

Minute Entry Sign Up Sheet

Date: 3/29/2023

Time: 10:00 AM

001WL;

002WL;004

WL;005WL;

Bid #

006WL

Department: TW&L

BID# 2023-001WL; 2023-002WL; 2023-004WL; 2023-005WL;2023-006WL

Project:

N. Green Substation

Attendance

Company

Ben Logan

City of Tupelo

Casey Turner

Howard Agency

JASON SIMON

HV Sales

Jesse Hall

Virginia Transformer

Gunnlee Shempel

COT

Norman Cause

TWL



Allen&Hoshall

1661 International Drive, Suite 100
Memphis, Tennessee 38120
Office 901.820.0820
Fax 901.683.1001
www.allenhoshall.com

March 31, 2023

Mr. Johnny Timmons, General Manager
Tupelo Water and Light Department
320 North Front Street
Tupelo, MS 38802

**RE: 2023-004WL
161 kV Breakers
North Green Street Substation**

Dear Mr. Timmons:

We have evaluated the bids on the above-referenced project. After careful consideration and evaluation, we recommend you accept the bid of \$161,850 from GE that includes Item 1 below:

ITEM 1	\$161,850.00	(2) 170 kV Power Circuit Breakers manufactured by GE Grid Solutions per GE Proposal Number – MS-OP23031377340, dated March 29, 2023.
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The Purchase Order should state: "ITEM 1: North Green Street Substation – (2) 170 kV Power Circuit Breakers per GE Proposal Number – MS-OP23031377340, dated March 29, 2023 with shipment 86-90 weeks ARO"

Purchase Order should be sent to:

GE Grid Solutions, LLC.
1 Power Lane
Charleroi, PA 15022

Attached is the Bid Tabulation and the GE Grid Solutions Bid Proposal for your use.

If there are any questions or you need additional information, please contact me at 901.261.4639.

Sincerely,

Allen & Hoshall

Russell Scott Burleson, P.E.
Sr. Vice President



**161 kV CIRCUIT BREAKERS
FOR
NORTH GREEN STREET SUBSTATION
TUPELO WATER & LIGHT**

<u>Bidder</u>	<u>Quantity</u>	<u>Price Each</u>	<u>Price Total</u>	<u>Delivery & Terms</u>
<i>Hitachi/ABB</i>				
ITEM 1	2	<u>No Bid</u>	<u></u>	<u></u>
GE				
ITEM 1	2	<u>\$80,925.00¹</u>	<u>\$161,850.00</u>	<u>86-90 weeks</u>
<i>Mitsubishi</i>				
ITEM 1	2	<u>No Bid</u>	<u></u>	<u></u>
<i>Siemens</i>				
ITEM 1	2	<u>Bid Disqualified²</u>	<u></u>	<u></u>

1. Liquidated Damages will be \$300 per day capped at 5% of the delayed portion of the contract
2. Physical Bid Not Received

C:\EU\TUPELO L&W\81925-N GREEN ST SUBSTATION\SPECS\0.7 - 161 KV BREAKER\BID TAB 161 KV CIRCUIT BREAKER.DOC



Tupelo Water & Light Dept. North Green Street Substation

March 29, 2023

GE Proposal Number – MS-OP23031377340 – Revision 0

GE Grid Solutions, LLC
One Power Lane
Charleroi, PA 15022
USA
www.GEGridSolutions.com



Proudly Designed and
Manufactured in
Charleroi, PA, USA

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1 Executive Summary

Tupelo Water & Light Dept.
Attn: Johnny Timmons, General Manager

Allen & Hoshall
Attn: Scott Burleson, P.E.

Thank you for your interest in GE Grid Solutions, LLC for the reference opportunity. We are pleased to submit the enclosed proposal for your consideration in accordance with the specification provided and the noted comments, clarifications, and exceptions.

Grid Solutions is an industry leading manufacturer of high voltage circuit breakers with R&D and manufacturing facilities located in Charleroi, Pennsylvania. Our facility is the Competence Center for research and development, testing, and manufacturing of dead tank circuit breakers for worldwide distribution and is certified to ISO 9001-2015 and ISO 14001-2015.

The factory has manufactured and delivered over 38,000 breakers since 1995 to locations all over the world. In addition to the product offered herein, we have a complete range of dead tank circuit breakers, live tank circuit breakers and circuit switchers to meet your needs now and into the future.

Our uniquely qualified team includes industry leaders with decades of experience in the transmission and distribution world as well as the high voltage circuit breaker industry. The members of the Grid Solutions team are available at any time and are dedicated together with our Charleroi staff of over 350 employees to providing you best in industry service and support.

We once again thank you for this opportunity to submit an offer and look forward to answering any questions which arise while reviewing our proposal.

Sincerely,

George Muchesko
Lead Sales & Proposal Manager
Phone: 724-483-7874
Email: George.Muchesko@ge.com

2 Proposal

Item #1

Two (2) 170 kV Dead Tank Circuit Breakers according to ANSI/IEEE standards for outdoor installation with mechanical spring operating mechanisms including support structures:

▪ Type	DT1-170 FK F1
▪ Rated Nominal Voltage	161 kV
▪ Rated Maximum Voltage	170 kV
▪ Frequency	60 Hz
▪ First Pole to Clear Factor	1.3
▪ Rated Continuous Current	1200 A
▪ Rated Short-Circuit Current	40 kA
▪ BIL	750 kV
▪ Creep Distance / Material / Color	185" / Porcelain / Gray
▪ Insulating Medium	SF ₆ - Included for 1 st Fill
▪ Interrupting Time	3 cycles
▪ High-Speed Auto-Reclosure	3 phase, Gang Operated
▪ Current Transformers	(6) 600:5 MR C400, TRF 4.0
▪ Cabinet Enclosure Rating / Material	NEMA 3R / Painted Steel
▪ Ambient Temperature	-30°C to +40°C without tank heaters
▪ Seismic Rating	Per IEEE 693-2005 Moderate
▪ Altitude	≤ 3,300' ASL
▪ Control Voltage / Range	125 VDC / (T) 70-140 VDC - (C) 90-140 VDC
▪ Motor Voltage	120 VAC / 125 VDC
▪ Alternate Current Circuit (Lighting / Heating):	120 VAC / 240 VAC

Unit Price: \$79225.00 - USD, DDP Jobsite, MS

*** SF6 Gas Surcharge per breaker:** \$1,700.00 - USD

Total Unit Price: \$80,925.00 - USD, DDP Jobsite, MS

Extended Price: \$161,850.00 - USD, DDP Jobsite, MS

***SF6 Surcharge:** The price of Sulfur Hexafluoride is subject to the enclosed surcharge due to global events that have affected cost and availability.

4 Comments, Clarifications, and Exceptions

- * This offer is made strictly in accordance with the attached Terms and Conditions for Sale of Products and Services Form EM 104 (Grid Solutions).

161 kV Power Circuit Breakers for North Green Street Substation – January 2023:

Document 00301:

- * Liquidated damages will be \$300.00 per day capped at 5% of the delayed portion of the contract.
- * Unloading onto existing concrete pads; field inspection, testing, certification and field assembly is not included in the price of the breaker.
- * Bid bond and performance bond not required.

Document 00711

- 10.A Liquidated damages will be \$300.00 per day capped at 5% of the delayed portion of the contract.

Document 01721

- 3.02.D Due to the factory load, the circuit breakers cannot be held for two weeks. GE can offer to send the test results via PDF for reviewing all documents, including the factory test results prior to shipment. GE will give the customer two working days to review the test results.

Section 16353

- 1.04.B.1.a 170kV
- 1.04.B.1.b 40kA
- 1.04.B.1.c 40kA
- 1.04.B.1.d 40kA
- 1.04.B.1.e 100%
- 1.04.B.2 See attached outline drawing
- 1.04.B.3 Trip and close coils: 3.5A / 125VDC, Motor: 31A inrush, 9A running at 120VAC / 125VDC
- 1.04.B.4 Please refer to attached CT Curves
- 1.04.B.5 No special tools are required for installation or maintenance of the circuit breaker. Therefore, no additional tools will be provided. We have included one gas regulator with fill hose per substation.
- 1.04.B.6 < 10 seconds
- 1.04.B.7 See attached maintenance schedule.
- 1.05.B.2.c Anchor bolt design is not the responsibility of the supplier. It is the responsibility of the customer to verify the mechanical integrity of said anchors as well as the customer's foundation

according to the foundation loading requirements as specified on the GE Grid Solutions contract drawing.

- 2.03.B.4 Each bushing is provided with an integral aluminum NEMA four (4)-hole pad for high voltage termination. Bushing studs and stud connectors are not supplied.
- 2.05.A The proposed 170 kV circuit breakers do not have swing panels in the control cabinet. All control components are attached to front mounted flush panels with easy access for wiring
- 2.05.B.4 Shunt release are not available on the proposed breakers. Two independent trip coils are offered.

Section 16353D

- 1.03.K.1 Anchor bolt design is not the responsibility of the supplier. It is the responsibility of the customer to verify the mechanical integrity of said anchors as well as the customer's foundation according to the foundation loading requirements as specified on the GE Grid Solutions contract drawing.

