KGS

UPS & Battery Chargers

Replacement

Scope of Work

PWO 30684874

Revision 0 Apr.26.2021

Revision 1 May.10.2021

Revision 2 May.14.2021

Revision 3 Aug.4.2021 – MKVIe Card Location 2B2.

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7EB-E1602	B&V	EXISTING UPS & PANEL
7ED-E1603	B&V	EXISTING CHARGERS & PANEL
7MA-E7001	B&V	PLANT ARRANGEMENT
5-75008-0001	FLOUR	CUSTOM POWER STATIC SWITCH
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5-75010-0001	FLOUR	CUSTOM POWER BATTERY CHARGER
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REFERENCE DOCUMENTATION		
File Name	**By**	**Description**
Ametek Battery Charger	Ametek	Battery Charger Brochure
Ametek Charger Manual	Ametek	BBGS B50 Manual
Ametek Inverter	Ametek	Inverter Brochure
Ametek Invrtr RMBS & Xfmr Manual	Ametek	Inverter RMBS and Xfmr Manual
Ametek RMBS	Ametek	Remote Manual Bypass Switch
Attachment A	JEA	Cable and Wire Tags
Attachment B	JEA	Conduit PICS
Attachment C	JEA	B22 Channel for RMBS
Attachment D	JEA	PLACARDS

Scope of Work

1.0 Materials Supplied & Work Done By UPS Manufacturer:

Ametek shall deliver two 160A Ametek DCR battery chargers, one Ametek Slim Line 15kVA PWM inverter, one 15kVA Remote Manual Bypass Switch, and one 15kVA 208/120V bypass transformer. After the installation is complete, Ametek shall provide a Commissioning Service and provide training for up to three technicians on the same day. It is expected that two days of commissioning services will be required. The equipment shall conform to the attached specification.

1.0.1 Supply two Ametek 160A twelve pulse Battery Chargers

Ametek shall supply two new 160A Ametek, twelve pulse DCR battery chargers with appropriate lifting eyes. The equipment shall be shipped on a wooden type pallet suitable for forklift handling and rigging. The equipment shall be covered with clear plastic sheeting or wrapping to prevent dust and dirt from entering the cabinet during shipment and storage. The corners and edges of the equipment shall be lined with material so that any banding or wrapping will not score the paint or bend any metal. All aspects of the battery chargers shall conform to the attached specification.

1.0.2 Supply one Ametek Slim Line 15kVA PWM Inverter-static switch.

Ametek shall supply one new Ametek Slim Line 10kVA inverter-static switch supplied with appropriate lifting eyes. The equipment shall be shipped on a wooden type pallet suitable for forklift handling and rigging. The equipment shall be covered with clear plastic sheeting over wrapping to prevent dust, dirt and moisture from entering the cabinet during shipment and installation. The corners of the equipment shall be lined with material so that any banding or wrapping will not score the paint or bend any metal. All aspects of the Inverter-Static Switch shall conform to the attached specification.

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1.0.3 Supply one Ametek 15kVA Remote Manual Bypass Switch.

Ametek shall supply one new 15kVA Remote Manual Bypass Switch. The equipment shall be shipped on a wooden type pallet suitable for forklift handling and rigging. The equipment shall be covered with clear plastic sheeting over wrapping to prevent dust, dirt and moisture from entering the cabinet during shipment and installation. The corners of the equipment shall be lined with material so that any movement in shipping will not score the paint or bend any metal. All aspects of the Remote Manual Bypass Switch shall conform to the attached specification.

1.0.4 Supply one 15kVA 208/120VAC Bypass Transformer.

Ametek shall supply one new 15kVA 208/120Vac Bypass Transformer. The equipment shall be shipped on a wooden type pallet suitable for forklift handling and rigging. The equipment shall be covered with clear plastic sheeting over wrapping to prevent dust, dirt and moisture from entering the cabinet during shipment and installation. The corners of the equipment shall be lined with material so that any movement in shipping will not score the paint or bend any metal. The Manufacturer shall take full responsibility for the condition of the equipment during shipping. All aspects of the Bypass Transformers shall conform to the attached specification.

1.0.5 Provide one day of Start-Up Service for Commissioning/ Training.

Ametek shall provide (2) full 8 hour days of commissioning support for the inverter, battery charger and remote manual bypass switch. During the commissioning, three JEA technicians shall be allowed to start up, make switching operations, and shut down the equipment. The alarm circuits shall be tested by JEA I &C. The system shall be completely installed and ready to operate by 8:00 AM on the scheduled day for commissioning. The price for the commissioning and training shall include all (travel, lodging, transportation and meal) costs associated with the trip.

