



Rombout Fire District  
New Station No.2

1548 NYS Route 52  
Fishkill, NY

Project Number: 18142

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Notice to All Contractors:

The following amplifications, corrections, etc., to plans and specifications are hereby drawn to your notice and shall be incorporated in contract:

**Addendum No. 1 ( 43 pages total, including cover sheet)**

**Date: January 12, 2023**

Att: Estimating Department

Sent By: Keith Scofield

Please sign and return that you have received this email:

Received By: \_\_\_\_\_

Date: \_\_\_\_\_

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## **ROMBOUT FIRE DISTRICT - NEW FIRE STATION #2**

1548 N.Y.S. Route 52, Fishkill, New York

### **ADDENDUM NO. 4**

January 12, 2023

1. Correction to the construction timeline: Construction to Begin – March 1, 2023; Construction to Complete – July 31, 2024
2. A vendor whose company manufactures four fold style apparatus bay doors requested to have their product considered as an alternate to the specified four fold door manufacturer. Please use the specified door and manufacturer in your bid as the competitor's door does not meet the requirements of the specified door. The submission would be rejected.
3. This notice is to clarify the Electrical Contractor's scope of work as it pertains to the fire alarm. The electrical contractor shall furnish and install conduits with nylon drag lines, junction boxes, supporting hardware, etc. to fire alarm device locations as per design documents. Johnson Controls (the owner's provided vendor) shall be responsible to furnish and install all fire alarm devices, power panels, control panels, cables, etc. to render a complete and operational fire alarm system per the design documents.
4. **Question:** Has the filing for specified backflow device been approved by the department of health & municipality?  
**Answer:** No, it has not.
5. **Question:** There is a note on the door schedule that calls for laminated insulated glazing in the doors. Being there is no glass specification, is this glazing is required for entire project or just in the doorlights (less the sidelights, transom, etc.)  
**Answer:** See the attached glass specification - Section 08800 Glazing
6. **Question:** Door 17 calls for HM frame and D4 (Flush Exterior Door) which shows as hollow metal. Looking at East elevation on A200 it looks to be a half-lite HM exterior door.  
**Answer:** Door # 17 shall be Door Type D5 Hollow Metal w/ half light and a HM frame.
7. **Question:** And the Hardware Set 1.0 for aluminum entrances is left to interpretation. The power supply does not call out anything.  
**Answer:** The power supply is required for the Integrated Locking Device (SN200 Exit Device)
8. **Question:** Permanent Core CR8000 is vague, 6-pin, 7-pin, keyway?? We do not see a cylinder housing called out. Is this included in nomenclature for the panic device?  
**Answer:** The CR8000 is a 6-pin removable core. For 7 pin the number would be CR8000-7. The CT6B reference in the exit device product number string indicates cylinder housings with temporary cores.

9. **Question:** There is see no architectural detail regarding **threshold**?  
**Answer:** Provide a thermally broken ADA compliant aluminum saddle with maximum ½" rise. Threshold width to be compatible with the frame depth of the opening.
10. **Question:** Aluminum Frames and Doors call for Dark Bronze Anodized while the hardware calls 626, 630, 689 finishes?  
**Answer:** The PCS did not call for a different finish for hardware at the AL/GL doors.
11. **Question:** Would they want a clear anodized gear hinge and EL-CEPT power transfer or DKB to match frame and door?  
**Answer:** The PCS did not call for a different finish for hardware at the AL/GL doors.
12. **Question:** Can the (2) W36x232 beams that are approximately 75' long have a spliced connection for handling and trucking purposes? Please advise.  
**Answer:** Splicing of the apparatus bay beams is acceptable but is considered contractors means and methods. Details of beam splices are to be provided by the steel supplier per AISC requirements. Submittal must demonstrate capacity of proposed splice details to develop full cross-sectional capacity of the member, in accordance with the requirements of the Contract Documents.
13. **Question:** Does the shop of fabricator require any special certifications?  
**Answer:** The fabricator requirements are in the structural project specifications. The steel must meet the ASTM requirements per the spec. The fabricator will have to provide mill certificates for the material.
14. **Question:** Does this require US made materials?  
**Answer:** It is not required.
15. **Question:** In Alternate 2, The specified manufacturer for the Jib Crane for the Apparatus Bay column states there is not enough information given to quote the chain hoist. Please provide more information.  
**Answer:** Provide a Manual Hoist & Trolley Combination w/ 1,000 Lb. Capacity by Global Industrial - Model #: WR985903 MPN #: LOW-1P
16. If you were unaware, Specification Sections 01500 – Temporary Facilities; 042223 – Architectural Concrete Masonry; 07620 – Sheet Metal Flashing were added in Addendum #3.
17. Please see the attached Manufacturer's Cut-sheets:
1. Generac 20 kW Air-Cooled 3 Phase
  2. Generac ATS
  3. Kohler 20RCA g4272
  4. Kohler ATS
18. The chain link fence shall be provided in conformance with the written specification which indicates it is a delegated design to ensure the fence will withstand wind loads. If the delegated

design does not specify one of the parameters listed in the RFI, the specifications provide a value that should be used unless otherwise specified. For the height of the fence, the specification states 8 feet or as otherwise noted – so 6 feet should be used as indicated on the plans.

19. Burning of trash or construction debris is not permitted.
20. Each Contractor is responsible for daily clean-ups.
21. Code compliant scaffolding and staging is the responsibility of each Contractor.
22. Security fencing around the work areas of the site - Construction/Security fencing shall be provided, installed, and maintained during construction by the General Contractor around the partially completed areas of construction. It shall be a sturdy 8' high chain link with access gates and operating hardware and security devices.
23. The Electrical Contractor, who is responsible for temporary power and lighting, shall provide, but not limited to, a 120 volt duplex every 50 feet maximum on center, and a minimum of one 200-watt lamp per every 400 Sf of space.
24. Each Contractor shall be responsible to provide hand carried fire extinguishers per NFPA requirements in their work areas.
25. **Question:** Utility plan (Page C5) shows gas service on northeast side of property originating on north side of Rt.52. Plan C11 also shows gas line "approximate location" on North side of Rt.52. Please provide detail as to how to access existing gas line on north side of Rt.52. (open cut, horizontal drilling). Also, please verify what contract site gas work falls under, (GC or HVAC).  
**Answer:** The General Contractor is responsible for all work and fees associated with the new gas service from the CHG&E gas main to 5'-0" before the building or generator. How the GC decides the means and methods of installing gas service will be between the GC and CGH&E. The Mechanical Contractor is responsible for all work and fees associates with the new gas services from the building or generator to 5'-0" beyond. The GC and Mechanical Contractor shall coordinate installations and location of gas services between each other and CHG&E prior to installation. See Site Mechanical Drawing.
26. Note 14 on a addendum 1 states that the GC is responsible for the gas piping to 5' of the building. Our understanding is that the GC will be responsible for the excavation and backfill, as CHGE typically installs piping to the meter. Please confirm.  
**Answer:** The General Contractor is responsible for all work and fees associated with the new gas service from the CHG&E gas main to 5'-0" before the building or generator. How the GC decides the means and methods of installing gas service will be between the GC and CGH&E. The Mechanical Contractor is responsible for all work and fees associates with the new gas services from the building or generator to 5'-0" beyond. The GC and Mechanical Contractor shall coordinate installations and location of gas services between each other and CHG&E prior to installation. See Site Mechanical Drawing.

27. **Question:** What concrete sealer is to be used @ Apparatus Bay, electric rooms, etc. per finish schedule A-600? It was it is not specified on the #033000 specification.  
**Answer:** Use Cureseal-S with matte finish by L.M. Scofield Company
28. **Question:** Provide ceiling type for all exterior canopies.  
**Answer:** Use Hunter Douglas 300L aluminum ceiling panels with square edge.
29. **Question:** Provide ceiling type for all exterior canopies.  
**Answer:** Use Hunter Douglas 300L aluminum ceiling panels with square edge.
30. **Question:** A200 Exterior Elevations – A1 East Elevation – Provide detail to support brick installed over roof areas. Currently, roof intersects with roof area with no structure to support brick at roof interface.  
**Answer:** Structural Drawing S202 has column line 4 carrying masonry veneer and roof trusses. And can be seen on Building Section G1 on Drawing A300.
31. **Question:** A104 Proposed Roof Plan. The flat roof areas do not indicate roof drains. Are roof drains required?  
**Answer:** A roof drain will be required for the Main entry canopy and (2) drains for the rear canopy above the overhead doors.
32. **Question:** Kitchen 104 indicates kitchen cabinets and appliances are not in contract. Please confirm if counters are in contract.  
**Answer:** The countertops for Kitchen 104 are N.I.C.
33. **Question:** Deduct alternate 1 snow melt system. Please identify scope of work the GC should deduct. Is it under slab rigid insulation for the entire SOG area where snowmelt is installed?  
**Answer:** Just the insulation work under the slab.
34. Due to the thickness of the 1.5" continuous insulation on the metal stud framed walls, James Hardie is requiring a furring strip to be installed and secured through the insulation and into the metal wall studs. That furring strip may be 18 ga hat furring, 1x FRT wood, ¾" FRT plywood.
35. **Question:** 080671 Door Hardware Schedule - Indicates Notes: Balance of hardware by assembly supplier right before the end of the section. Please clarify note or provide required balance of hardware required.  
**Answer:** Disregard the note.

## SECTION 08800

### GLAZING

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Glass.
- B. Glazing compounds and accessories.

##### 1.02 RELATED REQUIREMENTS

- A. Section 07900 - Joint Sealers: Sealant and back-up material.
- B. Section 08110 – Steel Doors and Frames: Glazed doors and borrowed lites.
- C. Section 08410 – Metal Framed Storefront

##### 1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005.
- C. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2005.
- D. ASTM C 1036 - Standard Specification for Flat Glass; 2006.
- E. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass; 2004.
- F. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2005a.
- G. ASTM E 1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2007.
- H. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2002.
- I. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2004.
- J. GANA (SM) - FGMA Sealant Manual; Glass Association of North America; 1990.

##### 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation Meeting: Convene a pre-installation meeting one week before starting work of this section; require attendance by all affected installers.

##### 1.05 SUBMITTALS

- A. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- B. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

##### 1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years documented experience.

##### 1.07 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 50 degrees F (10 degrees C).
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

## 1.08 WARRANTY

- A. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

## PART 2 PRODUCTS

### 2.01 GLAZING TYPES

- A. Type IG-1 - Sealed Insulating Glass Units: Vision glazing, low-E. Minimum of 0.45 U value. See drawings for listing of manufacturer and requirements of low-E glazing.
  - 1. Application(s): All exterior glazing unless otherwise indicated.
  - 2. Total Thickness: 1 inch (25 mm).
  - 3. Glazing Method: Gasket glazing.
- B. Type S-1 - Single Vision Glazing:
  - 1. Applications: All interior glazing unless otherwise indicated.
  - 2. Type: Fully tempered float glass.
  - 3. Tint: Clear.
  - 4. Thickness: 1/4 inch (6 mm).
  - 5. Glazing Method: Gasket glazing.
- C. Type S-2 - Fire-Rated Safety Glazing:
  - 1. Applications: Provide this type of glazing in the following locations:
    - a. Glazed lites in fire doors.
    - b. Sidelights, borrow lites, and other glazed openings in partitions indicated as having an hourly fire rating.
    - c. Other locations indicated on the drawings.
  - 2. Fire Rating: As indicated on the drawings.
  - 3. Type: Glass-ceramic safety glazing.
  - 4. Thickness: 1/4 inch (6 mm).