5 Commercial Terms of Sale

Validity:	Forty-five (45) days after the date of this proposal.
Delivery:	<p>Standard delivery is between eight-six (86) to ninety (90) weeks after receipt of order (ARO). All orders are subject to prior factory loading and material availability at the time of purchase order placement.</p> <p>All orders are subject to PO delivery date no later than 10 weeks after the quoted lead time. Longer delivery schedules are subject to the enclosed price escalation.</p>
Delivery Note:	Delivery is based upon customer return of approved drawings in two (2) weeks. Drawings will be submitted for approval between eight (8) to ten (10) weeks after receipt of order.
Shipping Point:	Charleroi, Pennsylvania, USA.
PO Remittance:	GE Grid Solutions, LLC., One Power Lane, Charleroi, PA 15022.
Terms of Delivery:	Pricing is firm in USD, FOB Jobsite (DDP per INCOTERMS 2020), pre-paid and allowed. Shipment to destination is limited to sites accessible by the vehicle in which the unit ships from the factory. Unloading is to be provided by others.
Payment Conditions:	<p>20% down payment.</p> <p>80% after delivery.</p> <p>All Payments are 30 days after invoice by wire transfer.</p>
Instruction Manuals:	One instruction book is shipped inside the control cabinet of the breaker. Remaining instruction books will ship within two weeks of breaker shipment.
Warranty:	Sixty (60) months after installation, not to exceed sixty-six (66) months after delivery. Warranties exclude wear and tear associated with normal circuit breaker operation, circuit breakers used in special applications not covered by ANSI/IEEE C37.04, and circuit breakers that have exceeded the maximum allowable cumulated current. Warranties are based on strict accordance with the maintenance instructions found in the breaker manual.
Liquidated Damages:	\$300 per day capped at 5% of the delayed portion of the contract.
Sales Tax:	This offer does not include any sales tax (federal, state or local).
Damages:	The manufacturer shall not be liable for consequential or indirect damages such as loss of use, profit, contract, production, or any financial loss. In addition, the total liability is limited to a maximum of the contract value. The right for technical modifications is reserved.

Cancellation: In the event of order cancellation, a payment will be due based on the table below.

Schedule (based on EXW factory)	Cancellation Charge
	(% of contract value)
0 – 2 weeks after receipt of order	5.0%
2 – 4 weeks after receipt of order	10.0%
30+ weeks before shipment	15.0%
24 – 30 weeks before shipment	15.0%
20 – 24 weeks before shipment	20.0%
16 – 20 weeks before shipment	40.0%
8 – 16 weeks before shipment	60.0%
4 – 8 weeks before shipment	80.0%
0 – 4 weeks before shipment	100.0%

Delays: In case of delay, a progress payment will be due based on the table below and subject to price escalation

28+ weeks before delivery	0.0%
24 – 28 weeks before shipment	5.0%
16 – 24 weeks before shipment	10.0%
14 – 16 weeks before shipment	15.0%
8 – 14 weeks before shipment	25.0%
4 – 8 weeks before shipment	70.0%
0 – 4 weeks before shipment	<p>100% plus Storage Fees. Short term storage of up to 4 weeks is \$750 per breaker per week (\leq 245kV). Storage fees in excess of 4 weeks and for >245kV will be quoted at the time of request.</p>

Escalation:

Prices subject to escalation will be adjusted based on the price escalation formula shown below and utilizing the latest data for the listed indices from the US Bureau of Labor Statistics website <http://data.bls.gov/cgi-bin/srgate> as listed herein and with reference to the original date of this proposal.

$$PA = \frac{PCa \times \frac{a2}{a1} + PCb \times \frac{b2}{b1} + PCc \times \frac{c2}{c1} + PCd \times \frac{d2}{d1} + PCE \times \frac{e2}{e1} + PCf \times \frac{f2}{f1} + PCg \times \frac{g2}{g1} + PCh \times \frac{h2}{h1} + PCi \times \frac{i2}{i1}}{100}$$

Porcelain bushing insulators:

	BLS Series ID	Series Title	PC Content %	1 Month Year	2 Month Year	% change
a	WPU102802	Aluminum castings	20.0%	PCa	a1	a2
b	PCU33211133211111	Hot impression die impact, press, and upset carbon steel forgings	8.0%	PVb	b1	b2
c	PCU335929335929A	Electronic wire and cable, made of nonferrous metals	3.0%	PCc	c1	c2
d	PCU3271103271107	Porcelain, steatite, and other ceramic electrical products	12.0%	PCd	d1	d2
e	CEU0500000008	Average hourly earnings of production workers	12.0%	PCe	e1	e2
f	PCU335314335314	Relay and industrial control mfg	2.0%	PCf	f1	f2
g	PCU4842304842306	Specialized freight (except used goods) trucking, long-distance	10.0%	PCg	g1	g2
h	PCU335311335311	Electric power and specialty transformer mfg (BCTs)	8.0%	PCh	h1	h2
i	PCU335313335313	Switchgear and switchboard apparatus mfg	20.0%	Pci	i1	i2
j		Fixed	5.0%	PCj		
			100.0%	Price Adjustment (PA) = PA		

Composite bushing insulators:

	BLS Series ID	Series Title	PC Content %	1 Month Year	2 Month Year	% change
a	WPU102802	Aluminum castings	20.0%	PCa	a1	a2
b	PCU33211133211111	Hot impression die impact, press, and upset carbon steel forgings	8.0%	PVb	b1	b2
c	PCU335929335929A	Electronic wire and cable, made of nonferrous metals	3.0%	PCc	c1	c2
d	PCU335991325991P	Custom compounding of purchased resins (Comp Insulators)	12.0%	PCd	d1	d2
e	CEU0500000008	Average hourly earnings of production workers	12.0%	PCe	e1	e2
f	PCU335314335314	Relay and industrial control mfg	2.0%	PCf	f1	f2
g	PCU4842304842306	Specialized freight (except used goods) trucking, long-distance	10.0%	PCg	g1	g2
h	PCU335311335311	Electric power and specialty transformer mfg (BCTs)	8.0%	PCh	h1	h2
i	PCU335313335313	Switchgear and switchboard apparatus mfg	20.0%	Pci	i1	i2
j		Fixed	5.0%	PCj		
			100%	Price Adjustment (PA) = PA		

Hardship:

If due to an event that is beyond the Seller's reasonable control and which it could not reasonably have been expected to have taken into account at the time of the submission of the Offer (which will include for the avoidance of doubt the evolution of any event that was pre-existing at the time of submission of the Offer but which impact was not capable of being properly assessed), the Seller shall be entitled to request revision of the prices and, as applicable, of the other conditions of its Offer to take into account the consequences of the above mentioned event. In the case where the Buyer would not permit the Seller to revise and update its Offer, the Seller shall be entitled, subject to written notice to the Buyer, to withdraw its Offer without liability to the Buyer. Buyer is hereby informed that the consequences that the conflict in Ukraine and its future evolutions may have on prices and availability of raw materials, manpower, component, transport and logistics and any other components of the scope of the Offer shall be considered for the purpose of this provision."

During contract execution, in case the Contract does not comprise a price escalation mechanism and if a Party can demonstrate that the continued performance of its contractual obligations has become excessively onerous due to a Force Majeure event (as defined in the contract and which will include evolution of any event pre-existing at the time of signature of the Contract), the Parties are bound, within a reasonable time of written notice by one Party to the other, to negotiate alternative contractual terms or a mitigation plan which reasonably permit the consequences of the event to be mitigated or the restoration of the balance that was pre-existing at the signature of the Contract between the Parties. The Party serving notice under this Clause shall provide the other Party with as much commercially available details of the event or events affecting that Party's contractual obligations, the affected obligations themselves and how and to which extent these events are (and will be) affecting the performance of the Contract. The Parties shall act in the spirit of openness and transparency in this communication within the limits set by applicable antitrust laws and regulations. Where an agreement is reached, the Parties shall start implementing the agreed measures immediately, pending the signature of the relevant amendment to the Contract. In the event the Parties are unable to agree on alternative contractual terms or on a mitigation plan as provided above within fifteen (15) days of the written notice, and in the absence of any other agreement, the Party serving notice under this Clause will be entitled to either suspend its performance of the affected portion of the Contract, or to terminate the Contract, without any liability to the other party. If the Contract is suspended for a period greater than 60 consecutive days by that Party, either Party may terminate the Contract by sending written notice of termination to the other Party. In case of termination of the Contract hereunder, the Parties shall settle their accounts accordingly as if the Contract had been terminated through no fault of the Parties, without prejudice to any Party's right to pursue a dispute in accordance to the dispute resolution mechanism set forth in the contract.

COVID-19:

The impacts of Coronavirus cannot be reasonably determined at this time. This proposal does not account for any potential adverse impacts of Coronavirus on GE's performance of obligations. In the event of any delays and adverse impacts, GE reserves the right for an equitable adjustment of the schedule and prices herein to offset the effects of Coronavirus delays.

6 General Comments / Characteristics

The circuit breakers offered belong to a family of switchgear highlighted by the following features:

- Third generation SF₆ interrupter with advanced thermal effect interrupter.
- Mechanical spring/spring operating mechanism.
- More than 80,000 circuit breakers/switchers on order or in service since 1989, worldwide.

A spring type operating mechanism is used to operate the circuit breakers. The stored energy in the springs is sufficient to perform one (1) O-CO operation without recharging. The tripping springs are automatically recharged after every C operation. Duty cycle is O-0.3s-CO-10s-CO as standard.

