**SECTION 26 36 24
AUTOMATIC TRANSFER CONTROL SYSTEM**

**PART 1 GENERAL**

## REFERENCES

### The following is a list of standards that may be referenced in this section:

#### Institute of Electrical and Electronics Engineers (IEEE):

##### C37.90.1, Standard for Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus.

##### C37.90.2, Standard for Withstand Capability of Relay Systems to radiated Electromagnetic Interference from Transceivers.

#### National Electrical Manufacturers Association (NEMA):

##### ICS 1, General Standards for Industrial Control and Systems: General Requirements.

##### ICS 2, Industrial Control and Systems Controllers, Contactors, and Overload Relays not more than 2000 volts ac or 750 volts ac.

##### ICS 6, Industrial Control and Systems: Enclosures 250, Enclosures for Electrical Equipment (1,000 Volts Maximum).

#### National Fire Protection Association (NFPA): 70, National Electrical Code (NEC).

#### Underwriters Laboratories, Inc. (UL): 1008, Transfer Switch Equipment.

## SUBMITTALS

### Action Submittals:

#### Descriptive product information.

#### Dimensional drawings.

#### Control diagrams.

#### Interface drawings with existing switchgear.

#### Equipment ratings.

### Informational Submittals:

#### Factory test reports.

#### Operation and Maintenance Data: Complete operations and maintenance information for components provided.

#### Manufacturer’s Certificate of Proper Installation.

## QUALITY ASSURANCE

### Authority Having Jurisdiction (AHJ):

#### Provide the Work in accordance with NFPA 70, National Electrical Code (NEC). Where required by the AHJ, material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ in order to provide a basis for approval under NEC.

#### Materials and equipment manufactured within the scope of standards published by Underwriters Laboratories, Inc. shall conform to those standards and shall have an applied UL listing mark.

# PART 2 PRODUCTS

## MANUFACTURERS

### Materials, equipment, and accessories specified in this section shall be products of:

#### G&W Electric Company Model ATC 451.

#### GE Model MX250.

## GENERAL

### Provide a microprocessor based automatic transfer control system to monitor utility power, systematically monitor and control switchgear main and tie breakers, and provide load based control of standby generators to ensure electric power to the switchgear according to the requirements specified. The automatic transfer control system shall be the standard product of the manufacturer.

### The automatic transfer control system shall interface with power operated breakers provided as part of the facility’s main switchgear specified under a separate specification section. Provide all needed components to interface the automatic transfer control system with breakers for OPEN and CLOSE control and respective position monitoring.

### In accordance with applicable standards of NFPA 70, NEMA ICS 1, NEMA ICS 2, NEMA ICS 6, IEEE C37.90.1, IEEE C37.90.2, and UL 1008.

### Operating Conditions:

#### Ambient Temperature: Maximum 50 degrees C.

#### Equipment to be fully rated without any derating for specified operating conditions.

## ENCLOSURE

### Type: Nonventilated NEMA 250, Type 12 when mounted in dedicated enclosure.

### Dead front, front accessible wall mounted cabinet with 14‑gauge welded stainless steel construction.

### Continuously hinged single door, with handle and lock cylinder.

### Finish: Baked enamel applied over rust-inhibiting, phosphated base coating.

#### Interior Panel Components’ Color: Provide gray finish as approved by Owner.

#### Unpainted Metal Parts: Plated for corrosion resistance.

### Optional Enclosure Type: Open for mounting in transfer control cubical in switchgear. Contractor has option to install automatic transfer control system in switchgear line-up.

## CONTROL MODULE

### Completely enclosed and mounted separately from switchgear.

### Microprocessor for sensing and logic control with inherent digital communications capability.

### Plug-in, industrial grade interfacing relays with dust covers.

### Connected to switchgear main breakers and tie-breaker by wiring harness having keyed disconnect plug.

### Plug-in printed circuit boards for sensing and control logic.

### Adjustable solid state undervoltage sensors for all three phases of normal and for one phase of standby generator source:

#### Pickup: 85 to 100 percent nominal.

#### Dropout: 75 to 98 percent of pickup setting.

### Adjustable frequency sensors for standby generator source:

#### Pickup: 90 to 100 percent nominal.

#### Dropout: 87 to 89 percent of pickup setting.

### Control module with adjustable time delays:

#### 0.5 to 6‑second engine start delay.

#### 0 to 5‑minute load transfer to standby generator delay.

#### 0 to 30‑minute retransfer to normal delay.

#### 0 to 30‑minute unload running time delay.

#### Switch to bypass above time delays during testing.

### Form‑C start contacts, rated 10 amperes, 32‑volt dc, for two-wire engine control, wired to terminal block.

### Exerciser, adjustable in 15‑minute increments, 7‑day dial clock to automatically exercise generator complete with door mounted NO LOAD and LOAD selector switch.