### 2.02 EXTERIOR GLAZING ASSEMBLIES

- A. Structural Design Criteria: Select type and thickness to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with ASCE 7, and the NY State Building Code, See Structural Notes.
  - 1. Use the procedure specified in ASTM E 1300 to determine glass type and thickness.
  - 2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
  - 3. Thicknesses listed are minimum.
- B. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
  - 1. In conjunction with vapor retarder and joint sealer materials described in other sections.
  - 2. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
  - 3. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

### 2.03 GLASS MATERIALS

- A. Float Glass Manufacturers:
  - 1. AGC Flat Glass North America, Inc: [www.afgglass.com](http://www.afgglass.com).
  - 2. PPG Industries, Inc: [www.ppg.com](http://www.ppg.com).
  - 3. Substitutions: Refer to Section 01 60 00 - Product Requirements.
- B. Float Glass: All glazing is to be float glass unless otherwise indicated.
  - 1. Annealed Type: ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
  - 2. Heat-Strengthened and Fully Tempered Types: ASTM C 1048.
  - 3. Tinted Types: Color and performance characteristics as indicated.
  - 4. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.
- C. Glass-Ceramic Safety Glazing: UL- or WH-listed as fire-protection-rated glazing and complying with 16 CFR 1201 test requirements for Category II without the use of a surface-

applied film.

1. 20-Minute Fire Doors: Hose stream test is not required.
2. Products:
  - a. O'Keeffe's Inc. SAFTI Division; SAFTIFIRST.
  - b. SCHOTT North America Inc; Pyran Star L (laminated) Fire Rated Ceramic Glass.
  - c. Vetrotech Saint-Gobain North America;.

#### **2.04 SEALED INSULATING GLASS UNITS**

- A. Manufacturers:
  1. Any of the manufacturers specified for float glass.
- B. Sealed Insulating Glass Units: Types as indicated, Double pane.
  1. Locations: Exterior, except as otherwise indicated.
  2. Durability: Certified by an independent testing agency to comply with ASTM E 2190.
  3. Edge Spacers: Aluminum, bent and soldered corners.
  4. Edge Seal: Glass to elastomer with supplementary silicone sealant.
  5. Purge interpane space with dry hermetic air.

#### **2.05 GLAZING COMPOUNDS**

- A. Manufacturers:
  1. Bostik Inc: [www.bostik-us.com](http://www.bostik-us.com).
  2. Momentive Performance Materials, Inc (formerly GE Silicones): [www.momentive.com](http://www.momentive.com).
  3. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
- B. Butyl Sealant (Type to suit): Single component; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; Shore A hardness of 10 to 20; black color; non-skinning.

#### **2.06 GLAZING ACCESSORIES**

- A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) x width of glazing rabbet space minus 1/16 inch (1.5 mm) x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch (75 mm) long x one half the height of the glazing stop x thickness to suit application, self-adhesive on one face.
- C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.
  1. Manufacturers:
    - a. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
    - b. Tremco Global Sealants: [www.tremcosealants.com](http://www.tremcosealants.com).
    - c. Substitutions: Refer to Section 01 60 00 - Product Requirements.
- D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

#### **3.02 PREPARATION**

- A. Prime surfaces scheduled to receive sealant.
- B. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.
- C. Install sealant in accordance with manufacturer's instructions.

#### **3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)**

- A. Place setting blocks at 1/4 points with edge block no more than 6 inches (150 mm) from corners.

- B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

#### **3.04 CLEANING**

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

#### **3.05 PROTECTION**

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

**END OF SECTION**

**SECTION 26 32 13**  
**ENGINE GENERATORS**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. This Section includes packaged engine-generator sets for standby power supply with the following features:
1. Natural gas engine.
  2. Unit-mounted forced air cooling system.
  3. Unit-mounted control and monitoring.
  4. Sound Attenuated Weatherproof Enclosure
  5. Critical Silencer.
- B. Related Sections include the following:
1. Division 26 Section "Transfer Switches" for transfer switches including sensors and relays to initiate automatic-starting and stopping signals for engine-generator sets.

**1.03 SUBMITTALS**

- A. Product Data: For each type of packaged engine generator indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. In addition, include the following:
1. Thermal damage curve for generator.
  2. Time-current characteristic curves for generator protective device.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
1. Dimensioned outline plan and elevation drawings of engine-generator set and other components specified.
  2. Vibration Isolation Base Details: Signed and sealed by a qualified professional engineer. Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include base weights.
  3. Wiring Diagrams: Power, signal, and control wiring.
- C. Manufacturer Seismic Qualification Certification: Submit certification that engine-generator set, batteries, battery racks, accessories, and components will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems." Include the following:
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.  

The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
  2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

- D. Source quality-control test reports.
  1. Certified summary of prototype-unit test report.
  2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.
  3. Certified Summary of Performance Tests: Certify compliance with specified requirement to meet performance criteria for sensitive loads.
  4. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
  5. Report of sound generation.
  6. Report of exhaust emissions showing compliance with applicable regulations.
  7. Certified Torsional Vibration Compatibility: Comply with NFPA 110.
- E. Field quality-control test reports.
- F. Warranty: Special warranty specified in this Section.

**1.04 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For packaged engine generators to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
  1. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.

**1.05 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  1. Fuses: One for every 10 of each type and rating, but no less than one of each.
  2. Indicator Lamps: Two for every six of each type used, but no fewer than two of each.
  3. Filters: One set each of lubricating oil, fuel, and combustion-air filters.

**1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
  1. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
  2. Engineering Responsibility: Preparation of data for vibration isolators and seismic restraints of engine skid mounts, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Source Limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with ASME B15.1.
- E. Comply with NFPA 20.
- F. Comply with NFPA 37.
- G. Comply with NFPA 70.
- H. Comply with NFPA 99.
- I. Comply with NFPA 110 requirements for Level 2 emergency power supply system.
- J. Comply with UL 2200.

- K. Engine Exhaust Emissions: Comply with applicable state and local government requirements.
- L. Noise Emission: Comply with applicable state and local government requirements for maximum noise level at adjacent property boundaries due to sound emitted by generator set including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation.

#### **1.07 PROJECT CONDITIONS**

- A. Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:
  - 1. Ambient Temperature: Minus 15 to plus 40 deg C.
  - 2. Relative Humidity: 0 to 95 percent.
  - 3. Altitude: Sea level to 1000 feet.

#### **1.08 COORDINATION**

- A. The concrete mounting base for the generator shall be by the Electrical Contractor. Coordinate size and location of concrete base for the generator with the site contractor. Coordinate installation of power and control conduits and gas piping.

#### **1.9 WARRANTY**

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion including parts and labor for the entire 5 year period.

#### **1.10 MAINTENANCE SERVICE**

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of manufacturer's designated service organization. Include quarterly exercising to check for proper starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Provide parts and supplies same as those used in the manufacture and installation of original equipment.

### **PART 2 PRODUCTS**

#### **2.01 ENGINE-GENERATOR SET**

- A. Factory-assembled and -tested, engine-generator set.
- B. Mounting Frame: Maintain alignment of mounted components without depending on concrete foundation; and have lifting attachments.
  - 1. Rigging Diagram: Inscribed on metal plate permanently attached to mounting frame to indicate location and lifting capacity of each lifting attachment and generator-set center of gravity.
- C. Capacities and Characteristics:
  - 1. Output Connections: Three-phase, four wire.
  - 2. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component.
- D. Ratings:
  - 1. Capacity: 17 kW; 20 kVA @ 0.8 p.f.
  - 2. Voltage: 120/208 volts, 3 phase, 4 wire, wye configuration.

## 2.02 ENGINE

- A. Fuel: Natural gas.
- B. Ratings and Configuration:
  - 1. 2 cylinder, in-line configuration.
  - 2. 999 cc displacement.
- C. Lubrication System: The following items shall be mounted on engine or skid:
  - 1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
  - 2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
  - 3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.
- D. Engine Fuel System:
  - 1. Main Fuel Pump: Mounted on engine. Pump ensures adequate primary fuel flow under starting and load conditions.
  - 2. Relief-Bypass Valve: Automatically regulates pressure in fuel line and returns excess fuel to source.
- E. Governor: Adjustable isochronous, with speed sensing.
- F. Muffler/Silencer: Critical type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.
  - 1. Minimum sound attenuation of 25 dB at 500 Hz.
  - 2. Sound level measured at a distance of 10 feet from exhaust discharge after installation is complete shall be 76 dBA or less.
  - 3. Muffler location: Inside Enclosure
- G. Starting System: 12 volt, with negative ground.
  - 1. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
  - 2. Cranking Cycle: As required by NFPA 110 for system level specified
  - 3. Battery: Adequate capacity within ambient temperature range specified in Part 1 "Project Conditions" Article to provide specified cranking cycle at least three times without recharging.
  - 4. Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
  - 5. Battery Compartment: Factory fabricated of metal with acid-resistant finish and thermal insulation. Thermostatically controlled heater shall be arranged to maintain battery above 10 deg C regardless of external ambient temperature within range specified in Part 1 "Project Conditions" Article. Include accessories required to support and fasten batteries in place.
  - 6. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 100 A minimum continuous rating.
  - 7. Battery Charger: Current-limiting, automatic-equalizing and float-charging type. Unit shall comply with UL 1236 and include the following features:
    - Operation: Equalizing-charging rate of 10 A shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.

Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 40 deg C to plus 60 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.

Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.

Ammeter and Voltmeter: Flush mounted in door. Meters shall indicate charging rates.

Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.

Enclosure and Mounting: NEMA 250, Type 1, wall-mounted cabinet.

## **2.03 CONTROL AND MONITORING**

- A. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of generator set. When mode-selector switch is switched to the on position, generator set starts. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down generator set.
- B. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts generator set. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down generator set.
- C. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted on the generator set. Mounting method shall isolate the control panel from generator-set vibration.
- D. Indicating and Protective Devices and Controls: As required by NFPA 110 for Level 2 system, and the following:
  - 1. AC voltmeter.
  - 2. AC ammeter.
  - 3. AC frequency meter.
  - 4. DC voltmeter (alternator battery charging).
  - 5. Engine-coolant temperature gage.
  - 6. Engine lubricating-oil pressure gage.
  - 7. Running-time meter.
  - 8. Ammeter-voltmeter, phase-selector switch(es).
  - 9. Generator-voltage adjusting rheostat.
  - 10. Generator overload.
- E. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated.
- F. Connection to Data Link: A separate terminal block, factory wired to Form C dry contacts, for each alarm and status indication is reserved for connections for data-link transmission of indications to remote data terminals.
- G. Common Remote Audible Alarm: Comply with NFPA 110 requirements for Level 2 systems. Include necessary contacts and terminals in control and monitoring panel.
  - 1. Overcrank shutdown.

2. Coolant low-temperature alarm.
  3. Control switch not in auto position.
  4. Battery-charger malfunction alarm.
  5. Battery low-voltage alarm.
- H. Common Remote Audible Alarm: Signal the occurrence of any events listed below without differentiating between event types. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset.
1. Engine high-temperature shutdown.
  2. Lube-oil, low-pressure shutdown.
  3. Overspeed shutdown.
  4. Remote emergency-stop shutdown.
  5. Engine high-temperature prealarm.
  6. Lube-oil, low-pressure prealarm.
- I. Remote Alarm Annunciator: Comply with NFPA 99. An LED labeled with proper alarm conditions shall identify each alarm event and a common audible signal shall sound for each alarm condition. Silencing switch in face of panel shall silence signal without altering visual indication. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface or flush-mounting type to suit mounting conditions indicated.
- J. Remote Emergency-Stop Switch: Supplied in a break-glass type enclosure unless otherwise indicated; and labeled. Button shall be protected from accidental operation.

