

# CITY OF ALAMO

## Request for Automatic Transfer Switch Bid

The City of Alamo hereby requests sealed bids for the following:

### AUTOMATIC TRANSFER SWITCH

Sealed bids addressed to Adela Perez, Purchasing Agent, will be accepted at the Alamo City Hall Purchasing Department, 420 N. Tower Rd, Alamo, Texas 78516, until **3:00 p.m.** on, **February 3, 2022**, at which time they will be opened and read aloud. Please mark envelope, “**Sealed Bid – Automatic Transfer Switch.**”

Potential Bidders/Respondents are advised that the bidding documents can be downloaded from the City of Alamo web page address: [www.alamotexas.org](http://www.alamotexas.org), and may also be secured at the Alamo City Hall Purchasing Department, 420 N. Tower Rd., Alamo, Texas, or by calling 956/787-0006 ext., 141. Be advised that if your company is contemplating on bidding this project you must contact the Purchasing Department, so that any changes/additions via addendum form can be forwarded to your company. (Please include your company name, address, telephone, fax, and email as well as contact person).

All bids shall be accompanied by a cashier’s check or certified check upon a national or state bank in the amount of five (5%) percent of the total maximum bid price, payable without recourse to the City of Alamo or a bid bond in the same amount from a reliable surety company as a guarantee that the Contractor will enter into a contract.

The City of Alamo reserves the right to accept or reject any and all bids and to accept the bid to be the best and most advantageous to the City and to hold bids for a period of forty-five (45) days without taking action. Bids submitted past the aforementioned date and time will not be accepted.

City of Alamo  
Adela Perez  
Purchasing Agent

SECTION 16496

AUTOMATIC TRANSFER SWITCH

PART 1 GENERAL

1.1 SUMMARY:

A. Section Includes:

1. Delayed transition automatic transfer switches to automatically transfer between normal and standby power sources.

1.2 REFERENCES:

A. National Fire Protection Association (NFPA)

1. NFPA 70 - National Electrical Code (NEC)

B. National Electrical Manufacturer's Association (NEMA)

1. NEMA ICS 2-447- AC Automatic Transfer Switches

C. Underwriters Laboratories (UL)

1. UL 1008 - Standard for Automatic Transfer Switches

1.3 SUBMITTALS:

A. Submit all products covered under this specification for Engineer's approval.

B. Manufacturer shall submit shop drawings for review, which shall include the following, as a minimum:

1. Descriptive literature
2. Plan, elevation, side, and front view arrangement drawings, including overall dimension, weights and clearances, as well as mounting or anchoring requirements and conduit entrance locations.
3. Schematic diagrams.
4. Wiring diagrams.
5. Accessory list.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Zenith

B. ASCO

- C. Onan
- D. Kohler
- E. Russelectric
- F. Pre-approved equal

## 2.2 CONSTRUCTION:

### A. General:

1. The delayed transition automatic transfer switch shall be furnished as shown on the drawings. Voltage and continuous current ratings and number of poles shall be as shown. Switches shall be UL listed in accordance with UL-1008.
2. The transfer switch shall be mounted in a NEMA 1 enclosure for indoors and NEMA 4X S.S. for outdoors, unless otherwise indicated. Enclosures shall be fabricated from 12-gauge steel. The enclosure shall be sized to exceed minimum wire bending space required by UL 1008. Outdoor enclosures shall have no exposed controls.
3. The transfer switch shall be equipped with an internal welded steel pocket, housing an operations and maintenance manual.
4. The transfer switch shall be top and bottom accessible.
5. The main contacts shall be capable of being replaced without removing the main power cables.
6. The main contacts shall be visible for inspection without any major disassembly of the transfer switch.
7. All bolted bus connections shall have Belleville compression type washers.
8. When a solid neutral is required, a fully rated bus bar with required AL-CU neutral lugs shall be provided.
9. Control components and wiring shall be front accessible. All control wires shall be multiconductor 18 gauge 600-volt SIS switchboard type point to point harness. All control wire terminations shall be identified with tubular sleeve-type markers.
10. The switch shall be equipped with 90 degrees C rated copper/aluminum solderless mechanical type lugs.
11. The complete transfer switch assembly shall be factory tested to ensure proper operation and compliance with the specification requirements. A copy of the factory test report shall be available upon request.

12. Transfer time shall be of sufficient duration to allow motor run controls to drop out or, Contractor shall provide additional time delay controls to accomplish this function.