### Adjustable 0 to 5 minutes time delay relay for engine starting signal.

## INDICATORS

### Type:Manufacturer’s standard.

### Green lens to indicate switchgear position for normal power source.

### Red lens to indicate switch position for standby generator power source.

### White lens to indicate normal power source is available within parameters established by pickup and dropout settings.

### Amber lens to indicate standby generator power source is available within parameters established by pickup and dropout settings.

### Provide one normally open and one normally closed, 5 amperes, 120‑volt contact for remote indication when automatic transfer control system is in either position.

## GENERATOR PARALLELING EQUIPMENT

### When multiple generators are required at a given Site, provide the following components for each Owner‑provided generator that will allow multiple generators to be parralleled to a common bus:

#### Baldor, IntelliGen Controller.

#### Baldor, Generator Paralleling Dongle.

#### Baldor, IG Transformer.

#### Baldor, IG AVR1.

#### Baldor, Motorized Circuit Breaker.

## LOAD BASED GENERATOR CONTROLS

### Where multiple generators are utilized at a given facility, provide generator and load controls to optimize generator operating capacity with pump demand. Load based generator controls (LBGC) shall monitor the number of pumps that level control system is requesting and initiate the appropriate number of generators prior to starting the individual pumps. LBGC shall be provided with the following functionality:

#### When Utility power is initially lost and ATC calls for generator operation, the LBGC shall call for all generators to start, reach rated voltage and frequency and allow each generator’s controller parallel to the generator side of the main switchgear. The LBGC shall then allow the ATC to close the generator main breaker in the main switchgear.

#### Once initial load at pump station has stabilized for a period of 5 minutes, the LBGC shall initiate the shutdown of excess generators. The number of generators operating shall correlate with the numbered pumps in operation in the following table:

| Table 1 |
| --- |
| Number of Generators | 1stPump Combination | 2ndPump Combination | 3rdPump Combination | 4thPump Combination | 5thPump Combination |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 5 |  |  |  |  |  |

#### When pump station level controls requests an additional pump to start, the LBGC shall verify that the appropriate generator capacity is operating and if needed start additional generators. The LBGC shall acknowledge appropriate generating capacity via a discrete signal to the pump station level controls to allow the additional pump to start.

#### When pump station level controls stops a pump, the LBGC shall initiate the shutdown of excess generators to match Table 1 above.

### The LBGC shall incorporate the following I/O points:

#### Discrete Inputs:

##### Pump ON: Command from pump station level controls for each pump.

##### Generator RUNNING: Status from each generator.

##### Standby source ON: Command from ATC.

##### Wet well HIGH-HIGH level alarm.

#### Discrete Outputs:

##### Generator RUN: Command for each generator.

##### Pump RUN: Permissive for each pump.

##### LBGC common FAIL to SCADA system.

## FACTORY TESTS

### Test to ensure correct:

#### Operation of individual components.

#### Sequence of operation.

#### Transfer time, voltage, frequency, and time delay settings.

# PART 3 EXECUTION

## INSTALLATION

### Install in accordance with manufacturer’s instructions.

### Secure enclosure to structural steel channels attached to wall surface.

## FIELD QUALITY CONTROL

* + 1. Functional Test:
			1. Conduct on each controller.
			2. Inspect ATCS for electrical supply termination connections, interconnections, proper installation, and operation.
			3. Test for system operation with main-tie-main breakers and generator(s) in every possible scenario of breaker position, generator and utility source availability and operation all duty pumps, if LBGC is provided, to assure that they system will not encounter a situational malfunction.
			4. Record test data for report.
		2. Performance Test:
			1. Conduct on entire installed system, including main switchgear, engine generators and pumps.
			2. Perform under actual or approved simulated operating conditions.
			3. Demonstrate proper transfer of load from Utility source to engine generator source with the simulation of Utility power loss, including all associated sequence timers.
			4. Demonstrate proper transfer of load back from engine generator source to Utility source, including all associated sequence and cool-down timers.
			5. Demonstrate performance of the LBGC by manually operating combinations of pumps, as input conditions and wet well level allows, to verify the appropriate number of generators operate.
			6. Record test data for report.

## MANUFACTURERS’ SERVICES

### Manufacturer’s Representative: Present at Site or classroom designated by Owner, for minimum person-days listed below, travel time excluded:

#### 2 person-days for installation assistance and inspection.

#### 3 person-days for functional and performance testing and completion of Manufacturer’s Certificate of Proper Installation.

#### 1 person-days for functional demonstration to be witnessed by Owner and Site training of proper operation.

END OF SECTION