#### **2.04 GENERATOR OVERCURRENT AND FAULT PROTECTION**

- A. Primary Generator Circuit Breaker: Molded-case, adjustable electronic-trip type; 100 percent rated; complying with UL 489.
1. Tripping Characteristics: Adjustable long-time and short-time delay and instantaneous.
  2. Trip Settings: Selected to coordinate with generator thermal damage curve.
  3. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
  4. Mounting: Adjacent to or integrated with control and monitoring panel.
- B. Generator Protector: Microprocessor-based unit shall continuously monitor current level in each phase of generator output, integrate generator heating effect over time, and predict when thermal damage of alternator will occur. When signaled by generator protector or other generator-set protective devices, a shunt-trip device in the generator disconnect switch shall open the switch to disconnect the generator from load circuits. Protector shall perform the following functions:
1. Initiates a generator overload alarm when generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other generator-set malfunction alarms.
  2. Under single or three-phase fault conditions, regulates generator to 300 percent of rated full-load current for up to 10 seconds.
  3. As overcurrent heating effect on the generator approaches the thermal damage point of the unit, protector switches the excitation system off, opens the generator disconnect device, and shuts down the generator set.
  4. Senses clearing of a fault by other overcurrent devices and controls recovery of rated voltage to avoid overshoot.
- C. Ground-Fault Indication: Comply with NFPA 70, "Emergency System" signals for ground-fault. Integrate ground-fault alarm indication with other generator-set alarm indications.

#### **2.05 GENERATOR, EXCITER, AND VOLTAGE REGULATOR**

- A. Comply with NEMA MG 1.

- B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.
- C. Electrical Insulation: Class H or Class F.
- D. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.
- E. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.
- F. Enclosure: Dripproof.
- G. Instrument Transformers: Mounted within generator enclosure.
- H. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified.
  - 1. Adjusting rheostat on control and monitoring panel shall provide plus or minus 5 percent adjustment of output-voltage operating band.
- I. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.
- J. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

**2.06 OUTDOOR GENERATOR-SET ENCLOSURE: LEVEL 1 SOUND ATTENUATED**

- A. Description: Vandal-resistant, level 1 sound attenuated, weather protective steel housing, wind resistant up to 100 mph. Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Panels shall be removable by one person without tools. Instruments and control shall be mounted within enclosure.
- B. Description: Prefabricated or pre-engineered enclosure with the following features:
  - 1. Construction: Galvanized-steel, metal-clad, integral structural-steel-framed building erected on concrete foundation.
  - 2. Structural Design and Anchorage: Comply with ASCE 7 for wind loads.
  - 3. Louvers: Equipped with bird screen and filter arranged to permit air circulation when engine is not running while excluding exterior dust, birds, and rodents.
  - 4. Hinged Doors: With padlocking provisions.
  - 5. Ventilation: Louvers equipped with bird screen and filter arranged to permit air circulation while excluding exterior dust, birds, and rodents.
  - 6. Thermal Insulation: Manufacturer's standard materials and thickness selected in coordination with space heater to maintain winter interior temperature within operating limits required by engine-generator-set components.
- C. Engine Cooling Airflow through Enclosure: Maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for 2 hours with ambient temperature at top of range specified in system service conditions.
  - 1. Louvers: Fixed-engine, cooling-air inlet and discharge. Storm-proof and drainable louvers prevent entry of rain and snow.

**2.08 SOURCE QUALITY CONTROL**

- A. Prototype Testing: Factory test engine-generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.
  - 1. Tests: Comply with NFPA 110, Level 1 Energy Converters and with IEEE 115.
- B. Project-Specific Equipment Tests: Before shipment, factory test engine-generator set and other system components and accessories manufactured specifically for this Project. Perform tests at rated load and power factor. Include the following tests:

1. Test components and accessories furnished with installed unit that are not identical to those on tested prototype to demonstrate compatibility and reliability.
2. Full load run.
3. Maximum power.
4. Voltage regulation.
5. Transient and steady-state governing.
6. Single-step load pickup.
7. Safety shutdown.
8. Provide 14 days' advance notice of tests and opportunity for observation of tests by Owner's representative.
9. Report factory test results within 10 days of completion of test.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine areas, equipment bases, and conditions, with Owner and Engineer present, for compliance with requirements for installation and other conditions affecting packaged engine-generator performance.
- B. Examine roughing-in of piping systems and electrical connections. Verify actual locations of connections before packaged engine-generator installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.02 INSTALLATION**

- A. Comply with packaged engine-generator manufacturers' written installation and alignment instructions and with NFPA 37 & 110.
- B. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.
- C. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

#### **3.03 CONNECTIONS**

- A. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- B. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."
- C. Connect fuel, cooling-system, and exhaust-system piping adjacent to packaged engine generator to allow service and maintenance.

#### **3.04 IDENTIFICATION**

- A. Identify system components according to Division 26 Section "Identification for Electrical Systems."

#### **3.05 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.
- B. Perform tests and inspections and prepare test reports.
  1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
  1. Perform tests recommended by manufacturer and each electrical test and visual and mechanical inspection (except those indicated to be optional) for "AC Generators and

for Emergency Systems" specified in NETA Acceptance Testing Specification. Certify compliance with test parameters.

2. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here including, but not limited to, single-step full-load pickup test.
3. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.

Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.

Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.

Verify acceptance of charge for each element of the battery after discharge.

Verify that measurements are within manufacturer's specifications.

4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
  5. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine-generator system before and during system operation. Check for air, exhaust, and fluid leaks.
  6. Exhaust-System Back-Pressure Test: Use a manometer with a scale exceeding 40-inch wg. Connect to exhaust line close to engine exhaust manifold. Verify that back pressure at full-rated load is within manufacturer's written allowable limits for the engine.
  7. Exhaust Emissions Test: Comply with applicable government test criteria.
  8. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.
  9. Harmonic-Content Tests: Measure harmonic content of output voltage under 25 percent and at 100 percent of rated linear load. Verify that harmonic content is within specified limits.
  10. Noise Level Tests: Measure A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge, at four locations on the property line and compare measured levels with required values.
- D. Coordinate tests with tests for transfer switches and run them concurrently.
  - E. Test instruments shall have been calibrated within the last 12 months, traceable to standards of NIST, and adequate for making positive observation of test results. Make calibration records available for examination on request.
  - F. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
  - G. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
  - H. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  - I. Remove and replace malfunctioning units and retest as specified above.
  - J. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.
  - K. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.

### **3.06 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators.

END OF SECTION

**SECTION 26 36 00**  
**TRANSFER SWITCHES**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. This Section includes service entrance rated transfer switches rated 600 V and less.

**1.03 SUBMITTALS**

- A. Product Data: For each type of product indicated. Include rated capacities, weights, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings: Dimensioned plans, elevations, sections, and details showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.
- C. Manufacturer Seismic Qualification Certification: Submit certification that transfer switches accessories, and components will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems." Include the following:
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
    - a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
    - b. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
  - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
- D. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
  - 1. Features and operating sequences, both automatic and manual.
  - 2. List of all factory settings of relays; provide relay-setting and calibration instructions, including software, where applicable.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Maintain a service center capable of providing training, parts, and emergency maintenance repairs within a response period of less than eight hours from time of notification.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NEMA ICS 1.
- D. Comply with NFPA 70.
- E. Comply with NFPA 110.
- F. Comply with UL 1008 unless requirements of these Specifications are stricter.

## **PART 2 PRODUCTS**

### **2.01 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS**

- A. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.
- B. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.
  - 1. Where transfer switch includes internal fault-current protection, rating of switch and trip unit combination shall exceed indicated fault-current value at installation location.
- C. Solid-State Controls: Repetitive accuracy of all settings shall be plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.
- D. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.
- E. Electrical Operation: Accomplish by a nonfused, momentarily energized solenoid or electric-motor-operated mechanism, mechanically and electrically interlocked in both directions.
- F. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.
  - 1. Switch Action: Double throw; mechanically held in both directions.
  - 2. Contacts: Silver composition or silver alloy for load-current switching. Conventional automatic transfer-switch units, rated 225 A and higher, shall have separate arcing contacts.
- G. Neutral Terminal: Solid and fully rated, unless otherwise indicated.
- H. Factory Wiring: Train and bundle factory wiring and label, consistent with Shop Drawings, either by color-code or by numbered or lettered wire and cable tape markers at terminations. Color-coding and wire and cable tape markers are specified in Division 26 Section "Identification for Electrical Systems."
  - 1. Designated Terminals: Pressure type, suitable for types and sizes of field wiring indicated.
  - 2. Power-Terminal Arrangement and Field-Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
  - 3. Control Wiring: Equipped with lugs suitable for connection to terminal strips.
- I. Enclosures: General-purpose NEMA 250, Type 1, complying with NEMA ICS 6 and UL 508, unless otherwise indicated.

### **2.02 AUTOMATIC TRANSFER SWITCH**

- A. Comply with Level 1 equipment according to NFPA 110.
- B. Switching Arrangement: Double-throw type, incapable of pauses or intermediate position stops during normal functioning.
- C. Manual Switch Operation: Under load, with door closed and with either or both sources energized. Transfer time is same as for electrical operation. Control circuit automatically disconnects from electrical operator during manual operation.
- D. Signal-Before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval is adjustable from 1 to 30 seconds.
- E. Automatic Transfer-Switch Features:

1. Undervoltage Sensing for Each Phase of Normal Source: Sense low phase-to-ground voltage on each phase. Pickup voltage shall be adjustable from 85 to 100 percent of nominal, and dropout voltage is adjustable from 75 to 98 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.
  2. Adjustable Time Delay: For override of normal-source voltage sensing to delay transfer and engine start signals. Adjustable from zero to six seconds, and factory set for one second.
  3. Voltage/Frequency Lockout Relay: Prevent premature transfer to generator. Pickup voltage shall be adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency shall be adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.
  4. Time Delay for Retransfer to Normal Source: Adjustable from 0 to 30 minutes, and factory set for 10 minutes to automatically defeat delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.
  5. Test Switch: Simulate normal-source failure.
  6. Switch-Position Pilot Lights: Indicate source to which load is connected.
  7. Source-Available Indicating Lights: Supervise sources via transfer-switch normal- and emergency-source sensing circuits.
    - a. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
    - b. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."
  8. Unassigned Auxiliary Contacts: Two normally open, single-pole, double-throw contacts for each switch position, rated 10 A at 240-V ac.
  9. Engine Starting Contacts: One isolated and normally closed, and one isolated and normally open; rated 10 A at 32-V dc minimum.
  10. Engine Shutdown Contacts: Time delay adjustable from zero to five minutes, and factory set for five minutes. Contacts shall initiate shutdown at remote engine-generator controls after retransfer of load to normal source.
  11. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine generator and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods are adjustable from 10 to 30 minutes. Factory settings are for 7-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:
    - a. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.
    - b. Push-button programming control with digital display of settings.
    - c. Integral battery operation of time switch when normal control power is not available.
- F. Service Disconnect: The transfer switch shall be equipped with a line side circuit breaker rated at 100 amperes, with a minimum withstand rating of 22,000 A.I.C. The circuit breaker shall be suitable for use as a service entrance disconnect.
- G. Ratings: Transfer Switch shall have a minimum continuous current rating of 100 amperes at 120/208 volts, 3 phase, 4 wire.

## **2.03 SOURCE QUALITY CONTROL**

- A. Factory test and inspect components, assembled switches, and associated equipment. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Identify components according to Division 26 Section "Identification for Electrical Systems."
- B. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

### **3.02 CONNECTIONS**

- A. Wiring to Remote Components: Match type and number of cables and conductors to control and communication requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.
- B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- C. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

### **3.03 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.
- B. Perform tests and inspections and prepare test reports.
  - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installation, including connections, and to assist in testing.
  - 2. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.
  - 3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  - 4. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.
    - a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
    - b. Simulate loss of phase-to-ground voltage for each phase of normal source.
    - c. Verify time-delay settings.
    - d. Verify pickup and dropout voltages by data readout or inspection of control settings.
    - e. Test bypass/isolation unit functional modes and related automatic transfer-switch operations.
    - f. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.
- C. Coordinate tests with tests of generator and run them concurrently.
- D. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.
- E. Remove and replace malfunctioning units and retest as specified above.

### **3.04 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment as specified below. Refer to Division 01 Section "Demonstration and Training."