The breakers have NEMA four (4) hole bushing terminals, made of aluminum and arranged in a horizontal plane and NEMA two (2) hole, stainless steel, grounding pads located on opposite legs of the support structure. Anchor bolts, terminal connectors and ground clamps are to be provided by others.

The circuit breakers will be supplied with a minimum of 10 'a' and 10 'b' spare auxiliary contacts available for customer use. These contacts are factory set and are not field inter-interchangeable or adjustable.

The circuit breakers have one (1) common gas density monitoring system for the three (3) poles, located outside of the control housing, subject to ambient conditions. This pressure sensitive, temperature compensated SF₆ gas density monitor has two (2) contact settings for the following functions for falling density: (1) alarm, (2) functional lockout. The contact settings are adjusted at the factory; therefore, they require no calibration and should not be adjusted in the field.

The circuit breakers have a common gas piping system with a common fill valve located outside of the control cabinet, and self-sealing type isolation valves are provided on each tank to facilitate the removal of gas from a single tank.

In the event of a loss of supply to the motor, a hand crank is included with each breaker to manually charge the spring.

The breakers will be shipped on a low step-deck or flatbed truck with bushings assembled and partially gas filled, thereby eliminating the need for a vacuum pump on site. On-site assembly consists of topping off with SF₆ gas and mounting the lower legs of the support structure.

The proposed circuit breakers have been tested according to applicable ANSI/IEEE standards. Type tests have been performed previously on a similar unit. A set of routine tests, also according to ANSI/IEEE standards, will be conducted on the circuit breakers prior to shipment from our factory in Charleroi, PA. A repetition of any of these tests or the inclusion of a test or testing procedure not covered in these standards or on our Routine Testing Report is not included in the price of the circuit breakers.

The cost of routine equipment testing at our facility is included in the breaker pricing. All other costs (i.e. travel, lodging, and meal expenses) associated with witness testing are not included.

7 Attachments

- Proposal Forms
- DT1-170 FK F1 Sample Outline & Sample Wiring Scematic
- DT1-170 FK Product Brochure
- Maintenance Schedule
- Current Transformer Curves
- Grid Solutions High Voltage Circuit Breaker Line Card
- Terms and Conditions for Sale of Products and Services Form EM 104 (Grid Solutions)

**DOCUMENT 00301
PROPOSAL**Date: 3/21/23To: Tupelo Water and Light
320 North Front Street
Tupelo, MS 38804

Gentlemen:

The undersigned, hereinafter called the "Materialman", hereby proposes to sell and deliver to Tupelo Water & Light hereinafter called the "Owner", upon the terms and conditions herein stated, the material specified in the attached Specifications dated January, 2023 for the following sum:

BASE BID:

<u>ITEM</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>TOTAL BID PRICE</u>
1	2	161 kV Outdoor Power Circuit Breakers	\$ <u>161,850.00</u>

DELIVERY:

Delivery Site: North Green Street Substation

Delivery Date: March 2024

An alternate Delivery Date of 86 to 90 weeks ARO is proposed by the Materialman. If this alternate Delivery Date is accepted by the Owner, a price reduction of \$ 0 is offered.

GENERAL:

In submitting this Proposal, the Materialman agrees as follows:

The prices set forth herein do not include any sums which are or may be payable by the Materialman on account of taxes imposed by any taxing authority upon the sale, purchase, or use of the equipment. If any such tax is applicable to the sale, purchase, or use of the equipment, the amount thereof shall be added to the purchase price and paid by the Owner.

The Materialman agrees to the terms and conditions of the Document 00531 - MATERIALS CONTRACT.

The prices set forth herein are firm if accepted by the Owner within thirty (30) days and shall include the cost of delivery to the job site. The material shall be delivered to the Delivery Site on or before the Delivery Date.

The Materialman shall be responsible for securing all permits required for shipping to the Delivery Site and shall be responsible for any damages to road and utilities or other damages caused by the Materialman or his Delivery Agent during shipment to Delivery Site.

Notice of Shipment - The Materialman shall notify the Owner at the following times:

1. 10 days prior to shipment.
2. 24 hours prior to shipment.
3. 24 hours prior to delivery.

Shipments arriving after 2:00 p.m. on weekdays or arriving on weekends or holidays shall not be

unloaded until the next working day and the Materialman shall be responsible for any demurrage.

Failure to provide notice shall result in Materialman being responsible for any demurrage charges resulting from the unavailability of equipment to unload equipment.

The Materialman agrees that all requests for time extensions shall be in writing, and that only such time extensions as are granted by the Owner in writing shall be considered.

Time is of the essence in order for the Owner to comply with established construction schedules. Should the Materialman fail to complete the terms of this Proposal by the Delivery Date, after all time extensions granted by the Owner have been added, then in that event the Owner shall have and is hereby given the right to deduct and retain out of such monies which may then be due, or which may become due and payable to the Materialman, the DAMAGE AMOUNT per calendar day as liquidated damages for each and every day that Certification is delayed beyond the Delivery Date. The Materialman and Owner agree that liquidated damages are for costs associated with project delay and not as a penalty and that proof of such losses or damages shall not be required. The DAMAGE AMOUNT shall be \$300 per day. **Capped at 5% of delayed portion of the contract.**

The GENERAL CONDITIONS and SUPPLEMENTARY CONDITIONS describe the Owner's requirements as to Performance and Payment Bonds. When the successful Bidder delivers the executed Materials contract to the Owner, it must be accompanied by the required Performance and Payment Bonds.

Proposal requirements, as outlined in the technical sections, shall be submitted with this proposal. Failure to submit requested data can result in Bid rejection.

The qualifications of the Materialman's Field Services Representative for field inspection, testing and certification shall be attached to this proposal. Include the name of the proposed field service firm, if these services are not supplied by employees of the manufacturer. A schedule of field tests, applicable ANSI standards and test limits shall be submitted by the Materialman. The qualifications of the Field Service Representatives or Field Service Firm will be included in the overall evaluation of this proposal.

In estimating the lowest cost to the Owner as one of the factors in deciding the award of an order, the Owner will consider, in addition to the price quoted in the proposal, the following:

1. Stated exceptions to the specifications.
2. Method of delivery.
3. Warranty.
4. Installation, erection and operating costs.
5. Delivery time.
6. Work history on previous projects.

Failure to submit bid evaluation data as specified can lead to bid rejection.

Title of each equipment item shall pass to the Owner upon:

1. Delivery at location specified.
2. Satisfactory inspection for in transit damage.
3. Satisfactory installation and field test.
4. Acceptance by the Owner following completion of Item 3.
5. Payment: See Document 00531 - MATERIALS CONTRACT, Article II Payment.

The Materialman shall submit bids on this PROPOSAL. Submit complete PROPOSAL in (2) two unaltered copies with all blank spaces completed. There shall be no exceptions for basic bid submitted by the Materialman; however, an alternate, with exceptions, may be bid as an attachment to a basic bid.

The Materialman acknowledges that he has received the following Addenda (insert Addenda number(s) and date(s) or NONE):

ADDENDUM NUMBER

DATE

None

EXCEPTIONS: Any and all exceptions that the Materialman takes to the attached specifications shall be **itemized on this proposal page** even though the exceptions may be covered elsewhere in the bid materials. The bidder shall indicate to which items exceptions apply or indicate no exceptions.

Specification Section

Associated with EXCEPTION

Description of Exception

* This offer is made strictly in accordance with the attached Terms and Conditions for Sale of Products and Services Form ~~EM 104~~ (Grid Solutions).

161 kV Power Circuit Breakers for North Green Street Substation – January 2023:

Document 00301:

* Liquidated damages will be \$300.00 per day capped at 5% of the delayed portion of the contract.

* Unloading onto existing concrete pads; field inspection, testing, certification and field assembly is not included in the price of the breaker.

* Bid bond and performance bond not required.

Document 00711

10.A Liquidated damages will be \$300.00 per day capped at 5% of the delayed portion of the contract.

Document 01721

3.02.D Due to the factory load, the circuit breakers cannot be held for two weeks. GE can offer to send the test results via PDF for reviewing all documents, including the factory test results prior to shipment. GE will give the customer two working days to review the test results.

Section 16353

1.04.B.1.a 170kV

1.04.B.1.b 40kA

1.04.B.1.c 40kA

1.04.B.1.d 40kA

1.04.B.1.e 100%

1.04.B.2 ~~See attached outline drawing~~

1.04.B.3 Trip and close coils: 3.5A / 125VDC, Motor: 31A inrush, 9A running at 120VAC / 425VDC

1.04.B.4 Please refer to attached CT Curves

1.04.B.5 ~~No special tools are required for installation or maintenance of the circuit breaker.~~ Therefore, no additional tools will be provided. We have included one gas regulator with fill hose per substation.

1.04.B.6 < 10 seconds

1.04.B.7 See attached maintenance schedule.

1.05.B.2.c Anchor bolt design is not the responsibility of the supplier. It is the responsibility of the customer to verify the mechanical integrity of said anchors as well as the customer's foundation according to the foundation loading requirements as specified on the GE Grid Solutions contract drawing.

2.03.B.4 Each bushing is provided with an integral aluminum NEMA four (4)-hole pad for high voltage termination. Bushing studs and stud connectors are not supplied.

2.05.A The proposed 170 kV circuit breakers do not have swing panels in the control cabinet. All control components are attached to front mounted flush panels with easy access for wiring

2.05.B.4 Shunt release are not available on the proposed breakers. Two independent trip coils are offered.