B. Automatic Transfer Switch:

1. The transfer switch shall be double throw, actuated by two electric operators momentarily energized, and connected to the transfer mechanism by a simple over center type linkage.
2. The normal and emergency contacts shall be positively interlocked mechanically and electrically to prevent simultaneous closing. Main contacts shall be mechanically locked in both the normal and emergency positions without the use of hooks, latches, magnets, or springs, and shall be silver-tungsten alloy. Separate arcing contacts with magnetic blowouts shall be provided on all transfer switches. Interlocked, molded case circuit breakers or contactors are not acceptable unless specifically shown on plans.
3. The transfer switch shall be equipped with a safe external manual operator, designed to prevent injury to operating personnel. The manual operator shall be front accessible and shall provide "quick make-quick break" operation, offering the same contact to contact transfer speed as the electrical operator to prevent switching the main contacts slowly. The external manual operator shall be UL listed for operation, under load, from the outside of the transfer switch while the door is closed.

C. Automatic Transfer Switch Controls:

1. The transfer switch shall be equipped with a microprocessor based control system, to provide all the operational functions of the automatic transfer switch. The controller shall have two asynchronous serial ports. The controller shall have a real time clock with Nicad battery back-up.
2. The CPU shall be equipped with self diagnostics, which perform periodic checks of the memory I/O and communication circuits, with a watchdog/power fail circuit.
3. The controller shall use industry standard open architecture communication protocol for high speed serial communications via multidrop connection to other controllers and to a master terminal with up to 4000 ft of cable, or further, with the addition of a communication repeater. The serial communication port shall be RS422/485 compatible.
4. The serial communication port shall allow interface to either the manufacturer's or the owner's furnished remote supervisory control.
5. The controller shall have password protection required to limit access to qualified and authorized personnel.

6. The controller shall include a 20 character, LCD display, with a keypad, which allows access to the system.
7. The controller shall include three-phase over/under voltage, over/under frequency, phase sequence detection and phase differential monitoring on both normal and emergency sources.
8. The controller shall be capable of storing the following records in memory for access either locally or remotely:
  - a. Number of hours transfer switch is in the emergency position (total since record reset).
  - b. Number of hours emergency power is available (total since record reset).
  - c. Total transfer in either direction (total since record reset).
  - d. Date, time, and description of the last four source failures.
  - e. Date of the last exercise period.
  - f. Date of record reset.

D. Sequence of Operation:

1. When the voltage on any phase of the normal source drops below 80% or increases to 120%, or frequency drops below 90%, or increase to 110%, or 20% voltage differential between phases occurs, after a programmable time delay period of 0-9999 seconds factory set at 3 seconds to allow for momentary dips, the engine starting contacts shall close to start the generating plant.
2. The transfer switch shall transfer to emergency when the generating plant has reached specified voltage and frequency on all phases.
3. After restoration of normal power on all phases to a preset value of at least 90% to 110% of rated voltage, and at least 95% to 105% of rated frequency, and voltage differential is below 20%, an adjustable time delay period of 0-9999 seconds (factory set at 300 seconds) shall delay retransfer to allow stabilization of normal power. If the emergency power source should fail during this time delay period, the switch shall automatically return to the normal source.
4. After retransfer to normal, the engine generator shall be allowed to operate at no load for a programmable period of 0-9999 seconds, factory set at 300 seconds.

E. Automatic Transfer Switch Accessories:

1. Programmable three phase sensing of the normal source set to pickup at 90% and dropout at 80% of rated voltage and overvoltage to pickup at 120% and dropout out at 110% of rated voltage. Programmable frequency pickup at 95% and dropout at 90% and over frequency to pickup at 110% and dropout at 105% of rated frequency. Programmable voltage differential between phases, set at 20%, and phase sequence monitoring.