B. Coordinate this training with that for generator equipment.

END OF SECTION

## 20 kW

### GUARDIAN® SERIES Residential & Commercial Standby Generators Air-Cooled Gas Engine

**INCLUDES:**

- True Power™ Electrical Technology
- Two-Line LCD Multilingual Digital Evolution™ Controller (English/Spanish/ French /Portuguese)
- Electronic Governor
- System Status & Maintenance Interval LED Indicators
- Standard Wi-Fi™ Remote Monitoring
- Sound Attenuated Enclosure
- Flexible Fuel Line Connector
- Direct-To-Dirt Composite Mounting Pad
- Natural Gas or LP Gas Operation
- 5 Year Limited Warranty

● Listed and Labeled by the Southwest Research Institute allowing installation as close as 18" (457 mm) to a structure.\*  
\*Must be located away from doors, windows, and fresh air intakes and in accordance with local codes.

[https://assets.swri.org/library/DirectoryOfListedProducts/ConstructionIndustry/973\\_DoC\\_204\\_13204-01-01\\_Rev8.pdf](https://assets.swri.org/library/DirectoryOfListedProducts/ConstructionIndustry/973_DoC_204_13204-01-01_Rev8.pdf)

Standby Power Rating  
Model G007077-1 (Aluminum - Bisque) - 20 kW 60 Hz



## FEATURES

- **INNOVATIVE ENGINE DESIGN & RIGOROUS TESTING** are at the heart of Generac's success in providing the most reliable generators possible. Generac's G-Force engine lineup offers added peace of mind and reliability for when you need it the most. The G-Force series engines are purpose built and designed to handle the rigors of extended run times in high temperatures and extreme operating conditions.
- **TRUE POWER™ ELECTRICAL TECHNOLOGY:** Superior harmonics and sine wave form produce less than 5% Total Harmonic Distortion for utility quality power. This allows confident operation of sensitive electronic equipment and micro-chip based appliances, such as variable speed HVAC systems.
- **TEST CRITERIA:**
  - ✓ **PROTOTYPE TESTED**                      ✓ **NEMA MG1-22 EVALUATION**
  - ✓ **SYSTEM TORSIONAL TESTED**        ✓ **MOTOR STARTING ABILITY**
- **MOBILE LINK™ REMOTE MONITORING:** FREE with every Guardian Series Home standby generator. Allows you to monitor the status of your generator from anywhere in the world using a smartphone, tablet, or PC. Easily access information such as the current operating status and maintenance alerts. Connect your account to your authorized service dealer for fast, friendly and proactive service. With Mobile Link, you are taken care of before the next power outage.
- **SOLID-STATE, FREQUENCY COMPENSATED VOLTAGE REGULATION:** This state-of-the-art power maximizing regulation system is standard on all Generac models. It provides optimized FAST RESPONSE to changing load conditions and MAXIMUM MOTOR STARTING CAPABILITY by electronically torque-matching the surge loads to the engine. Digital voltage regulation at ±1%.
- **SINGLE SOURCE SERVICE RESPONSE** from Generac's extensive dealer network provides parts and service know-how for the entire unit, from the engine to the smallest electronic component.
- **GENERAC TRANSFER SWITCHES:** Long life and reliability are synonymous with GENERAC POWER SYSTEMS. One reason for this confidence is that the GENERAC product line includes its own transfer systems and controls for total system compatibility.

THE GENERAC PROMISE



\* Assembled in the USA using domestic and foreign parts.

**Engine**

- Generac G-Force design      Maximizes engine “breathing” for increased fuel efficiency. Plateau honed cylinder walls and plasma moly rings helps the engine run cooler, reducing oil consumption resulting in longer engine life.
- Quiet-Test™      Greatly reduces sound output and fuel consumption during bi-weekly exercise.
- “Spiny-lok” cast iron cylinder walls      Rigid construction and added durability provide long engine life.
- Electronic ignition/spark advance      These features combine to assure smooth, quick starting every time.
- Full pressure lubrication system      Pressurized lubrication to all vital bearings means better performance, less maintenance and longer engine life. Now featuring up to a 2 year/200 hour oil change interval.
- Low oil pressure shutdown system      Shutdown protection prevents catastrophic engine damage due to low oil.
- High temperature shutdown      Prevents damage due to overheating.

**Generator**

- Revolving field      Allows for a smaller, light weight unit that operates 25% more efficiently than a revolving armature generator.
- Skewed stator      Produces a smooth output waveform for compatibility with electronic equipment.
- Displaced phase excitation      Maximizes motor starting capability.
- Automatic voltage regulation      Regulates the output voltage to  $\pm 1\%$  prevents damaging voltage spikes.
- UL 2200 listed      For your safety.

**Evolution™ Controls**

- Two-line LCD multilingual display      Provides homeowners easily visible logs of history, maintenance and events up to 50 occurrences.
- Auto/Manual/Off illuminated buttons      Selects the operating mode and provides easy, at-a-glance status indication in any condition.
- Sealed, raised buttons      Smooth, weather-resistant user interface for programming and operations.
- Utility voltage sensing      Constantly monitors utility voltage, defaults 132 V dropout, 175 V pick up.
- Generator voltage sensing      Constantly monitors generator voltage to ensure the cleanest power delivered to the home.
- Utility interrupt delay      Prevents nuisance start-ups of the engine, adjustable 2-1500 seconds from the factory default setting of 5 seconds by a qualified dealer.
- Engine warm-up      Ensures engine is ready to assume the load, setpoint approximately 5 seconds.
- Engine cool-down      Allows engine to cool prior to shutdown, setpoint approximately 1 minute.
- Programmable exercise      Operates engine to prevent oil seal drying and damage between power outages by running the generator for 5 minutes every other week. Also offers a selectable setting for weekly or monthly operation providing flexibility and potentially lower fuel costs to the owner.
- Smart battery charger      Delivers charge to the battery only when needed at varying rates depending on outdoor air temperature. Compatible with lead acid and AGM-style batteries.
- Electronic governor      Maintains constant 60 Hz frequency.

**Unit**

- SAE weather protective enclosure      Sound attenuated enclosures ensure quiet operation and protection against mother nature, withstanding winds up to 150 mph. Hinged key locking roof panel for security. Lift-out front for easy access to all routine maintenance items. Electrostatically applied textured epoxy paint for added durability.
- Enclosed critical grade muffler      Quiet, critical grade muffler is mounted inside the unit to prevent injuries.
- Small, compact, attractive      Makes for an easy, eye appealing installation, as close as 18" away from a building.

**20 kW****Installation System**

- 1 ft (305 mm) flexible fuel line connector Absorbs any generator vibration when connected to rigid pipe.
- Direct-to-dirt composite mounting pad Complex lattice design prevents settling or sinking of the generator system.
- Integral sediment trap Prevents particles and moisture from entering the fuel regulator and engine, prolonging engine life.

**Remote Monitoring**

- Ability to view generator status Monitor your generator via your smartphone, tablet, or computer at any time via the Mobile Link application for complete peace of mind
- Ability to view generator Exercise/Run and Total Hours Review the generator's complete protection profile for exercise hours and total hours
- Ability to view generator maintenance information Provides maintenance information for your specific model generator when scheduled maintenance is due
- Monthly report with previous month's activity Detailed monthly reports provide historical generator information
- Ability to view generator battery information Built in battery diagnostics displaying current state of the battery

### Generator

<b>Model</b>	G007077-1
Rated Maximum Continuous Power Capacity (LP)	20,000 Watts*
Rated Maximum Continuous Power Capacity (NG)	17,000 Watts*
Rated Voltage	208
Rated Maximum Continuous Load Current – 208 Volts (LP/NG)	69.4/59.0
Total Harmonic Distortion	Less than 5%
Main Line Circuit Breaker	80 Amp
Phase	3
Number of Rotor Poles	2
Rated AC Frequency	60 Hz
Power Factor	0.8
Battery Requirement (not included)	12 Volts, Group 26R 540 CCA Minimum or Group 35AGM 650 CCA Minimum
Unit Weight (lb/kg)	466/211
Dimensions (L x W x H) in/mm	48 x 25 x 29/1218 x 638 x 732
Sound output in dB(A) at 23 ft (7 m) with generator operating at normal load**	67
Sound output in dB(A) at 23 ft (7 m) with generator in Quiet-Test™ low-speed exercise mode**	58
Exercise duration	5 min

### Engine

Type of Engine	GENERAC G-Force 1000 Series	
Number of Cylinders	2	
Displacement	999 cc	
Cylinder Block	Aluminum w/ Cast Iron Sleeve	
Valve Arrangement	Overhead Valve	
Ignition System	Solid-state w/ Magneto	
Governor System	Electronic	
Compression Ratio	9.5:1	
Starter	12 VDC	
Oil Capacity Including Filter	Approx. 1.9 qt/1.8 L	
Operating rpm	3,600	
Fuel Consumption		
Natural Gas - ft <sup>3</sup> /hr (m <sup>3</sup> /hr)	1/2 Load	219 (6.20)
	Full Load	307 (8.69)
Liquid Propane - ft <sup>3</sup> /hr (gal/hr) [l/hr]	1/2 Load	87 (2.39) [9.03]
	Full Load	130 (3.56) [13.48]

Note: **Fuel pipe must be sized for full load.** Required fuel pressure to generator fuel inlet at all load ranges - 3.5-7" water column (7-13 mm mercury) for natural gas, 10-12" water column (19-22 mm mercury) for LP gas. For BTU content, multiply ft<sup>3</sup>/hr x 2500 (LP) or ft<sup>3</sup>/hr x 1000 (NG). For Megajoule content, multiply m<sup>3</sup>/hr x 93.15 (LP) or m<sup>3</sup>/hr x 37.26 (NG)

### Controls

Two-Line Plain Text Multilingual LCD Display	Simple user interface for ease of operation.
Mode Buttons:Auto	Automatic Start on Utility failure. 7 day exerciser.
Manual	Start with starter control, unit stays on. If utility fails, transfer to load takes place.
Off	Stops unit. Power is removed. Control and charger still operate.
Ready to Run/Maintenance Messages	Standard
Engine Run Hours Indication	Standard
Programmable start delay between 2-1500 seconds	Standard (programmable by dealer only)
Utility Voltage Loss/Return to Utility Adjustable (Brownout Setting)	From 121-148 V/175-187 V
Future Set Capable Exerciser/Exercise Set Error Warning	Standard
Run/Alarm/Maintenance Logs	50 Events Each
Engine Start Sequence	Cyclic cranking: 16 sec on, 7 rest (90 sec maximum duration).
Starter Lock-out	Starter cannot re-engage until 5 sec after engine has stopped.
Smart Battery Charger	Standard
Charger Fault/Missing AC Warning	Standard
Low Battery/Battery Problem Protection and Battery Condition Indication	Standard
Automatic Voltage Regulation with Over and Under Voltage Protection	Standard
Under-Frequency/Overload/Stepper Overcurrent Protection	Standard
Safety Fused/Fuse Problem Protection	Standard
Automatic Low Oil Pressure/High Oil Temperature Shutdown	Standard
Overcrank/Overspeed (@ 72 Hz)/rpm Sense Loss Shutdown	Standard
High Engine Temperature Shutdown	Standard
Internal Fault/Incorrect Wiring Protection	Standard
Common External Fault Capability	Standard
Field Upgradable Firmware	Standard

\*\*Sound levels are taken from the front of the generator. Sound levels taken from other sides of the generator may be higher depending on installation parameters. Rating definitions - Standby: Applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. (All ratings in accordance with BS5514, ISO3046 and DIN6271). \* Maximum kilovolt amps and current are subject to and limited by such factors as fuel Btu/megajoule content, ambient temperature, altitude, engine power and condition, etc. Maximum power decreases about 3.5 percent for each 1,000 feet (304.8 meters) above sea level; and also will decrease about 1 percent for each 6 °C (10 °F) above 16 °C (60 °F).