Section 16353D

1.03.K.1 Anchor bolt design is not the responsibility of the supplier. It is the responsibility of the customer to verify the mechanical integrity of said anchors as well as the customer's foundation according to the foundation loading requirements as specified on the GE Grid Solutions contract drawing.

It is understood by the undersigned that the Owner retains the privilege of accepting or rejecting all or any part of this Proposal and to waive any informalities or technicalities therein.

MATERIALMAN: GE Grid Solutions, LLC

BY: George Muchesko

TITLE: Lead Sales & Proposal Manager

MAILING

ADDRESS: 1 Power Lane

DATE: 3/29/23

Charleroi, PA 15022

TELEPHONE: 724-483-7874

STREET

ADDRESS: 1 Power Lane

FAX: _____

Charleroi, PA 15022

EMAIL: george.muchesko@ge.com

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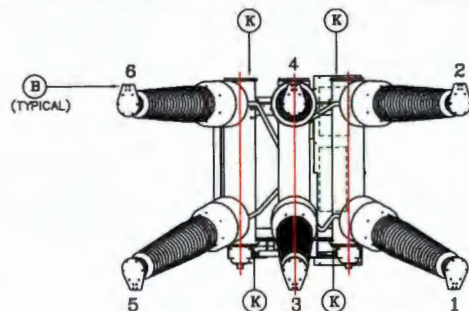
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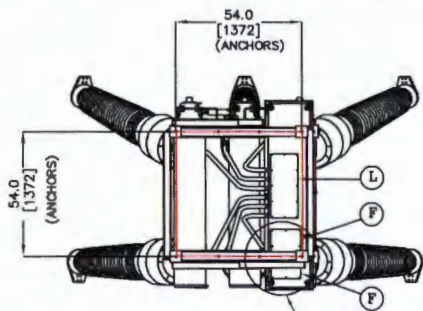
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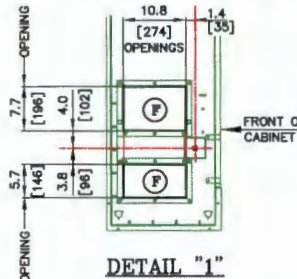
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TOP VIEW



BOTTOM VIEW



DETAIL "1"

BOTTOM VIEW
(CABLE ENTRANCE OPENINGS)RESONANT FREQUENCY
w/ 2% DAMPING

MODE	FREQUENCY
1	11.34 Hz
2	12.77 Hz
3	18.70 Hz
4	19.14 Hz
5	22.14 Hz
6	22.24 Hz
7	25.26 Hz
8	26.78 Hz
9	27.34 Hz
10	27.63 Hz
11	27.89 Hz
12	28.81 Hz
13	33.12 Hz
14	33.82 Hz

MAXIMUM DEFLECTION: 0.2" @ TOP OF TERMINALS
 QUALIFIED BY: DYNAMIC ANALYSIS
 APPROVED BY: RGF ASSOCIATES
 REPORT NUMBER: EDN-00283
 QUALIFIED TO: IEEE 693-2016-OF LEVEL-HIGH 0.5g

LEGEND:

- A1 --- MINIMUM DISTANCE FOR BUSHING REMOVAL: 30.0" [762 mm]
 A2 --- MINIMUM DISTANCE FOR INTERRUPTER REMOVAL: 85.0" [2159 mm]
 B --- NEMA 4 HOLE TERMINAL PAD
 C --- SF6 DENSITY MONITOR
 D --- SF6 FILL VALVE
 E1 --- CHARGED/DISCHARGE INDICATORS
 E2 --- OPEN/CLOSE INDICATORS & COUNTER
 F --- CABLE ENTRANCE
 G --- RATINGS NAME PLATE (EXTERNAL)
 H --- PRESSURE RELIEF DEVICE
 J --- NEMA 2 GROUND PAD (DIAMETRICALLY OPPOSED)
 K --- LIFTING LOCATIONS
 L --- MECHANISM ACCESS
 M --- BCT NAMEPLATE (INTERNAL)
 N --- EXTERNAL GFI RECEPTACLE
 P --- EMERGENCY TRIP PUSHBUTTON

TYPE: DTI-170FK-40-F1

IMPULSE WITHSTAND: 750 kV

MAXIMUM VOLTAGE: 170 kV

INTERRUPTER CURRENT RATING:
 FIRST-POLE-TO-CLEAR-FACTOR 1.5 - 31.5 kA
 FIRST-POLE-TO-CLEAR-FACTOR 1.3 - 40 kA

CURRENT RATING: 2000 A

DIMENSIONS: INCHES
mm

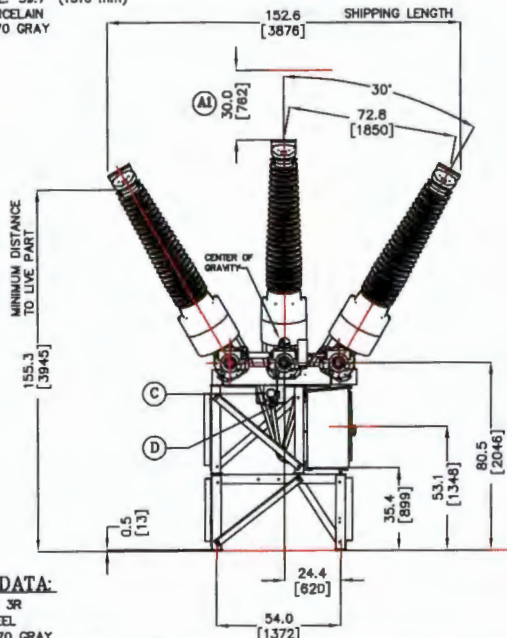
5,386 lbs. (2,444 kg) --- WEIGHT OF BREAKER
 91 lbs. (41 kg) --- WEIGHT OF SF6 GAS
 360 lbs. (163 kg) --- WEIGHT OF BCTs
 5,837 lbs. (2,646 kg) --- TOTAL WEIGHT OF BREAKER

NOTES:

- 1) FOUR (4) #3/4" [19 mm] ANCHOR BOLTS (ASTM A 36 OR GREATER)
- 2) 3.0" [76 mm] MINIMUM PROJECTION ABOVE FOUNDATION.
- 3) ANCHORING TO BE SUPPLIED BY CUSTOMER.
- 4) FOUNDATION TO BE LEVEL WITHIN 0.25" [6 mm] AT FOUR (4) BASEPLATES.
- 5) SHIM AND GROUT AS REQUIRED.
- 6) RATED SEISMIC LEVEL 0.5g OF RRS PER IEEE 693
- 7) OPERATIONAL FORCES IN ANY DIRECTION = 1112N (250 lbf)
- 8) STATIC HORIZONTAL FORCE (LONGITUDINAL) = 1250N (281 lbf)
- 9) STATIC HORIZONTAL FORCE (TRANSVERSE) = 750N (169 lbf)
- 10) STATIC VERTICAL FORCE = 1000N (225 lbf)
- 11) CENTER OF GRAVITY DIMENSIONS ARE APPROXIMATE ONLY. DIMENSIONS CAN VARY DUE TO BUSHINGS, ADDITIONAL BRACING, BCTs AND BREAKER HEIGHT.

BUSHING DATA:

CREEPAGE: 185" (4699 mm)
 STRIKE DISTANCE: 59.7" (1516 mm)
 MATERIAL: PORCELAIN
 COLOR: ANSI 70 GRAY



CONTROL

CABINET DATA:

RATING: NEMA 3R
 MATERIAL: STEEL
 COLOR: ANSI 70 GRAY

CUSTOMER: CITY OF TUPELO
 CUSTOMER ORDER No.: 00002650-000
 SUBSTATION: SOUTHWEST TUPELO SUBSTATION
 SERIAL No.: 3797260010001

MATERIAL ID:
CCDT1-170FK-F1-001ORDER No.
379726

REV.	DESCRIPTION	DRAWN	CHECKED	DATE
		W. HOLT	A. LISITA	09/27/2022
		DRAWN	CHECKED	DATE



Grid Solutions
 One Power Lane
 Charlotte, PA 15022

DRAWING No.: M379726010

SHT 1 OF 1

OUTLINE DRAWING

A

B

C


























D

A

B

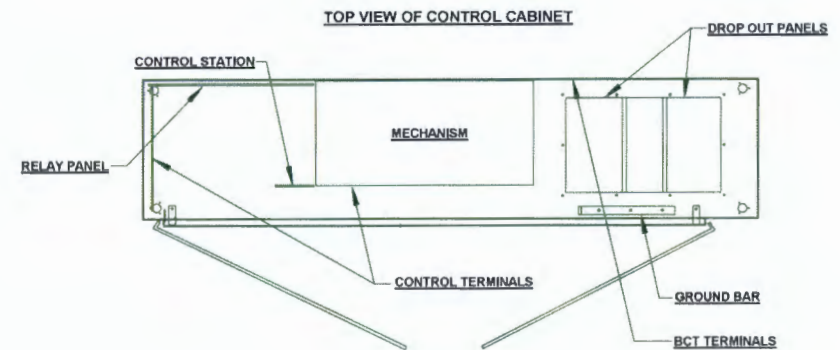
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	CIRCUIT BREAKER		FUSE PULLOUT, SLUGGED
	CABINET LIGHT		INDICATOR LIGHT
	COIL		KNIFE SWITCH
	CONTACT, NORMALLY CLOSED		MOTOR
	CONTACT, NORMALLY OPEN		PUSHBUTTON
	CONNECTOR		RESISTOR/ HEATER
	DENSITY MONITOR		TERMINAL BLOCK
	DOOR SWITCH		TERMINAL BLOCK (AUXILIARY)
	FUSE BLOCK		THERMOSTAT
	FUSE BLOCK, SLUGGED		THERMAL OVERLOAD
	FUSED DISCONNECT		TOGGLE SWITCH
	FUSED DISCONNECT, SLUGGED		TRANSFORMER
	FUSE PULLOUT		

