential problems from transients and surges. Operation of the transfer switch and monitoring of both sources shall be managed by the controller. Design the equipment or provide equipment that accounts for the historic facility power quality provided by the Local Distribution Company so the equipment will not be susceptible to damage or operational outages due to sags and swells on the power supply to the facility. Provide appropriate protection for sensitive electronic equipment and components from historic power quality conditions. Critical components shall have non-volatile memory or battery backup.

## Wiring/Terminations

### Terminal blocks shall conform to NEMA ICS 4. Terminal facilities shall be arranged for the entrance of external conductors from the top or bottom of the enclosure. The main transfer switch terminals shall be suitable for the termination of conductors shown on the Contract Drawings.

## Enclosure

### Each transfer switch shall be provided in an enclosure suitable for use in the environment indicated in the Drawings.

# EXECUTION

## Factory Testing

### The following standard factory tests shall be performed on the equipment provided under this Section. All tests shall be performed in accordance with the latest version of the applicable CSA and NEMA standards. The complete equipment set, including the transfer mechanism, control, relays, and accessories, shall be factory assembled and tested.

#### Insulation check to ensure the integrity of insulation and continuity of the entire system.

#### Visual inspection to ensure that the switch matches the specification requirements and to verify that the fit and finish meet quality standards.

#### Mechanical tests to verify that the switch's power sections are free of mechanical hindrances.

#### Check selector switch in modes of operation (Test, Auto, Manual, Engine Start) and record results.

#### Check voltage sensing and time delay relay settings.

#### Check:

##### Automatic starting and transfer of load on failure of normal power.

##### Retransfer of load when normal power supply resumed.

##### Automatic shutdown

### The Contractor shall ensure that the manufacturer will provide three certified copies of the factory test reports to the Consultant and Region for approval. The Contractor shall also submit a copy of the rest reports in an electronic format suitable for up-load to the Region’s CMMS (Maximo). Refer to Section 01425 - Computerized Maintenance Management System Data Requirements.

## Field Quality Control

### Provide the services of a qualified factory-trained manufacturer’s representative to assist the Contractor in installation and start-up of the equipment specified under this Section. The manufacturer’s representative will provide technical direction and assistance to the Contractor in the general assembly of the equipment, connections and adjustments, and testing of the assembly and components contained therein. Start-up procedures shall include all necessary steps to complete and verify installation. SATs will be performed under actual operating conditions. The Contractor shall provide notice to the Consultant and Region a minimum of 10 Working Days prior to the proposed testing date(s). The Consultant and Region must approve the schedule of work and proposed testing dates. The proposed testing dates may be delayed due to operational conditions, system demand and other factors at no cost to the Region.

### The Contractor shall provide three copies of the manufacturer’s field start-up procedures and documentation to the Consultant.

### Perform tests in accordance with Section 16031 – Inspection and Testing and Section 01810 – Equipment Testing and Facility Commissioning Requirements.

### In general, the testing procedure (where applicable and as amended by the Consultant) includes the activities summarized below:

#### Energize transfer equipment from normal power supply.

#### Set selector switch in "Test" position to ensure proper standby start, running, transfer, retransfer. Return selector switch to "Auto" position to ensure standby shuts down.

#### Set selector switch in "Manual" position and check to ensure proper performance.

#### Set selector switch in "Engine start" position and check to ensure proper performance. Return switch to "Auto" to stop engine.

#### Set selector switch in "Auto" position and open normal power supply disconnect. Standby should start, come up to rated voltage and frequency, and then load should transfer to standby. Allow to operate for 10 min, then close main power supply disconnect. Load should transfer back to normal power supply and standby should shutdown.

#### Repeat, at 1h intervals, three times. Test the selector switch in each position for each test.

## Manufacturer’s Certification

### The Contractor shall ensure that a qualified factory-trained manufacturer’s representative will certify in writing that the equipment has been installed, adjusted and tested in accordance with the manufacturer’s recommendations.

### The Contractor shall provide three copies of the manufacturer’s representative’s certification to the Consultant and Region staff in an electronic format suitable up-load to the Region’s CMMS (Maximo). Refer to Section 01425 - Computerized Maintenance Management System Data Requirements.

## Training

### The Contractor shall provide a training session for Regional staff.

### The Contractor shall ensure that the training session will be conducted by a manufacturer’s qualified representative. The training program shall consist of the instruction on the operation of the assembly, circuit breakers, maintenance procedures and major components within the assembly.

### Perform demonstration and training in accordance with Section 01820 – Demonstration and Training in conjunction with the above requirements.

## Installation

### The Contractor shall install all equipment in accordance with the manufacturer’s recommendations and the Contract Drawings.

### All necessary hardware to secure the assembly in place shall be provided by the Contractor.

### All equipment shall be installed and checked in accordance with the manufacturer’s recommendations.

## Commissioning

### For all commissioning activities on systems where components of this Specification are integral to functionality, refer to Section 01810 – Equipment Testing and Facility Commissioning. All inspection and testing activities shall be completed in accordance with the commissioning plan that shall be provided to the Consultant prior to the commencement of commissioning activities.

**END OF SECTION**