1.0.6 Provide Test Results from Commissioning.

Ametek shall provide test data from the manufacturing facility along with an operations manual, bill of material and job specific drawings. The Commissioning Service shall generate a System Testing Report that demonstrates conformance with IEEE 944-1986 Section 7.0 and IEC – 146 – 4.

1.1 Materials Supplied & Work Done by Electrical Contractor:

The awarded Electrical Contractor shall remove the existing Custom Power Inverter, Static Switch, Battery Chargers, Shape Isolimiter, and associated cables and fittings. The Electrical Contractor shall provide all cables, conduits, lugs, tools, consumables and supervision to successfully install the new UPS System in conformance with the National Electrical Code NFPA 70. The Electrical Contractor shall transport the new UPS System from the warehouse to the PECC and switchgear room and provide a machine to lift the equipment onto the metal grating outside. There will be no assistance in rigging or providing straps to lift the new equipment. The Contractor shall provide and operate the lull needed to lift the new chargers, inverter-static switch, bypass switch, bypass transformer, cables, conduit and fittings up to the steel grating; roughly ten feet above grade. JEA will not provide riggings or offer assistance in connecting straps to the existing load. The equipment shall be palletized or mounted on material suitable to land on top of metal grating outside of the MCC as they will have to be rolled on top of metal grating a

few feet before rolling over a small threshold and through the double doors. The metal grating will be difficult to roll over with a standard pallet jack. **The contractor shall use an industrial grade hydraulic furniture mover such as a WESCO Hydraulic Furniture Mover part # 272952 (or equivalent) to move the battery chargers, inverter and transformer**. **Moving blankets shall be used to move the equipment into position as to avoid scuffing the paint.** The responsibility of being able to move the equipment safely into the MCC without damaging any equipment will be completely owned by the Contractor. Temporary # 10 cables shall be ran from spare breaker # 6 in the DC Lube Oil panel K37-ED26-001 to the DC Control panel K37-ED26-003. The temporary cables will ideally be ran prior to the outage so that when operations is ready to apply the LOTO, the temporary conductors will be in place and be ready for termination. After the equipment is terminated and commissioned, Placards shall be supplied by JEA and applied to each piece of equipment with silicone.

1.1.1 Remove Old UPS Systems, Battery Chargers and Isolimiters.

The Contractor shall remove two existing Custom Power Battery Chargers, one 10kVA Custom Power ISS and one Shape Isolimiter. A temporary feed to the UPS panel shall be ran from a 20A spare breaker in the K37-EB26-003 to breaker number 18 in the UPS panel. The Contractor shall provide and operate a lull needed to lower the chargers, inverter, static switch, and isolimiter from the grating, roughly ten feet above grade, to the ground. JEA will not provide riggings or offer assistance in connecting straps to the load. The equipment shall be palletized or mounted on material suitable to rig off of the metal grating outside of the MCC. The method of removal shall not have any negative consequence on other equipment, doors, doorframes, or thresholds. It is expected that the removal will possibly damage the existing UPS equipment. The UPS equipment shall be palletized on the ground and depending on the condition of the equipment after removal, JEA may decide to keep it for spare parts until all of the UPS systems are replaced. The Contractor shall not keep the removed equipment unless a credit is given to JEA for the value of the equipment.

1.1.2 Mount New Inverters and RMBS switches.

The inverter-static switch shall be mounted as close to the south east corner of the space as possible. Both 2” Aluminum RMC shall be modified above the RMBS to penetrate through the top entry for the 120VAC cables. This is the location of the existing static switch cabinet. The location of the new bypass switch and new inverter-static switch for KGS 7 are shown below in red and green respectively. The inverter-static switch shall be floor mounted using half inch stainless steel expansion anchors with at least three inches of embedment using a flat washer and a hex nut. The RMBS switches shall be mounted on 12 Gauge B22 Channel as shown in Attachment C. The RMBS Stands shall be floor mounted using 3/8 inch

stainless steel expansion anchors with at least three inches of embedment using a flat washer and a hex nut. The thread shall be 6 inches long.