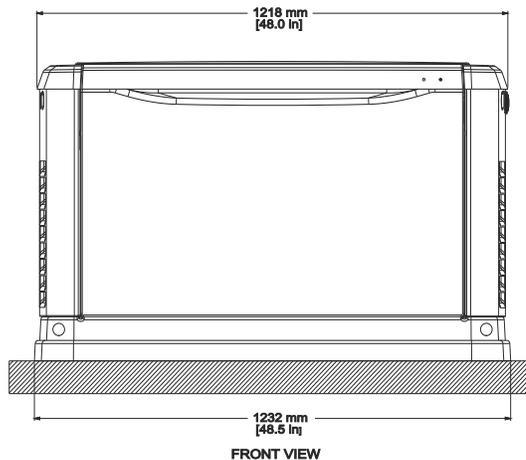
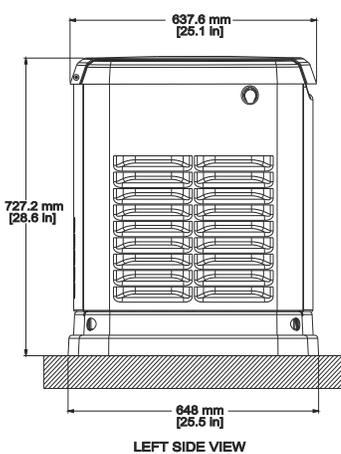
### 20 kW

Model #	Product	Description
G005819-0	26R Wet Cell Battery	Every standby generator requires a battery to start the system. Generac offers the recommended 26R wet cell battery for use with all air-cooled standby product.
G007101-0	Battery Pad Warmer	The pad warmer rests under the battery. Recommended for use if the temperature regularly falls below 0°F (-18°C). (Not necessary for use with AGM-style batteries).
G007102-0	Oil Warmer	Oil warmer slips directly over the oil filter. Recommended for use if the temperature regularly falls below 0°F (-18°C).
G007103-1	Breather Warmer	The breather warmer is for use in extreme cold weather applications. For use with Evolution controllers only in climates where heavy icing occurs.
G007027-0 - Bisque	Fascia Base Wrap Kit	The fascia base wrap snaps together around the bottom of the new air cooled generators. This offers a sleek, contoured appearance as well as offering protection from rodents and insects by covering the lifting holes located in the base.
G005703-0 - Bisque	Paint Kit	If the generator enclosure is scratched or damaged, it is important to touch-up the paint to protect from future corrosion. The paint kit includes the necessary paint to properly maintain or touch up a generator enclosure.
G006485-0	Scheduled Maintenance Kit	Generac's scheduled maintenance kits provide all the hardware necessary to perform complete routine maintenance on a Generac automatic standby generator.
G007005-0*	Wi-Fi LP Fuel Level Monitor	The Wi-Fi enabled LP fuel level monitor provides constant monitoring of the connected LP fuel tank. Monitoring the LP tank's fuel level is an important step in making sure your generator is ready to run during an unexpected power failure. Status alerts are available through a free application to notify when your LP tank is in need of a refill.

\*Only applicable for the United States.

## dimensions & UPCs

Dimensions shown are approximate. Refer to installation manual for exact dimensions. DO NOT USE THESE DIMENSIONS FOR INSTALLATION PURPOSES.

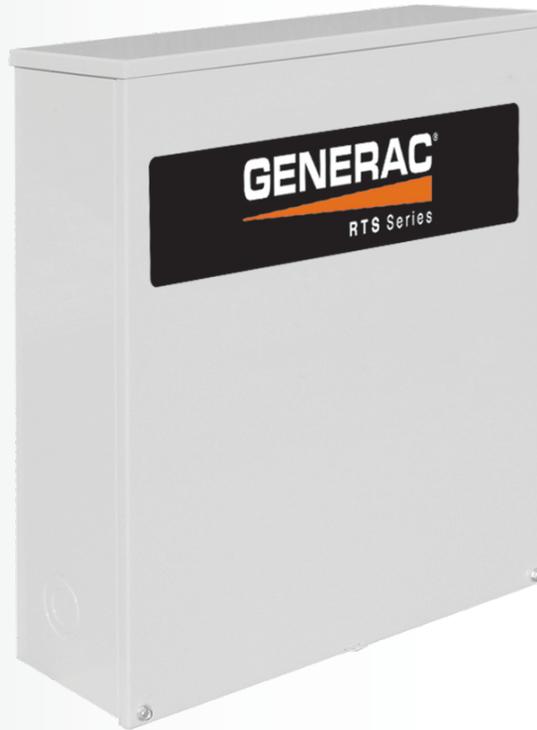


Model	UPC
G007077-1	696471074352

# GENERAC TRANSFER SWITCHES

## RTS Automatic Transfer Switch

100 - 400 Amps, 3-phase



### DESCRIPTION

Generac RTS automatic transfer switches are designed to operate with the digital control used on air-cooled generators and the Generac R200 or Nexus controller used on liquid-cooled QT series gaseous generators from 22 kW through 60 kW. The RTS transfer switch will operate only with the Generac R200 or Nexus controllers. The 100, 200 and 400 amp open transition switches are available in 3-phase configurations for 120/208 and 120/240 3 phase at 100, 200 and 400 amp ratings and 277/480 at the 100 and 200 amp rating.

### STANDARD FEATURES

All RTS transfer switches are housed in an aluminum NEMA/UL Type 3R enclosure, with electrostatically applied and baked powder paint. The Heavy Duty Generac Contactor is a UL recognized device, designed for years of service. The control at the generator handles all the timing, sensing and exercising functions.



## FUNCTIONS

All Timing and sensing functions originate in the generator controller

Utility voltage drop-out.....	<60%
Timer to generator start.....	15 seconds
Engine warm up delay.....	5 seconds
Standby voltage sensor.....	90%
Utility voltage pickup.....	>80%
Re-transfer time delay.....	15 seconds
Engine cool-down timer.....	60 seconds
Exerciser.....	15 minutes every 7 days

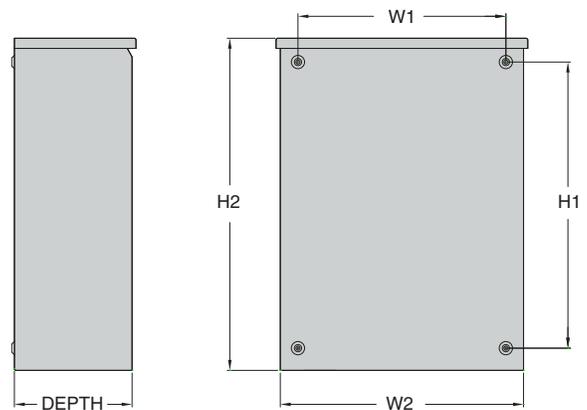
The transfer switch can be operated manually without power applied.

## SPECIFICATIONS

Amps	100					200					400				
Voltage	120/208, 3ø 120/240, 3ø 277/480, 3ø					120/208, 3ø 120/240, 3ø 277/480, 3ø					120/208, 3ø 120/240, 3ø				
Load Transition Type (Automatic)	Open Transition					Open Transition					Open Transition				
Enclosure Type	NEMA 3R					NEMA 3R					NEMA 3R				
Withstand Rating (Amps)	10,000 14,000 14,000					10,000 25,000 25,000					18,000				
Lug Range	2/0 - #14					400 MCM - #4					600 MCM - #4 or 2-250 MCM				
External Dimensions	Height		Width		Depth	Height		Width		Depth	Height		Width		Depth
	H1	H2	W1	W2		H1	H2	W1	W2		H1	H2	W1	W2	
120/208, 3ø	19.3	24.1	16.9	20.2	7.1	19.3	24.1	16.9	20.2	7.1	31.3	36.1	19.2	24.0	10.0
120/240, 3ø	19.3	24.1	16.9	20.2	7.1	19.3	24.1	16.9	20.2	7.1	31.3	36.1	19.2	24.0	10.0
277/480, 3ø	31.3	36.1	19.2	24.0	10.0	43.0	48.1	25.0	30.1	13.1					
Unit Weight (lbs.)	20					20					133				
	53					53					133				
	105					110									

## TRANSFER SWITCH FEATURES

- Electrically operated, mechanically-held contacts for fast, positive connections.
- Rated for all classes of load, 100% equipment rated, both inductive and resistive.
- 160 millisecond transfer time.
- Dual coil design.
- Main contacts are silver plated or silver alloy to resist welding and sticking.
- NEMA 3R (indoor/outdoor rated) aluminum enclosure is standard.





### The Kohler® Advantage

- **High Quality Power**  
Kohler home generators provide advanced voltage and frequency regulation along with ultra-low levels of harmonic distortion for excellent generator power quality to protect your valuable electronics.
- **Extraordinary Reliability**  
Kohler is known for extraordinary reliability and performance and backs that up with a premium 5-year or 2000 hour limited warranty.
- **Powerful Performance**  
Exclusive Powerboost™ technology provides excellent starting power. §
- **Aluminum Enclosure**
  - Attractive aluminum enclosure allows installation as close as 18 inches from your home or small business. †
  - Enclosure panels can be removed without tools to allow easy access for maintenance and service.

### Standard Features

- **RDC2 Controller**
  - One digital controller manages both the generator set and transfer switch functions (with optional Model RXT).
  - Electronic speed control responds quickly to varying demand.
  - OnCue® Plus Generator Management System for remote monitoring is included with the generator.
- **Kohler Command PRO Engine Features**
  - Kohler Command PRO® OHV engine with hydraulic valve lifters for reliable performance without routine valve adjustment or lengthy break-in requirements.
- **Designed for Easy Installation**
  - Sturdy aluminum base can be mounted on gravel or a concrete mounting pad.
  - Fuel and electrical connections through the enclosure wall eliminate the need for stub-ups through the base.
  - Customer connection terminal block located near the controller allows easy access for field wiring.
  - Designed for outdoor installation only.
- **Certifications**
  - Meets emission regulations for U.S. Environmental Protection Agency (EPA) with both natural gas and LPG.
  - UL 2200/cUL listed (60 Hz model).
  - CSA certification available (60 Hz model).
  - Accepted by the Massachusetts Board of Registration of Plumbers and Gas Fitters.
  - Meets 181 mph wind rating.
- Approved for stationary standby applications in locations served by a reliable utility source.
- 20RCAL models packaged with a Model RXT automatic transfer switch are available. See page 4 and the Model RXT ATS specification sheet.
- **Warranty**
  - 5-year/2000 hour limited warranty for on-grid (standby) applications in locations served by a reliable utility source.

### Generator Ratings

Alternator	Voltage	Phase	Hz	Standby Ratings				Line Circuit Breaker	
				Natural Gas		LPG		Amps	Poles
				kW/kVA	Amps	kW/kVA	Amps		
2F7	120/240	1	60	18/18	75	20/20	83	100	2
	120/208	3	60	17/21	58	17/21	58	70	3
2G7	120/240	3	60	17/21	51	17/21	51	60	3
	277/480	3	60	17/21	26	17/21	26	30	3

**Note:** The line circuit breaker is automatically selected based on the generator set model and voltage configuration.

RATINGS: Standby ratings apply to installations served by a reliable utility source. All single-phase units are rated at 1.0 power factor. The standby rating is applicable to variable loads with an average load factor of 80% for the duration of the power outage. No overload capacity is specified at this rating. Ratings are in accordance with ISO-3046/1, BS5514, AS2789, and DIN 6271. GENERAL GUIDELINES FOR DERATING: **ALTITUDE:** Derate 4% per 305 m (1000 ft.) elevation above 153 m (500 ft.). **TEMPERATURE:** Derate 2% per 5.5°C (10°F) temperature increase above 16°C (60°F). Availability is subject to change without notice. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler Co. generator distributor for availability.

§ Check the appliance manufacturer's specifications for actual power requirements. Consult a Kohler® Power Systems professional to calculate your exact residential power system requirements.

† Meets NFPA guidelines for 18 inch clearance to combustible materials. Check state and local codes for minimum distance required from a structure.