STANDARD ANSI DESIGNATIONS

01CS BREAKER CONTROL SWITCH
23 THERMOSTAT
23X HEATER CONTACTOR
27X LOSS OF POWER RELAY
30 ANNUNCIATOR
37 UNDERCURRENT ALARM
43LR LOCAL REMOTE TRANSFER SWITCH
49 MOTOR THERMAL OVERLOAD
52a,b BREAKER AUXILIARY SWITCH
52C CLOSE PUSHBUTTON
52CC BREAKER CLOSE COIL
52T TRIP PUSHBUTTON
52TC BREAKER TRIP COIL
52X CLOSING RELAY
52Y ANTIPUMP RELAY
52-MON BREAKER CONDITION MONITOR
63G SF6 PRESSURE / DENSITY GAUGE
63GX SF6 PRESSURE / DENSITY RELAY
69 PERMISSIVE CONTROL SWITCH
69-KI KEY INTERLOCK
74CC CLOSE COIL MONITOR
74TC TRIP COIL MONITOR
79X RECLOSE DELAY RELAY
83X MOTOR TRANSFER CONTACTOR
88 MOTOR
88F MOTOR FAILURE ALARM
88LS MOTOR LIMIT SWITCH
A1L AMBER INDICATOR LIGHT
G1L GREEN INDICATOR LIGHT
HTR HEATER
R1L RED INDICATOR LIGHT



WIRING KEY

28	ES:14	ES:A1
SOURCE PIN NUMBER	DESTINATION DEVICE DESIGNATION	DESTINATION PIN NUMBER
		SECOND DESTINATION IF APPLICABLE

SHEET No.	DESCRIPTION
1	LEGEND/ TABLE OF CONTENTS
2	DC CONTROL & TRIP CIRCUITS
3	MOTOR CIRCUIT, ALARMS & SPARE CONTACTS
4	AC CONTROL SCHEMATIC
5	TERMINAL BLOCK WIRING DIAGRAM
6	MECHANISM PANEL WIRING DIAGRAM
7	RELAY PANEL WIRING DIAGRAM
8	COMPONENT LAYOUT - CONTROL CABINET
9	BILL OF MATERIAL - CONTROL CABINET
10	BUSHING CURRENT TRANSFORMER DATA
11	GAS SCHEMATIC & RATING NAMEPLATE
12	TERMINAL BLOCK & DEVICE TAGS
13	BUSHING OUTLINE

REV.	DESCRIPTION	ECN NO.	DRAWN BY	CHECKED	DATE
			W. Holt	A. Lefsa	09/26/2022
			DRAWN	CHECKED	DATE
LEGEND					

CUSTOMER: CITY OF TUPELO
CUSTOMER ORDER No.: 00002850-000
SUBSTATION: SOUTHWEST TUPELO SUBSTATION
SERIAL No.: 3797260010001

MATERIAL ID:
CCDT1-170FK-F1-001

CUSTOMER EQ. No.:

ORDER No.
379726



Grid Solutions
One Power Lane
Charlottesville, PA 15022

DRAWING No.: E379726010

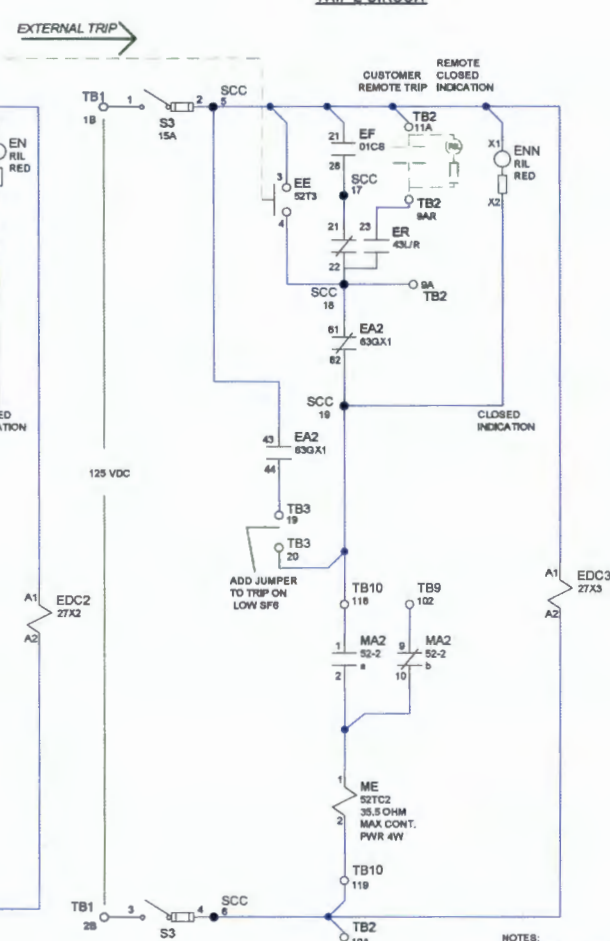
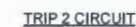
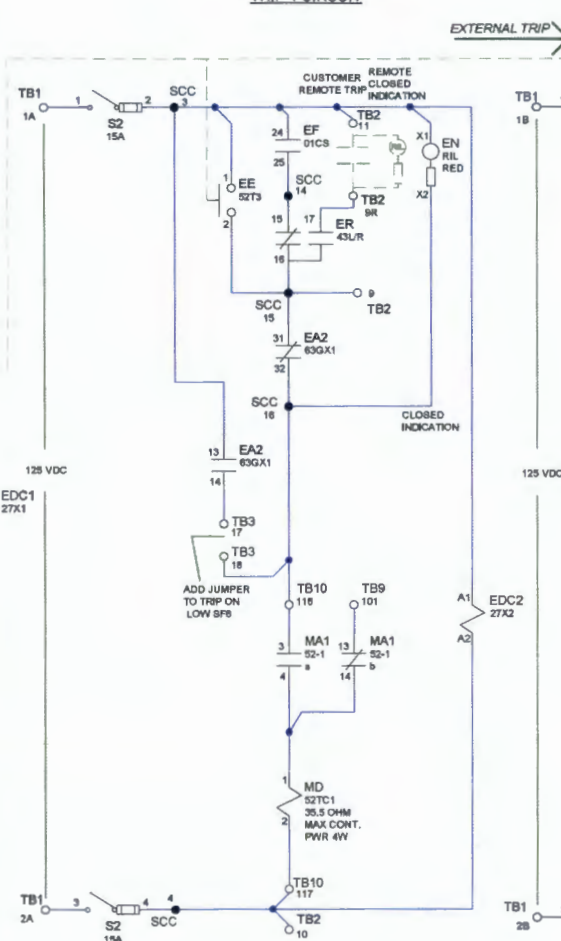
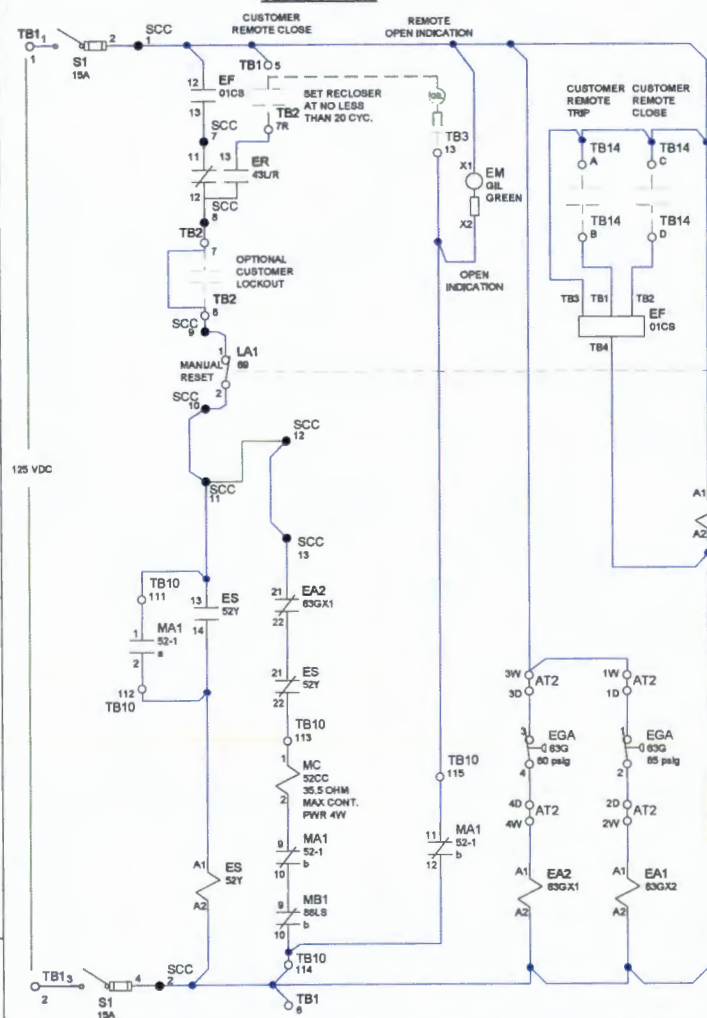
SHT 1 OF 13