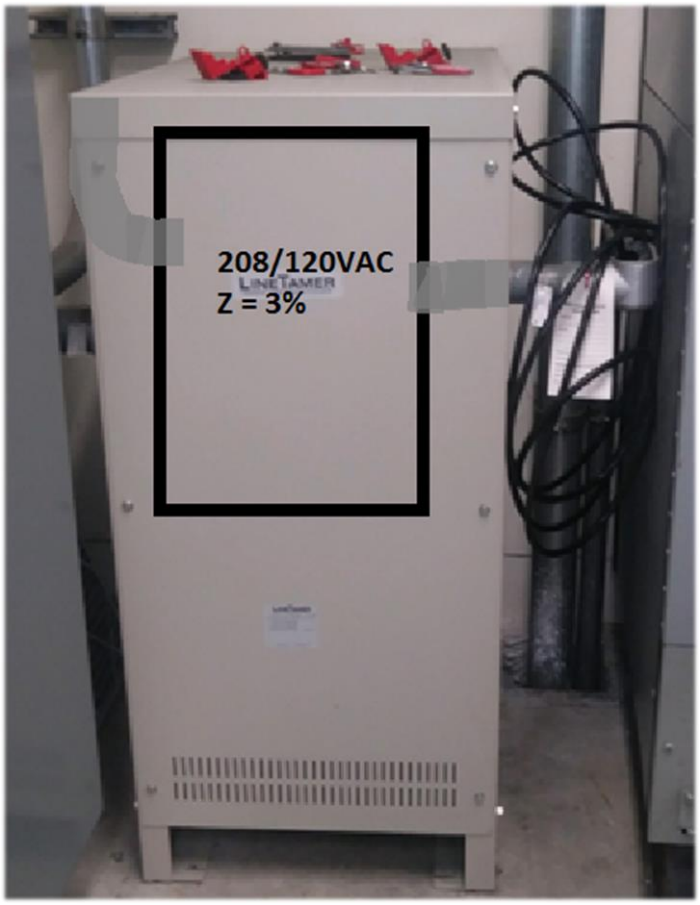
Location for New RMBS and Inverter-Static Switch.

1.1.3 Mount New Bypass Transformer and Battery Chargers.

The Electrical Contractor shall mount the Battery Chargers to the left of the inverter shown above. The existing 3" steel RMC above charger number two, shown below, shall be modified so that both chargers and the inverter have an independent penetration for the DC cables. Both 2" Aluminum RMC shall be modified above the chargers to penetrate through the top entry on the new chargers for the 480VAC feeder cables. The battery chargers and bypass transformer shall be floor mounted using half inch stainless steel expansion anchors with three inches of embedment using a flat washer and a hex nut.

KGS 7 Location for New Battery Chargers.

The Electrical Contractor shall mount the new bypass transformer with 1.5” stainless steel uni-strut on the east wall where the Shape Isolimiter is currently positioned (shown below). If the primary conductor is at least a # 1 awg and is a $90°C$ tray rated cable then it is likely that it could be reused. The existing power conditioner is currently bypassed as it has failed.



KGS 7 Location for New 208/120V Bypass XFMR.

1.1.4 Run New Cables and Modify Conduits for New Equipment.

The Electrical Contractor shall provide and install new cables for the new equipment. The list is shown below. Almost all of the existing conduits shall be modified in order to install the new equipment. It is expected that the Electrical Contractor will make each circuit enter each piece of equipment independently. This is so that a replacement could be easier in the future. Each conduit shall not exceed 40% fill with the new cable. It is acceptable to reduce the size of conduit at T's and LB's by using bushings or reducers to make the installation more cost effective and less labor intensive, however, the conduit fill must be less than 40%. Conduits are shown in Attachment B.

The Battery Chargers shall have an eight pair TC 14 awg XHHW tray rated cable ran to the MKVIe BOP on the east wall of the Control Room in the PECC. The inverter and RMBS shall have an eight pair TC 14 awg XHHW tray rated cable ran to the same cabinet. These cables will require conduits ran from each piece of

equipment. It is expected that there is space in an existing hole in the floor to run conduit. There are low voltage cable trays below the floor, to run the cables to the MKVIe. The Circuits for KGS 7 shall have cable tags made for both ends of each cable. **When penetrating the enclosures with knock-outs or hole-saws, the cable entry plate shall be removed, and drilled at an alternate location to the equipment as to avoid getting metal shavings inside the equipment.**

Circuits:	Cable Type:	Cable Length	Total
7EBE1601A07	3C # 4 W # 8 GND. XHHW-2 Tray Rated Cable.	75'	75’
7EBE1601A08	3C # 4 W # 8 GND. XHHW-2 Tray Rated Cable.	75'	75’
7EDE160303A	(2) 4/0 RHH DLO W # 4 GND.	50'	100’ 50’
7EDE160303B	(2) 4/0 RHH DLO W # 4 GND.	55'	110’ 55’
7EDE160303	(2) 2/0 RHH DLO W # 4 GND.	55'	110’ 55’
7EBE1601B02	2C # 2 W # 8 GND. XHHW-2 Tray Rated Cable.	75'	75’
7EBE160201	(2) # 2, (1) # 8 GND. XHHW-2	50'	100’ 50’
7EBE160201A	(2) # 2, (1) # 8 GND. XHHW-2	12.5'	25’ 12.5’
7EBE160201B	(2) # 2, (1) # 8 GND. XHHW-2	12.5'	25’ 12.5’
7EBE160202	2C # 2 W # 8 GND. XHHW-2 Tray Rated Cable.	75'	75’
7EDEALMB03	8 Pair TC # 14 XHHW-2 Tray Rated Cable.	65'	65’
7EDEALMB03A	8 Pair TC # 14 XHHW-2 Tray Rated Cable.	65'	65’
7EDEALMB03B	8 Pair TC # 14 XHHW-2 Tray Rated Cable.	65'	65’
7EDEALMB03C	8 Pair TC # 14 XHHW-2 Tray Rated Cable.	65'	65’

New Cables Provided by Electrical Contractor.