# Alternator Specifications

## Alternator Specifications

Specifications	Alternator
Manufacturer	Kohler
Type	2-Pole, Rotating Field
Leads, quantity	
2F7	4
2G7	12
Voltage regulator	Digital
Insulation:	NEMA MG1-1.66
Material	Class H
Temperature rise	130°C Standby
Bearing: quantity, type	1, Sealed
Coupling	Direct
Amortisseur windings	Full
Voltage regulation, no-load to full-load RMS	±1.0%
One-step load acceptance	100% of Rating
Peak motor starting kVA: (35% dip for voltages below)	
240 V, 1 ph	2F7 (4 lead)      41 (60 Hz)
240 or 480 V, 3 ph	2G7 (12 lead)      69 (60 Hz)

## Alternator Features

- Compliance with NEMA, IEEE, and ANSI standards for temperature rise.
- Self-ventilated and drip-proof construction.
- Windings are vacuum-impregnated with epoxy varnish for dependability and long life.
- Superior voltage waveform and minimum harmonic distortion from skewed alternator construction.
- Digital voltage regulator with ±1.0% no-load to full-load RMS regulation.
- Rotating-field alternator with static exciter for excellent load response.
- Total harmonic distortion (THD) from no load to full load with a linear load is less than 5%.

## Application Data

### Engine

Engine Specifications	
Manufacturer	Kohler
Engine: model, type	CH1000 4-Cycle
Cylinder arrangement	V-2
Displacement, cm <sup>3</sup> (cu. in.)	999 (61)
Bore and stroke, mm (in.)	90 x 78.5 (3.54 x 3.1)
Compression ratio	8.8:1
Main bearings: quantity, type	2, Parent Material
Rated RPM	
60 Hz	3600
Max. engine power at rated rpm, kW (HP)	
LPG, 60 Hz	23.0 (30.9)
Natural gas, 60 Hz	20.2 (27.1)
Cylinder head material	Aluminum
Valve material	Steel/Stellite®
Piston type and material	Aluminum Alloy
Crankshaft material	Heat Treated, Ductile Iron
Governor: type	Electronic
Frequency regulation, no load to full load	Isochronous
Frequency regulation, steady state	±0.5%
Air cleaner type	Dry

### Engine Electrical

Engine Electrical System	
Ignition system	Electronic, Capacitive Discharge
Starter motor rated voltage (DC)	12
Battery (purchased separately):	
Ground	Negative
Volts (DC)	12
Battery quantity	1
Recommended cold cranking amps: (CCA) rating for -18°C (0°F)	500
Group size	51

### Exhaust

Exhaust System	
Exhaust temperature exiting the enclosure at rated kW, dry, °C (°F)	260 (500)

### Lubrication

Lubricating System	
Type	Full Pressure
Oil capacity (with filter), L (qt.)	1.9 (2.0)
Oil filter: quantity, type	1, Cartridge
Oil cooler	Integral
Kohler recommends the use of Kohler Genuine oil and filters.	

### Fuel Pipe Size

Minimum Gas Pipe Size Recommendation, in. NPT			
Pipe Length, m (ft.)	Natural Gas 281,000 Btu/hr.	LPG 340,000 Btu/hr.	
8 (25)	1	3/4	
15 (50)	1	1	
30 (100)	1 1/4	1	
46 (150)	1 1/4	1 1/4	
61 (200)	1 1/4	1 1/4	

## Fuel Requirements

Fuel System	
Fuel types	Natural Gas or LPG
Fuel supply inlet	1/2 NPT
Fuel supply pressure, kPa (in. H <sub>2</sub> O):	
Natural gas	0.9- 2.7 (3.5-11)
LP	1.7- 2.7 (7-11)

Fuel Composition Limits *	Nat. Gas	LPG
Methane, % by volume (minimum)	90 min.	—
Ethane, % by volume (maximum)	4.0 max.	—
Propane, % by volume	1.0 max.	85 min.
Propene, % by volume (maximum)	0.1 max.	5.0 max.
C <sub>4</sub> and higher, % by volume	0.3 max.	2.5 max.
Sulfur, ppm mass (maximum)	25 max.	
Lower heating value, MJ/m <sup>3</sup> (Btu/ft <sup>3</sup> ), (minimum)	33.2 (890)	84.2 (2260)

\* Contact your local distributor for suitability and rating derates based on fuel compositions outside these limits.

## Operation Requirements

Fuel Consumption, m <sup>3</sup> /hr. (cfh) @ 60Hz		
% Load	Natural Gas	LPG
100	8.0 (281)	3.9 (136)
75	6.9 (243)	3.1 (109)
50	4.6 (161)	2.3 (82)
25	3.6 (127)	1.7 (59)
Exercise	2.0 (71)	1.0 (35)

Nominal fuel rating: Natural gas: 37 MJ/m<sup>3</sup> (1000 Btu/ft.<sup>3</sup>)  
LPG: 93 MJ/m<sup>3</sup> (2500 Btu/ft.<sup>3</sup>)

LPG conversion factors: 8.58 ft.<sup>3</sup> = 1 lb.  
0.535 m<sup>3</sup> = 1 kg  
36.39 ft.<sup>3</sup> = 1 gal.

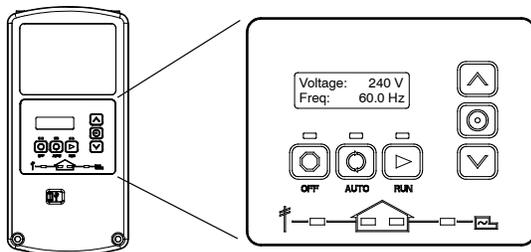
## Generator Set Sound Data

Model 20RCA 8 point logarithmic average sound levels are 64 dB(A) during weekly engine exercise and 69 dB(A) during full-speed generator diagnostics and normal operation.\*

All sound levels are measured at 7 meters with no load.

\* Lowest of 8 points measured around the generator. Sound levels at other points around generator may vary depending on installation parameters.

## RDC2 Controller



The RDC2 controller provides integrated control for the generator set, Kohler® Model RXT transfer switch, programmable interface module (PIM), and load shed kit.

### RDC2 Controller Features

- Membrane keypad:
  - OFF, AUTO, and RUN pushbuttons
  - Select and arrow buttons for access to system configuration and adjustment menus
- LED indicators for OFF, AUTO, and RUN modes

- LED indicators for utility power and generator set source availability and ATS position (Model RXT transfer switch required)
- LCD display:
  - Two lines x 16 characters per line
  - Backlit display with adjustable contrast for excellent visibility in all lighting conditions
- Scrolling system status display:
  - Generator set status
  - Voltage and frequency
  - Engine temperature
  - Oil pressure
  - Battery voltage
  - Engine runtime hours
- Date and time displays
- Smart engine cooldown senses engine temperature
- Digital isochronous governor maintains steady-state speed at all loads
- Digital voltage regulation: ± 1.0% RMS no-load to full-load
- Automatic start with programmed cranking cycle
- Programmable exerciser can be set to start automatically on any future day and time, and run every week or every two weeks
- Exercise modes:
  - Unloaded weekly exercise with complete system diagnostics
  - Unloaded full-speed exercise
  - Loaded full-speed exercise (Model RXT ATS required)
- Front-access mini USB connector for SiteTech™ or USB Utility connection
- Integral Ethernet connector for Kohler® OnCue® Plus
- Built-in 2.5 amp battery charger
- Remote two-wire start/stop capability for optional connection of a Model RDT transfer switch
- Diagnostic messages: Displays diagnostic messages for the engine, generator, Model RXT transfer switch, programmable interface module (PIM), and load management device.
- Maintenance reminders
- System settings:
  - System voltage, frequency, and phase
  - Voltage adjustment
  - Measurement system, English or metric
- ATS status (Model RXT ATS required):
  - Source availability
  - ATS position (normal/utility or emergency/generator)
  - Source voltage and frequency
- ATS control (Model RXT ATS required):
  - Source voltage and frequency settings
  - Engine start time delay
  - Transfer time delays
  - Voltage calibration
  - Fixed pickup and dropout settings
- Programmable Interface Module (PIM) status displays:
  - Input status (active/inactive)
  - Output status (active/inactive)
- Load control menus:
  - Load status
  - Test function

## Generator Set Standard Features

- Battery cables
- EPA certified fuel system
- Aluminum sound enclosure
- Critical silencer
- Field-connection terminal block
- Fuel solenoid valve and secondary regulator
- Line circuit breaker
- Multi-fuel system, LPG/natural gas, field-convertible
- Oil drain extension with shutoff valve
- OnCue® Plus Generator Management System
- Premium 5-year limited warranty
- RDC2 generator set/ATS controller
- Rodent-resistant construction
- Sound-deadening, flame-retardant foam per UL 94, class HF-1

## Available Options

### Approvals and Listings

- CSA approval

### Communication Accessories

- OnCue® Plus Wireless Generator Management System

### Concrete Mounting Pads

- Concrete mounting pad, 3 in. thick
- Concrete mounting pad, 4 in. thick (recommended for storm-prone areas)

### Electrical Accessories

- Battery
- Battery heater, 120VAC
- Battery heater, 240VAC
- Cold weather package, 120VAC
- Cold weather package, 240VAC
- Emergency stop kit
- PowerSync® Automatic Paralleling Module (APM) (single phase only; parallel two 20kW residential generator sets with the RDC2 controller)
- Programmable interface module (PIM) (provides 2 digital inputs and 6 relay outputs)

### Fuel System Accessories

- Flexible fuel line (included on QS models)
  - Carburetor heater, 120 VAC
  - Carburetor heater, 240 VAC
- Carburetor heater is recommended for reliable starting at temperatures below 0°C (32°F)

### Literature

- General maintenance literature kit
- Overhaul literature kit
- Production literature kit

### Maintenance

- Maintenance kit (includes air filter, oil, oil filter, and spark plugs)

## Automatic Transfer Switches and Accessories

- Model RDT ATS
- Model RXT ATS
- Model RXT ATS with combined interface/load management board
- Load shed kit for RXT or RDT
- Power relay modules (use up to 4 relay modules for each load management device)
- Other Kohler® ATS

## 20RCAL Model Packages

- 20RCAL with 100 amp RXT with 16-space load center and NEMA 1 steel enclosure for indoor installation
- 20RCAL with 200 amp service entrance-rated Model RXT with combined interface/load management board and corrosion-resistant NEMA 3R aluminum enclosure

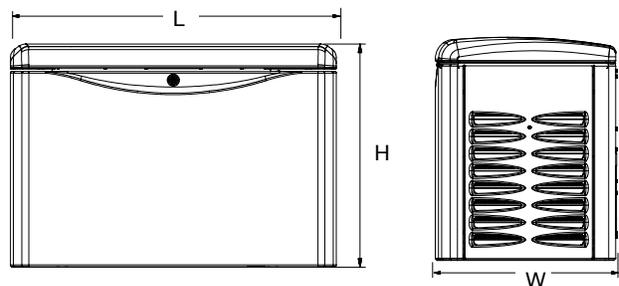
## Warranty

- 5- Year Comprehensive Limited Warranty
- 10- Year Comprehensive Limited Warranty

## Generator Set Dimensions and Weights

Generator Set Size, L x W x H: 1193 x 666 x 817 mm (47 x 26.2 x 32.2 in.)

Shipping Weights:  
 20RCA Generator Set: 252 kg (555 lb.)  
 20RCAL with 100 A RXT ATS w/LC: 277 kg (611 lbs.)  
 20RCAL with 200 A RXT SE ATS: 272 kg (600 lb.)



NOTE: Dimensions are provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

## DISTRIBUTED BY:



### Available Models

- 100, 200, and 400 amp standard and service entrance models are available.
- 150 and 300 amp service entrance models are also available.
- Combined interface/load management board is available on single-phase standard and service entrance models. (Not available on 3-phase or load center models.)
- 100 amp standard single-phase models are available with or without a 16-space load center. Up to 8 tandem breakers can be used for a total of 24 circuits.
- 100 amp standard single phase model with a 12-space load center and a NEMA 1 enclosure is available as a standalone non-configurable spec (GM85273-SA\_).
- See page 7 for more information.