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- NOTES:
- 1) ALL DEVICES SHOWN IN DE-ENERGIZED POSITION
 - 2) BREAKER SHOWN IN OPEN POSITION
 - 3) SP8 SHOWN AT ZERO PRESSURE
 - 4) CLOSING SPRING SHOWN IN CHARGED POSITION
 - 5) SCC:11 & SCC:12 ARE CONNECTED BY A 2FT SHORTING BAR
 - 6) LOCAL/REMOTE SWITCH SHOWN IN LOCAL POSITION

CUSTOMER: CITY OF TUPELO
CUSTOMER ORDER No.: 00002650-000
SUBSTATION: SOUTHWEST TUPELO SUBSTATION
SERIAL No.: 3797260010001

MATERIAL ID:
CCDT1-170FK-F1-001

ORDER No.
379726

SHT 2 OF 13

REV.	DESCRIPTION
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ECN NO.	
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DRAWN BY

CHECKED

DATE

CUSTOMER EQ. No.:

DC CONTROL SCHEMATIC

W. Holt

A. Litsa

09/26/2022

DRAWN

CHECKED

DATE _____



Grid Solutions
One Power Lane
Charleroi, PA 15022

DRAWING No.: E379726010

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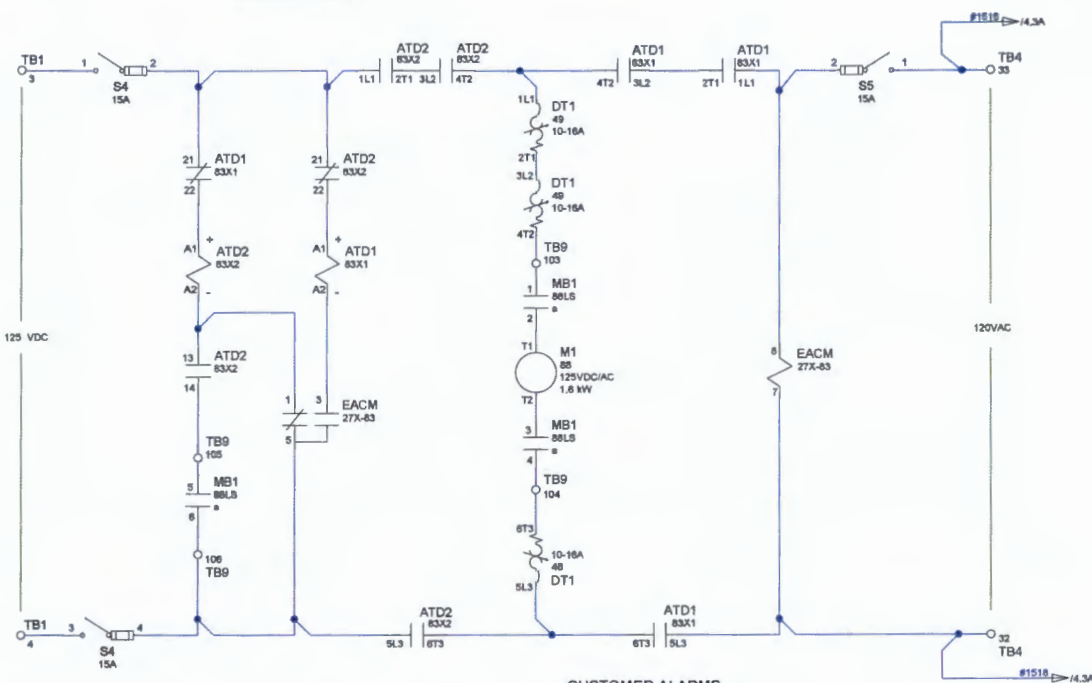
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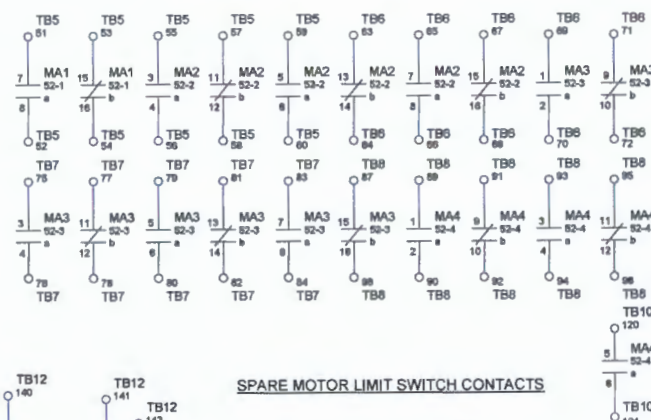
MOTOR CIRCUIT



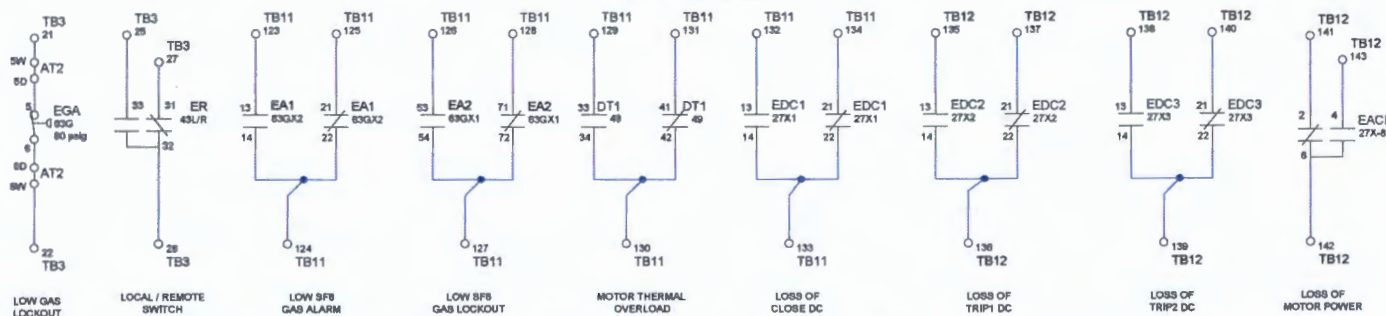
SPARE TERMINAL BLOCKS FOR CUSTOMER USE



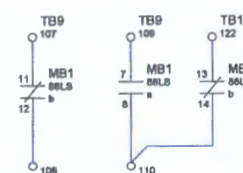
SPARE AUXILIARY SWITCHES FOR CUSTOMER USE



CUSTOMER ALARMS



SPARE MOTOR LIMIT SWITCH CONTACTS



- NOTES:
- 1) ALL DEVICES SHOWN IN DE-ENERGIZED POSITION
 - 2) BREAKER SHOWN IN OPEN POSITION
 - 3) SFS SHOWN AT ZERO PRESSURE
 - 4) CLOSING SPRING SHOWN IN CHARGED POSITION
 - 5) SCC:11 & SCC:12 ARE CONNECTED BY A 2PT SHORTING BAR
 - 6) LOCAL/REMOTE SWITCH SHOWN IN LOCAL POSITION

CUSTOMER: CITY OF TUPELO
 CUSTOMER ORDER No.: 00002650-000
 SUBSTATION: SOUTHWEST TUPELO SUBSTATION
 SERIAL No.: 3797260010001

MATERIAL ID:
 CDDT1-170FK-F1-001

ORDER No.
 379726

REV. DESCRIPTION

ECN NO.

DRAWN BY

CHECKED

DATE

CUSTOMER EQ. No.:

MOTOR CIRCUIT AND ALARMS

W. Holt

A. Laita

09/26/2022

DRAWN

CHECKED

DATE



Grid Solutions
 One Power Lane
 Charleston, PA 15022

DRAWING No.: E379726010

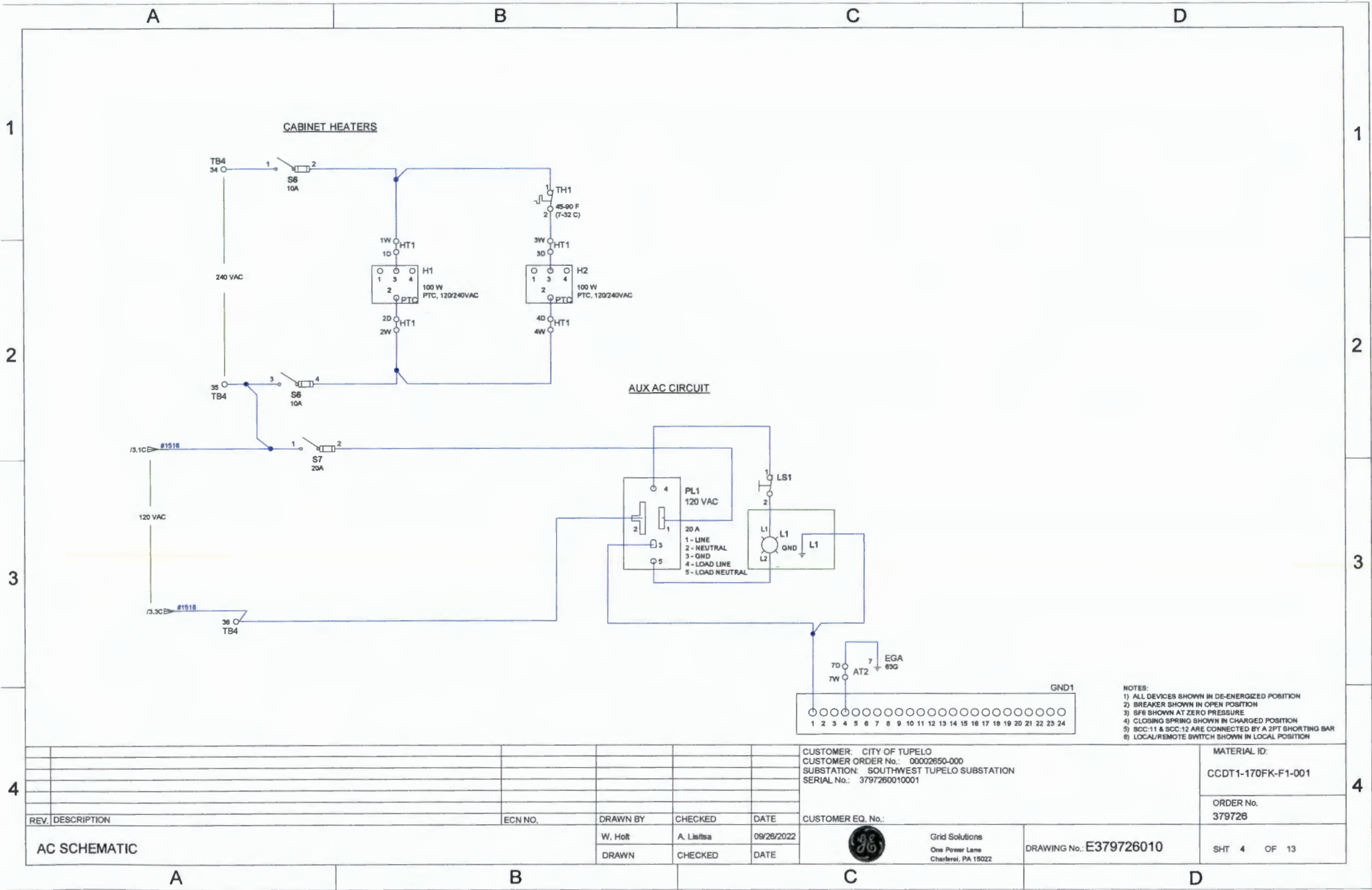
SHT 3 OF 13

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A

B

C

D

TERMINAL BLOCK WIRING

DC PWR CLOSE DC PWR TRIP 1 DC PWR TRIP 2 MOTOR POWER CLOSE (+) BUS CLOSE (-) BUS SPARE	TB1	
	S1:1	1
	S1:3	2
	S2:1	1A
	S2:3	2A
	S3:1	1B
	S3:3	2B
	S4:1	3
	S4:3	4
	SCC:1	5
CLOSE (+) BUS CLOSE (-) BUS SPARE	SCC:2	6
	B1	
	B2	

REMOTE CLOSE (BYPASS 43U/R) REMOTE CLOSE CUST INTERLOCK REMOTE PROT TRIP 1 REMOTE TRIP 1 REMOTE PROT TRIP 2 REMOTE TRIP 2 TRIP 1 (-) BUS TRIP 2 (-) BUS TRIP 1 (+) BUS TRIP 2 (+) BUS SPARE	TB2	
	SCC:8	7 TB2:6
	ER:13	7R TB2:6
	SCC:9	8 TB2:7
	SCC:15	9
	ER:17	9R
	SCC:18	9A
	ER:23	9AR
	SCC:4	10
	SCC:6	10A
TRIP 1 (-) BUS TRIP 2 (-) BUS TRIP 1 (+) BUS TRIP 2 (+) BUS SPARE	SCC:3	11
	SCC:5	11A
	B3	

REMOTE OPEN INDICATION TRIP ON LOW SPB TRIP ON LOW SPB LOW GAS LOCKOUT SPARE LOCAL REMOTE SWITCH	TB3	
	EM:X2,TB10:115	13
	EA2:14	17
	SCC:18	18
	EA2:44	19
	SCC:19	20
	AT2:5W	21
	AT2:6W	22
		23
		24
ER:33 ER:32 ER:31		25
		26
		27

120VAC MOTOR POWER 240 VAC INPUT CABINET HEATER POWER 120VAC AUXILIARY POWER	TB4	
	EACM:7,TB4:36	32
	95:1,97:1	33
	96:1	34
	98:3,97:1	35
TB4:32,FL1:2		36
		37

TB11	
123	EA1:13
124	EA1:22
125	EA1:21
126	EA2:53
127	EA2:72
128	EA2:71
129	DT1:33
130	DT1:42
131	DT1:41
132	EDC1:13
133	EDC1:22
134	EDC1:21

TB12	
135	EDC2:13
136	EDC2:22
137	EDC2:21
138	EDC3:13
139	EDC3:22
140	EDC3:21
141	EACM:2
142	EACM:6
143	EACM:4
144	
145	
146	

TB13	
147	
148	
149	
150	
151	
152	
153	
154	
155	
156	
157	
158	

TB14	
A	EF:TB3,TB14:C
B	EF:TB1
C	EDC1:A1,TB14:A
D	EF:TB2
E	
F	

TB10	
MB1:13	122
MA4:6	121
MA4:5	120
ME2	118 SCC:8
MA2:1	118 SCC:19
MD2	117 SCC:4
MA1:3	116 SCC:16
MA1:11	115 TB5:3
MB1:10	MA1:12
MA1:12	114 SCC:2
NC1	113 EB:22
MA1:2	112 EB:14
MA1:1	111 EB:13

TB7	
86	
85	
84	MA3:9
83	MA3:7
82	MA3:14
81	MA3:13
80	MA3:8
79	MA3:5
78	MA3:12
77	MA3:11
76	MA3:4
75	MA3:3

TB9	
MB1:14	MB1:6
MB1:7	100
MB1:12	100
MB1:11	107
MB1:6	106
MA4:4	EACM:5
MB1:5	105
MB1:4	104
MB1:1	103
MB1:1	103
DT1:4T2	
MA1:13	101
MA1:13	100
	99

TB6	
74	
73	
72	MA3:10
71	MA3:9
70	MA3:2
69	MA3:1
68	MA2:18
67	MA2:15
66	MA2:9
65	MA2:7
64	MA2:14
63	MA2:13

TB8	
98	
97	
96	MA4:12
95	MA4:11
94	MA4:4
93	MA4:3
92	MA4:10
91	MA4:9
90	MA4:2
89	MA4:1
88	MA3:16
87	MA3:15

TB5	
62	
61	
60	MA2:9
59	MA2:5
58	MA2:12
57	MA2:11
56	MA2:4
55	MA2:5
54	MA1:18
53	MA1:15
52	MA1:8
51	MA1:7

NOTES:

- 1) ALL AC WIRING (INCL. MOTOR CIRCUIT) TO BE 12GA GRAY SIS VV1
- 2) ALL DC WIRING TO BE 14GA GRAY SIS VV1
- 3) ALL GROUND WIRES TO BE 12SA GREEN SIS VV1
- 4) WIRE MARKERS TO BE SHRINK-TYPE AND TO SHOW SAME-END/OPPOSITE-END DESIGNATION
- 5) WIRE LUGS ARE TO BE UNINSULATED RING-TYPE (EXCEPT FOR DEVICES THAT DO NOT ACCEPT RING-TYPE TERMINALS)
- 6) SCC:11 & SCC:12 ARE CONNECTED BY A 2PT SHORTING BAR

REV. DESCRIPTION

ECN NO.

DRAWN BY

CHECKED

DATE

CUSTOMER: CITY OF TUPELO
CUSTOMER ORDER No.: 00002650-000
SUBSTATION: SOUTHWEST TUPELO SUBSTATION
SERIAL No.: 3797260010001

MATERIAL ID:
CCDT1-170FK-F1-001

ORDER No.
379726

TERMINAL BLOCK WIRING DIAGRAM

CUSTOMER EQ. No.:



Grid Solutions
One Power Lane
Charlottesville, PA 15022

DRAWING No.: E379726010

SHT 5 OF 13

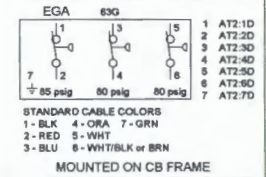
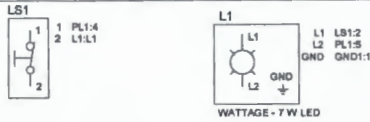
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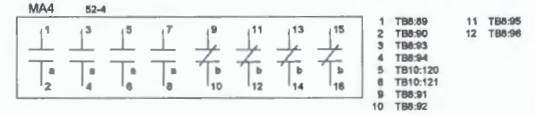
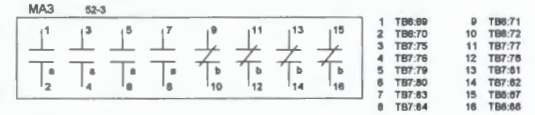
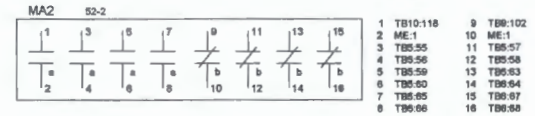
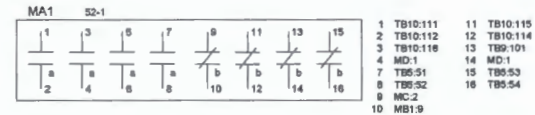
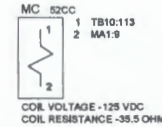
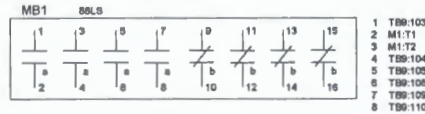
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MECHANISM PANEL