1.1.5 Crimp New Lugs for Cable Terminations.

The Electrical Contractor shall use the Ametek recommended Burndy lug for each termination. The connections shall be made by compression with a die crimped, 600V rated, copper tin plated, Burndy lug. The lugs shall be bolted down to the bus bar with 316 stainless steel hardware. Each bolt shall be torqued onto the bus using flat washers and lock washers, to the torque specification for each bolt per Ametek manual. The hole spacing for the terminations shall be verified in the field prior to the job when the equipment arrives on site. Each bolt shall have at least two threads showing and no more than four after the bolt is torqued down. For each alarm wire connection, the Electrical Contractor shall use T&B Ring Terminals with appropriate T&B Crimpers. The Contractor shall be responsible for terminating 6 pair in the inverter, 4 pair in each charger and 6 pair in the RMBS. All new wire tags are listed in Attachment A.

1.1.6 Use Existing Breakers.

The existing 100A main breaker in the UPS panel shall be used for the RMBS output. The existing 250A breakers in the DC panel shall be reused for the battery chargers. The inverter shall terminate directly to the lugs at the top of the DC panel.

1.2 Work Done by JEA:

JEA shall provide site access and site specific safety training. It shall be the contractor's responsibility to acquire the JEA Contractor Safety Qualification. The Contractor will start by filling out the questionnaire that can be found at:

https://www.jea.com/About/Procurement/Contractor_Safety/

Any questions regarding Contractor Safety Qualification shall be directed to Jerry Fulop. Jerry can be reached directly at 904.665.5810 or by emailing him at FuloJE@jea.com . The Lock-Out, Tag-Out (LOTO) system utilized by JEA requires that the JEA Project Manager sign onto an electronic clearance utilizing lock boxes for keys that go to locks that secure each point on the clearance. The Contractor can sign onto a hard copy that is assigned to the clearance or work underneath the JEA Project Manager. This process should be discussed prior to the Contractor submitting a bid as this can be time consuming and can be a point of disagreement between two parties that have different policies. At least one JEA Electrician, one JEA Operator, and one JEA I&C Technician shall be on site to assist during commissioning. JEA Engineering shall provide a scope of work, drawings, schematics and address any questions regarding the installation for the contractor.

1.2.1 Perform Switching Operations for LOTO.

JEA shall provide access to all spaces needed for the installation of the rented battery chargers and access to the front gate of the plant. JEA shall also provide plant personnel to conduct breaker and disconnect operations needed for LOTO. A LOTO walk down sheet will be provided, and all breaker and disconnect operations will be completed by JEA Operations. A JEA Electrician will verify that each panel is de-energized before any work is performed.

1.2.2 Terminate Alarm wires and Circuit Breakers.

JEA shall be responsible for terminating circuit breakers inside of each power panel. JEA shall also be responsible for terminating 20 pairs of alarm wires inside of the MKVIe. The Alarm Cables shall be ran to Card 2B2, in the BOP cabinet. At least 10 feet of slack shall be pulled through the cable entry in the bottom of the cabinet so that the cable can be properly dressed in to match the existing cable routing and to provide service loop. JEA shall provide the following:

TBCI H2C Termination board (Josh Reed to order through GE.)

PDIA I/O PAC (Josh Reed to order through GE.)

Accessory cabling (Josh Reed to order through GE.)

1.2.3 Build Alarm Screens for Power Plant Operations.

JEA Engineering Shall Design alarm screens for the Operators at BBGS. The graphics shall mimic the screens on the new equipment so that when an Operator is in the field looking at the HMI there is a resemblance of what is displayed in the control room.

1.2.4 Assist in Commissioning – Training.

JEA shall assist Ametek in switching operations to conduct the system commissioning and alarm testing. Operations and Electricians shall be available to communicate from the field to the control room so that the alarms can be verified to function correctly.

1.3 Work Done by Battery Contractor:

1.3.1 Remove Rental UPS System.

Nolan shall be scheduled by Mike Lafayette to remove the temporary UPS just **after** the new system is commissioned.