### Model RXT Automatic Transfer Switch

The Model RXT automatic transfer switch is designed for use only with Kohler® generator sets equipped with the RDC2 generator set/transfer switch controller. The transfer switch operation is controlled by the RDC2 controller.

### Standard Features

- Allows utility voltage display on the RDC2 generator set/transfer switch controller, available exclusively on Kohler® residential and light commercial generator sets
- UL listed
  - UL 1008 listed, file # E58962
  - Models with load centers use UL 67 listed components
- CSA certification, file # LR58301, is available for:
  - Standard ATS without load center (single and three-phase)
  - Service entrance ATS 100, 200, 300, and 400 amp models
- Corrosion-resistant NEMA 3R aluminum enclosure
  - Padlockable
  - Approved for indoor or outdoor installation
  - ANSI 49 gray
- NEMA 1 enclosure available on 100 amp load center models
- Contactor electrically and mechanically interlocked
- Double throw inherently interlocked design
- Contactor manually operable for maintenance purposes
- Silver alloy main contacts
- Transfer switches are 100% equipment rated and can be applied at the rated current without derating (non-service entrance models)
- Service entrance models include disconnect circuit breaker on the utility (normal) source side (80% rated)
- Five-year limited warranty

### Standard Interface Board

- Standard interface board connects to the Model RDC2 generator set/transfer switch controller.
- Includes a load control contact that provides a 5 minute time delay for startup of selected loads after transfer to the emergency source. Use for large motor loads.

### Combined Interface/Load Management Board

- Optional combined interface/load management board replaces the standard interface board and connects to the Model RDC2 generator set/transfer switch controller.
- The combined board is available on single-phase standard and service entrance models. (Not available on 3-phase or load center models.)
- The combined board automatically manages up to six residential loads:
  - Up to four customer-supplied power relay modules can be connected for management of non-essential secondary loads.
  - Two HVAC relays are included for control of two independent air conditioner loads.

# Codes and Standards

The ATS meets or exceeds the requirements of the following specifications:

- Underwriters Laboratories UL 1008, Standard for Automatic Transfer Switches for Use in Emergency Systems, file #E58962
- Underwriters Laboratories UL 508, Standard for Industrial Control Equipment
- CSA certification available, file #LR58301 (not available for 150, 300, or 400 amp service entrance or 100 amp load center models). Must be selected when the transfer switch is ordered.
- NFPA 70, National Electrical Code
- NFPA 110, Emergency and Standby Power Systems
- NEMA Standard IC10- 1993, AC Automatic Transfer Switches

## Specifications

Standard Interface Board	
Controller interface connections A and B	#20 AWG shielded twisted-pair Belden 9402 or 8762 or equivalent
Controller interface connections PWR and COM	#12- 20 AWG (see ATS Installation Manual)
Load control contact rating	10 A @ 250 VAC
Load control connections	#12- 18 AWG

**Note:** For combined interface/load management board specifications, see page 3.

Environmental Specifications	
Operating temperature	- 20°C to 70°C (- 4°F to 158°F)
Storage temperature	- 40°C to 85°C (- 40°F to 185°F)
Humidity	5 to 95% noncondensing

Contact Ratings	
Engine start	10 A @ 32 VDC SPST normally closed (NC)
Load control	10 A @ 125 VAC SPST normally open (NO)

Auxiliary Position-Indicating Contacts		
Model	Number of contacts Normal, Emergency	Contact Rating
100- 200A 1 Ph	1, 1 Optional	15 A @ 250VAC
100- 200 A 1 Ph SE	1, 1 Optional	15 A @ 250VAC
300- 400 A 1 Ph SE	2, 2 Standard 1, 1 Optional	10 A @ 480 VAC
400 A 1 Ph and 3Ph/3P	2, 2 Standard 1, 1 Optional	10 A @ 480 VAC
400 A 3Ph/4P	8, 8 Standard	10 A @ 480 VAC

Cable Sizes						
AL/CU UL-Listed Solderless Screw-Type Terminals for External Power Connections						
Switch Size, Amps	Switch	Ph.	Range of Wire Sizes, Cu/Al			
			Normal (per phase)	Emergency and Load (per phase)	Neutral	Ground
100	Standard	1	(1) #14 - 1/0 AWG	(1) #14 - 1/0 AWG	(5) #12 - 250 KCMIL (Cu) or (5) #10 - 250 KCMIL (Al)	(9) #6 - #14 AWG or (4) #14 - 1/0 AWG
	12- or 16-space load center (NEMA 1)	1	(1) #14 - 1/0 AWG	Emerg: (1) #14 - 1/0 AWG  Load: per customer-supplied circuit breaker	(26) #4 - 14 AWG or (2) #14 - 1/0 AWG or (1) #6 - 2/0 AWG	
	16-space load center (NEMA 3R)	1	(1) #14 - 1/0 AWG		(26) #4 - 14 AWG or (2) #14 - 1/0 AWG or (1) 2/0 AWG	
	Service Entrance	1	(1) #12 - 2/0 AWG	(1) #14 - 1/0 AWG	(5) #12 - 250 KCMIL (Cu) or (5) #10 - 250 KCMIL (Al)	
	3-Phase	3	(1) #14 - 4/0 AWG	(1) #14 - 4/0 AWG	(3) #14 - 1/0 AWG	
150 200	Service Entrance	1	(1) #4 - 300 KCMIL	(1) #6 - 250 KCMIL	(5) #12 - 250 KCMIL (Cu) or (5) #10 - 250 KCMIL (Al)	(6) #6 - 3/0 AWG
200	Standard	1	(1) #6 AWG - 250 KCMIL	(1) #6 - 250 KCMIL	(5) #12 - 250 KCMIL (Cu) or (5) #10 - 250 KCMIL (Al)	
	3-Phase	3	(1) #14 - 4/0 AWG	(1) #14 - 4/0 AWG	(3) #14 - 1/0 AWG	
300 400	Service Entrance	1	(1) #1 - 600 KCMIL or (2) #1 - 250 KCMIL	(2) 1/0 - 250 KCMIL or (1) #4 - 600 KCMIL	(12) 1/0 - 250 KCMIL or (6) #4 AWG - 600 KCMIL	
400	Standard	1	(1) #4 - 600 KCMIL or (2) 1/0 - 250 KCMIL	(1) #4 - 600 KCMIL or (2) 1/0 - 250 KCMIL	(3) #4 AWG - 600 KCMIL or (6) 1/0 AWG - 250 KCMIL	
		3				

**Note:** Data is subject to change. Refer to the transfer switch dimension drawings and wiring diagrams for planning and installation.

# Optional Combined Interface/Load Management Board

The RXT transfer switch is available with either a standard interface board or a combined interface/load management board. The combined board allows load management as described below.

## Load Management

- The combined load management board disconnects non-critical loads to prevent generator overload, in compliance with NEC.
- The combined load management board monitors generator current and frequency to determine when to add or shed loads. This monitoring prevents frequency drops that can damage valuable electronics like computers and televisions.
- Load management allows the use of a smaller generator set.

## Operation

- Loads are automatically added or shed based on generator capacity.
- The load control system uses dynamic logic to prevent shedding important loads unnecessarily when air conditioning, refrigerator, or water pump motors start (patent pending).
- The load management board and generator communicate to provide smart power management. The time to shed loads decreases as each load is shed to quickly adapt to critical power requirements.
- Load shed power level and frequency setpoints can be adjusted using a personal computer (laptop) and Kohler® SiteTech™ software, which is only available to Kohler-authorized distributors and dealers.

## Priority Setting

- Loads are added and shed according to their priority. Load 1 is the top priority, which is added first and shed last. Load 6 is the lowest priority.
- Less critical loads can be turned off automatically when essential appliances are running.
- Load priorities are hard-wired at installation.

## Viewing Load Shed Outputs with OnCue® Plus

- Use Kohler's OnCue® Plus Generator Management System (sold separately) to view load status (On or Off) for loads connected to the load shed relays.
- Use OnCue® Plus to remotely monitor when loads are shed or added.
- The load shed outputs can be labeled in OnCue® Plus.

## Current Transformer

- The combined load management board option includes a 400 amp current transformer (CT) for load monitoring.
- A larger diameter CT is available for applications that require larger cables.
- A 500 amp CT is available for use with a 60RCL generator.
- See the table below for current transformer specifications and optional kit numbers.

## Load Shed Specifications

Connection	Rating	Connection
Pilot Relays*	125VAC, 10 A total (general purpose) 120VAC, 125VA (pilot duty)	#12- 20 AWG
HVAC Relays (qty. 2)	125VAC, 10 A (general purpose) 120VAC, 125VA (pilot duty)	#12- 20 AWG
RBUS Communication and Power Connections to the RDC2 controller	0.5 A @ 12 VDC	Use Belden #9402 or equivalent 20 AWG shielded, twisted-pair communications cable †
* Four (4) pilot relays are provided for customer-supplied normally closed load-switching contactors/relays. The combination of four load relay outputs cannot exceed 10 amps total current draw. Kohler® power relay modules are recommended.		
† For long distances, use an equivalent shielded, twisted-pair cable for RBUS connections and individual 12- 20 AWG wires (qty. 2) for power connections.		

## Current Transformer Specifications

Ratio (Amps:VAC)	Outer Diameter mm (in.)	Inner Diameter mm (in.)	Service Part Number	Sales Kit Part Number	CT Availability
400:3	63.5 (2.5)	28.7 (1.13)	GM83929	N/A	Included with combined board
400:3	111.8 (4.4)	57.2 (2.25)	GM17250	GM17250-KP1-QS	Sold Separately
500:3	171.5 (6.75)	108.0 (4.25)	GM60264	GM17250-KP2-QS	Sold Separately (use with 60RCL)

# Withstand and Close-On Ratings (WCR)

## Service Entrance Transfer Switch Ratings

The service entrance transfer switch is factory-equipped with a normal source disconnect circuit breaker.

Suitable for the control of motors, electric discharge lamps, tungsten filament lamps and electric heating equipment where the sum of motor full-load ampere ratings and the ampere ratings of other loads do not exceed the ampere rating of the switch and the tungsten load does not exceed 30 percent of switch rating.

Switch Rating, Amps *	WCR, RMS Symmetrical Amps at 240 VAC
100, 150, 200	22,000
300, 400	35,000
* Continuous load current not to exceed 80% of switch rating.	

## Contactor Ratings with Coordinated Circuit Breakers

Single-phase transfer switches are UL listed at 240 VAC maximum. Three-phase transfer switches are rated at 480 VAC maximum. The following table lists contactor withstand current ratings (WCR) for 100- 400 ampere non-service entrance rated switches with specific manufacturer's circuit breakers per UL and Canadian safety standards. Suitable for the control of motors, electric discharge lamps, tungsten filament lamps and electric heating equipment where the sum of motor full-load ampere ratings and the ampere ratings of other loads do not exceed the ampere rating of the switch and the tungsten load does not exceed 30 percent of switch rating.

The transfer switch is rated for use on a circuit capable of delivering not more than the RMS symmetrical amperes maximum as shown in the tables below, but no greater than the interrupting capacity of the selected breaker.

WCR Ratings with Specific Manufacturer's Molded-Case Circuit Breakers							
Switch Rating, Amps	Voltage, max.	Number of Poles/ Phases	WCR, RMS Symmetrical Amps	Manufacturer	Type or Class	Maximum Size, Amps	
100	240	2 pole/ 1 phase	10,000	Any Breaker *	Any Breaker (0.025 seconds max.)	—	
100	240	3 phase	150,000	Square D	HR	250	
			125,000		HL	150	
			100,000		BJ, HJ	125	
			65,000		BG, HG	125	
			42,000		QG, QJ	125	
			25,000		HD	150	
	480		480	22,000	GE	THED	150
				85,000	Square D	HL, HR	150
				50,000		BJ	125
				35,000		HG, HJ	150
18,000	BG	125					
				BD, HD	125		
150 200	240	2 pole/ 1 phase	10,000	Any Breaker *	Any Breaker (0.025 seconds max.)	—	
200	240	3 phase	200,000	Square D	JR	250	
			125,000		JL	250	
			100,000		JJ	250	
			65,000		JG	250	
			42,000		QG, QJ	225	
			25,000		JD	250	
	480		480		85,000	JL, JR	250
					30,000	JG, JJ	250
					18,000	JD	250

\* For higher WCR values, contact the factory for additional specific breaker ratings.