2. Programmable three phase sensing of the normal source set to pickup at 90% and dropout at 80% of rated voltage and overvoltage to pickup at 120% and dropout out at 110% of rated voltage programmable frequency pickup at 95% and dropout at 90% and over frequency to pickup at 110% and dropout at 105% of rated frequency. Programmable voltage differential between phases set at 20%, and phase sequence monitoring.
3. Time delay for override of momentary normal source power outages (delays engine start signal and transfer switch operation). Programmable 0-9999 seconds. Factory set at 3 seconds, if not otherwise specified.
4. Time delay to control contact transition time on transfer to either source. Programmable 0-9999 seconds, factory set at 10 seconds.
5. Time delay on retransfer to normal, programmable 0-9999 seconds, factory set at 300 seconds if not otherwise specified, with overrun to provide programmable 0-9999 second time delay, factory set at 300 seconds, unloaded engine operation after retransfer to normal.
6. Time delay on transfer to emergency, programmable 0-9999 seconds, factory set at 10 seconds.
7. A maintained type load test switch shall be included to simulate a normal power failure, keypad initiated.
8. A remote type load test switch shall be included to simulate a normal power failure, remote switch initiated.
9. A time delay bypass on retransfer to normal shall be included. Keypad initiated.
10. Contact, rated 10 Amps 30 volts DC, to close on failure of normal source to initiate engine starting.
11. Contact, rated 10 Amps 30 volts DC, to open on failure of normal source for customer functions.
12. Light emitting diodes shall be mounted on the microprocessor panel to indicate: switch is in normal position, switch is in emergency position and controller is running.
13. A plant exerciser shall be provided with (10) 7 day events, programmable for any day of the week and (24) calendar events, programmable for any month/day, to automatically exercise generating plant programmable in one minute increments. Also include selection of either "no load" (switch will not transfer) or "load" (switch will transfer) exercise period. Keypad initiated.
14. Provision to select either "no commit" or "commit" to transfer operation in the event of a normal power failure shall be included. In the "no commit position," the load will transfer to the emergency

position unless normal power returns before the emergency source has reach 90% of it's rated values (switch will remain in normal). In the "commit position" the load will transfer to the emergency position after any normal power failure. Keypad initiated.

15. Two auxiliary contacts rated 10 Amp, 120 volts AC (for switches 100 to 800 amps) 15 amp, 120 volts AC (for switches 1000 to 4000 amps), shall be mounted on the main shaft, one closed on normal, the other closed on emergency. Both contacts will be wired to a terminal strip for ease of customer connections.
16. A three phase digital LCD voltage readout, with 1% accuracy shall display all three separate phase to phase voltages simultaneously, for both the normal and emergency source.
17. A digital LCD frequency readout with 1% accuracy shall display frequency for both normal and emergency source.
18. An LCD readout shall display normal source and emergency source availability.
19. Contacts for "Transfer Impending", adjustable 0-120 SEC.

F. Ratings:

1. Delayed transition automatic transfer switches shall have the following 3 cycle short circuit closing and withstand as follows:

- a. RMS Symmetrical Amperes 480 VAC

<u>Amperes</u>	<u>Closing and Withstand</u>	<u>Current Limiting Fuse Rating</u>
100-400	42,000	200,000
600-800	65,000	200,000
1000-1200	85,000	200,000
1600-4000	100,000	200,000

2. During the 3 cycle closing and withstand tests, there shall be no contact welding or damage. The 3 cycle tests shall be performed without the use of current limiting fuses. The test shall verify that contacts separation has not occurred, and there is contact continuity across all phases. Test procedures shall be in accordance with UL-1008, and testing shall be certified by Underwriters' Laboratories, Inc.
3. When conducting temperature rise tests to UL-1008, the manufacture shall include post-endurance temperature rise tests to verify the ability of the transfer switch to carry full rated current after completing the overload and endurance tests.
4. The microprocessor controller shall meet the following requirements:
  - a. Storage conditions - 25 degrees C to 85 degrees C
  - b. Operation conditions - 20 degrees C to 70 degrees C ambient

- c. Humidity 0 to 99% relative humidity, noncondensing
- d. Capable of withstanding infinite power interruptions
- e. Surge withstand per ANSI/IEEE C-37.90A-1978

5. Manufacturer shall provide copies of test reports upon request.

G. Manufacturer:

- 1. The transfer switch manufacturer shall employ a nationwide factory-direct, field service organization, available on a 24-hour a day, 365 days a year, call basis.
- 2. The manufacture shall include an 800 telephone number, for field service contact, affixed to each enclosure.
- 3. The manufacturer shall maintain records of each transfer switch, by serial number, for a minimum 20 years.

2.3 WARRANTY:

- A. Provide 5 year standard manufacturer's warranty consisting of 2 years parts and labor, and an additional 3 years of replacement parts. Warranty shall be "on site" and warranty service shall be available by the factory service department on an emergency basis if required. Depot or non site warranties are not acceptable.

PART 3 EXECUTION

3.1 INSTALLATION:

- A. Automatic Transfer Switches shall be provided with adequate lifting means for ease of installation of wall or floor mounted enclosures.
- B. Provide access and working space as indicated or as required.

3.2 ADJUSTMENTS:

- A. Tighten assembled bolted connections with appropriate tools to manufacturer's torque recommendations prior to first energization.

3.3 START-UP AND TESTING:

- A. Provide the services of a factory representative to check-out, test, and start-up the automatic transfer switch in conjunction with the standby generator. Fully function test the automatic transfer switch to verify proper operation.

END OF SECTION