**WCR Ratings with Specific Manufacturer's Molded-Case Circuit Breakers**

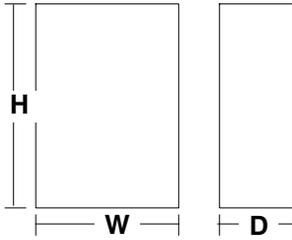
Switch Rating, Amps	Voltage, max.	Number of Poles/ Phases	WCR, RMS Symmetrical Amps	Manufacturer	Type or Class	Maximum Size, Amps
300 400	240	1 phase	65,000	GE	THLC4	350
	480		42,000	Eaton/Cutler Hammer	HMC	800
			42,000	GE	THKM3F	1200
400	240	3 pole/ 3 phase	65,000	GE	THLC4	350
	480		42,000	Eaton/Cutler Hammer	HMC	800
			42,000	GE	THKM3F	1200
	240	4 pole/ 3 phase	65,000	GE	THQMV	225
				GE	SGL1, SGL4, SGL6, SGP1, SGP4, SGP6	600
				Eaton/Cutler Hammer	LDC, CLDC, HLD, CHLD	600
				Square D	LJ, LL, LR	600
				Siemens/ITE	QG, QJ	250
	480	4 pole/ 3 phase	50,000	Eaton/Cutler Hammer	HLD6, HLXD6	600
					JGH, JGC, NHH	250
					HKD, CHKD, KDC, HKDB, CHKDB, LHH	400
					CHLD, LDC, CLDC, LGH*, LGC*, LGU*, LGX*	600
					MDL, CMDL, HMDL, CHMDL, NGS, NGH, NGC, MDLB, CMDLB, HMDLB, CHMDLB	800
					NGU	1600
				GE	TBC4	400
					TBC6, TJL4V, TJL1S-6S, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGN, FGH, FGL, FGP	600
					TBC8, TKL4V, TKH8S-12S, TKL8S-12S, SKH8, SKL8, SKP8, TB8	800
				Siemens/ITE	HFD6, HFXD6, HFG, LFG	250
					HJD6, HJXD6, SHJD6, HHJD6, HHJXD6, CJD6, SCJD6, HJG, LLG, LJG	400
					HLD6, HLXD6, SHLD6, HHLD6, HHLXD6, CLD6, SCLD6, HLG	600
LMD6, LMXD6, HLMD6, HLMXD6, MD6, MXD6, HMD6, HMXD6, SMD6, SHMD6, CMD6, SCMD6, HMG, LMG	800					
Square D	CK400N, CK400NN, CK400H, CK400HH, CJ400L, NSJ400	400				
	LC, DJ, DL, LJ, LL, LR, LI, NSJ600	600				
	CK800N, CK800NN, CK800H, CK800HH, MJ	800				
	CK1000HH	1000				
				PK, PJ, PL, MH, MasterPact STR 28D, CK1200HH	1200	

\* With Digitrip 310+ LS or LSG Inst. Override set to 12X.

## Dimensions and Weights

**Note:** Always use the transfer switch dimension drawing for planning and installation. Weights and dimensions may vary for different configurations. See the Operation/Installation Manual or your local distributor for dimension drawings.

**Note:** Transfer switch weights and dimensions shown in the table do not include packaging. **To estimate the shipping weight, add 3 kg (5 lbs.) or 10% (whichever is larger) to the weight shown.**



Amps	Description	Dimensions, H x W x D, mm (in.) †	Weight ‡ kg (lb.)	Dimension Drawing
100	Single phase	623 x 335 x 180 (24.5 x 13.2 x 7.1)	7 (15)	ADV-8688
	With 12-space load center (NEMA 1)	610 x 330 x 154 (24.0 x 13.0 x 6.0)	12 (26)	ADV-9186
	With 16-space load center (NEMA 1)	610 x 330 x 154 (24.0 x 13.0 x 6.0)	12 (26)	ADV-9187
	With 16-space load center	614 x 335 x 180 (24.2 x 13.2 x 7.1)	8 (18)	ADV-9188
	Three phase 3-pole	673 x 462 x 228 (26.5 x 18.2 x 9.0)	15 (33)	ADV-9755
	Three phase 4-pole	673 x 462 x 228 (26.5 x 18.2 x 9.0)	15 (33)	ADV-9755
	Service entrance (ASE)	734 x 416 x 175 (28.9 x 16.4 x 6.9)	10 (22)	ADV-9046
	Service entrance (CSE)	754 x 416 x 175 (29.7 x 16.4 x 6.9)	14 (30)	ADV-8797
150	Service entrance (ASE)	734 x 416 x 175 (28.9 x 16.4 x 6.9)	12 (26)	ADV-9046
200	Service entrance (ASE)	734 x 416 x 175 (28.9 x 16.4 x 6.9)	12 (26)	ADV-9046
	Service entrance (CSE)	754 x 416 x 175 (29.7 x 16.4 x 6.9)	16 (36)	ADV-8798
	Single phase	623 x 335 x 180 (24.5 x 13.2 x 7.1)	7 (15)	ADV-8688
	Three phase	673 x 462 x 228 (26.5 x 18.2 x 9.0)	15 (33)	ADV-9755
300	Service entrance	1452 x 629 x 329 (57.2 x 24.8 x 12.9)	59 (130)	ADV-9768
400	Single phase	1222 x 610 x 343 (48.1 x 24.0 x 13.5)	45 (100)	ADV-9756
	3-Pole	1222 x 610 x 343 (48.1 x 24.0 x 13.5)	47 (104)	ADV-9756
	4-Pole	1702 x 610 x 514 (67.0 x 24.0 x 20.2)	188 (414)	ADV-9757
	Service entrance	1452 x 629 x 329 (57.2 x 24.8 x 12.9)	59 (130)	ADV-9768

† Depth does not include the padlock hasp on the front of the enclosure.

‡ Transfer switch weights are approximate and do not include packaging.

**Note:** Enclosures are type NEMA 3R except as noted.

## Accessories

### Auxiliary position-indicating contacts

- Standard on 300-400 amp models, optional for others
- One closed on normal position and one closed on emergency position
- Form C contacts rated 15 A @ 250 VAC

### Power relay modules

- 50 amp DPST power relay mounted in a NEMA type 3R enclosure
- Use up to four modules with the combined interface/load management board
- UL/cUL listed
- Dimensions: 172 x 233 x 92 mm (6.8 x 9.2 x 3.6 in.)
- For more information, see specification sheet G6-143

### Status indicator kit for standard interface board

- LEDs indicate normal and emergency source availability and contactor position
- Mounts on the outside of the RXT enclosure
- View transfer switch status without removing enclosure cover
- An overhang on the enclosure protects the indicator panel and ribbon cable opening
- Dimensions: 92 mm x 42 mm (3.62 in. x 1.65 in.)
- Connects to the standard interface board only
- Not available for 400 amp/4 pole model
- For more information on the status indicator kit, see specification sheet G11-123

### Status indicator kit for combined interface/load management board

- LEDs indicate normal and emergency source availability and contactor position
- Dual color LEDs for each load indicate load status (powered or shed) and flash during a test
- Load shed test button allows the operator to cycle the load shed relays in order of priority (when generator is in RUN mode)
- Mounts on the outside of the RXT enclosure
- View transfer switch and load status without removing enclosure cover
- An overhang on the enclosure protects the indicator panel and ribbon cable opening
- Dimensions: 183 mm x 42 mm (7.20 in. x 1.65 in.)
- Connects to the combined interface/load management board only
- Not available for 400 amp/4 pole model
- For more information on the status indicator kit, see specification sheet G11-123

### Auxiliary circuit breaker (service entrance models only)

- Single-pole type QO circuit breaker
- Mounts on a bracket inside the enclosure
- 15 amp and 20 amp circuit breakers are available

## Available Models

All Model RXT transfer switches are standard-transition 60 Hz automatic transfer switches. Letters in parentheses refer to the model designation code described on the last page.

Amps	Description (Connections)	Voltages			Poles	Phases	WCR § RMS Symmetrical Amps
		208 (C)	240 (F)	480 (M)			
100	Standard (A)		•		2 (N)	1	10,000
	Standard, with 16-space load center (B) ¶		•		2 (N)	1	10,000
	Standard, with 12-space load center **		•		2 (N)	1	10,000
	Service entrance (ASE, CSE)		•		2 (N)	1	22,000
	Standard, 3-phase (A)	•	•	•	3 (T) or 4 (V)	3	10,000
150	Service entrance (ASE)		•		2 (N)	1	22,000
200	Standard (A)		•		2 (N)	1	10,000
	Service entrance (ASE, CSE)		•		2 (N)	1	22,000
	Standard, 3-phase (A)	•	•	•	3 (T) or 4 (V)	3	10,000
300	Service entrance (ASE, CSE)		•		2 (N)	1	35,000
400	Standard (A)		•		2 (N)	1	35,000
	Service entrance (ASE, CSE)		•		2 (N)	1	35,000
	Standard, 3-phase (A)	•	•	•	3 (T) or 4 (V)	3	42,000 @ 480V 65,000 @ 240 V

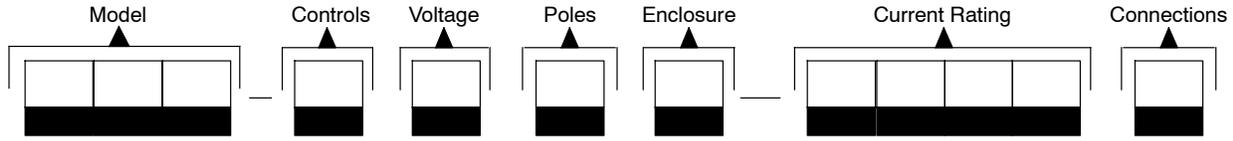
§ Withstand and close-on rating. See pages 3-5 for WCR information and specific breaker ratings.

¶ With 16-space load center and NEMA 1 or NEMA 3R enclosure. Up to 8 tandem breakers can be used, for a maximum of 24 circuits.

\*\* GM85273- SA\_ with 12-space load center and NEMA 1 enclosure.

**Note:** Combined interface board is available on single-phase standard or service entrance models. (Not available on 3-phase or load center models.)

## Model Designation



Record the transfer switch model designation in the boxes. The transfer switch model designation defines ratings and characteristics as explained below.

### Sample Model Designation: RXT-JFNC-0200A

#### Model

RXT: Kohler Automatic Transfer Switch

#### Controls

J: Interface for RDC2 Controller  
 (standard or combined interface/load management)

#### Voltage/Frequency

C: 208 Volts/60 Hz (3-phase only)  
 F: 240 Volts/60 Hz  
 M: 480 Volts/60 Hz (3-phase only)

#### Number of Poles/Wires

N: 2-pole, 3-wire, solid neutral (120/240 V only)  
 T: 3-pole, 4-wire, solid neutral  
 V: 4-pole, 4-wire, switched neutral

#### Enclosure

A: NEMA 1 \*  
 C: NEMA 3R

\* NEMA 1 enclosure is available on 100 amp load center models only.

#### Current Rating

0100: 100 amps                      0300: 300 amps  
 0150: 150 amps                    0400: 400 amps  
 0200: 200 amps

#### Connections

A: No load center  
 B: With load center (100 amp single-phase only)  
 ASE: Service entrance rated  
 CSE: Service entrance rated with CSA certification  
 (not available for 150 amp models)

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