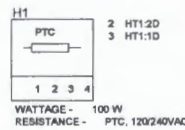
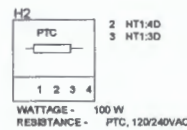
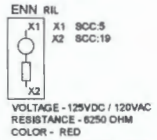
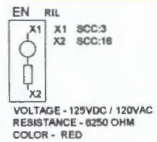
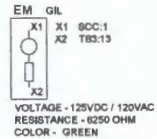
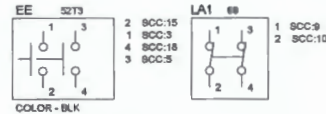
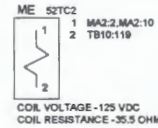
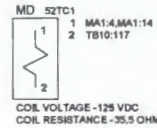
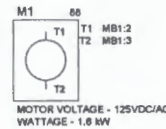


CONTROL STATION

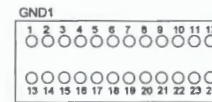
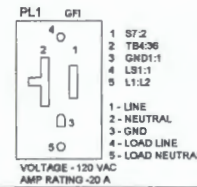
DECK	CONTACTS FRONT END	SWITCH POSITION				
		TRSP	nat	nac	CLOSE	
1	12-13				X	TB1:8
1	16-17				X	TB2:1B14-D
2	21-22	X				TB4:EDC1:A2
2	24-25	X				TB3:1B14-A
3	31-32		X	X		12 SCC:1
3	35-36		X	X		13 SCC:7
4	42-43			X	X	21 SCC:5
4	46-47			X	X	26 SCC:17
5	51-52	X	X			24 SCC:3
5	55-56	X	X			25 SCC:14



DECK	CONTACTS FRONT END	SWITCH POSITION		
		LOCAL	REMOTE	
1	12-13	X	X	11 SCC:7
1	16-17	X	X	12 SCC:8
2	22-23	X	X	13 TB2:7R
2	26-27	X	X	15 SCC:14
3	32-33	X	X	16 SCC:15
3	36-37	X	X	17 TB2:9R



HT1			
H1:3	1D	1W	S6.2,HT1:1
H1:2	2D	2W	S6.4,HT1:4W
H2:3	3D	3W	TH1:2
H2:2	4D	4W	HT1:2W
	5D	5W	
	6D	6W	



- NOTES:
- 1) ALL AC WIRING (INCL. MOTOR CIRCUIT) TO BE 12GA GRAY SIS VWI
 - 2) ALL DC WIRING TO BE 14GA GRAY SIS VWI
 - 3) ALL GROUND WIRES TO BE 12GA GREEN SIS VWI
 - 4) WIRE MARKERS TO BE SHRINK-TYPE AND TO SHOW SAME-END/OPPOSITE-END DESIGNATION
 - 5) WIRE LUGS ARE TO BE UNINSULATED RING-TYPE (EXCEPT FOR DEVICES THAT DO NOT ACCEPT RING-TYPE TERMINALS)
 - 6) SCC:11 & SCC:12 ARE CONNECTED BY A 2PT SHORTING BAR

REV. DESCRIPTION

ECN NO.

DRAWN BY

CHECKED

DATE

CUSTOMER EQ. No.:

MECHANISM AND CONTROL STATION WIRING DIAGRAM

W. Holt

A. Laita

09/26/2022

DRAWN

CHECKED

DATE

CUSTOMER: CITY OF TUPELO
CUSTOMER ORDER No.: 00002650-000
SUBSTATION: SOUTHWEST TUPELO SUBSTATION
SERIAL No.: 3797260010001Grid Solutions
One Power Lane
Charlottesville, PA 15022

DRAWING No.: E379726010

MATERIAL ID:

CCDT1-170FK-F1-001

ORDER No.

379726

SHT 6 OF 13

A

B

C

D

A

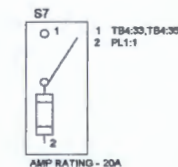
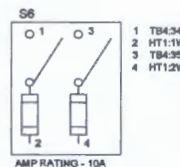
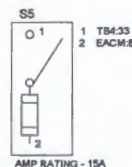
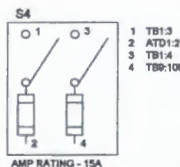
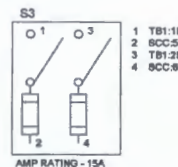
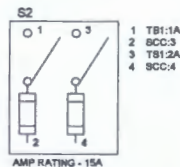
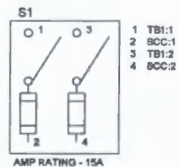
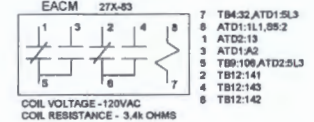
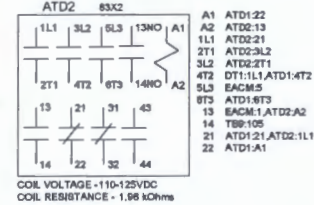
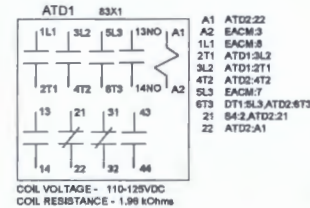
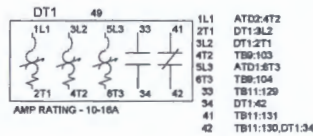
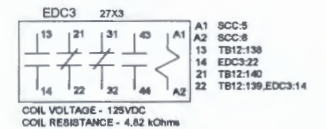
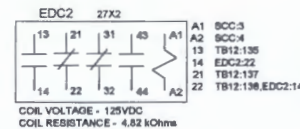
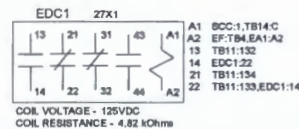
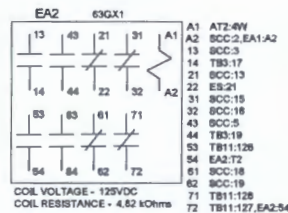
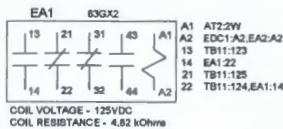
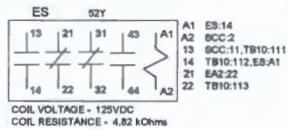
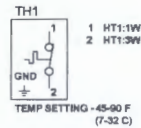
B

C

D

RELAY WIRING

1	BM-A1,81;2,AT2-3W,EDC1-A1,TB1-5,EF-12
2	81;4,TB10-114,TB1-6,EA2-A2,EA2
3	TB1-11,EN-A1,EDC2-A1,EF-24,EE-1,ES-2,EA2-13
4	TB10-117,TB2-10,EDC2-A2,EA2-4
5	ENH-A1,SS-2,TB2-11A,EDC3-A1,EF-21,EE-3,EA2-43
6	83;4,TB2-10A,TB10-119,EDC3-A2
7	TB2-7,ER-12
8	TB2-8,LA1-1
9	8CC-11,LA1-2
10	8CC-13,8CC-10
11	ES-13,8CC-10
12	8CC-13
13	8CC-12,EA2-21
14	ER-15,EF-25
15	EA2-31,ER-16,TB2-9,EE-2
16	EN-A2,TB1-18,TB10-116,EA2-32
17	EF-28,ER-21
18	EA2-61,TB2-9A,ER-22,EE-4
19	ENH-A2,TB10-118,TB3-20,EA2-62



- NOTES:
- 1) ALL AC WIRING (INCL. MOTOR CIRCUIT) TO BE 12GA GRAY SIS VWI
 - 2) ALL DC WIRING TO BE 14GA GRAY SIS VWI
 - 3) ALL GROUND WIRES TO BE 12GA GREEN SIS VWI
 - 4) WIRE MARKERS TO BE SHRINK-TYPE AND TO SHOW SAME END-OPPOSITE-END DESIGNATION
 - 5) WIRE LUGS ARE TO BE UNINSULATED RING-TYPE (EXCEPT FOR DEVICES THAT DO NOT ACCEPT RING-TYPE TERMINALS)
 - 6) SCC-11 & SCC-12 ARE CONNECTED BY A 2PT SHORTING BAR

REV. DESCRIPTION

ECN NO.

DRAWN BY

CHECKED

DATE

CUSTOMER: CITY OF TUPELO
 CUSTOMER ORDER No.: 00002650-000
 SUBSTATION: SOUTHWEST TUPELO SUBSTATION
 SERIAL No.: 379726010001

MATERIAL ID:

CCDT1-170FK-F1-001

ORDER No.

379726

RELAY PANEL WIRING DIAGRAM

DRAWN

CHECKED

DATE

CUSTOMER EQ. No.:



Grid Solutions
 One Power Lane
 Charlotte, NC 15022

DRAWING No.: E379726010

SHT 7 OF 13

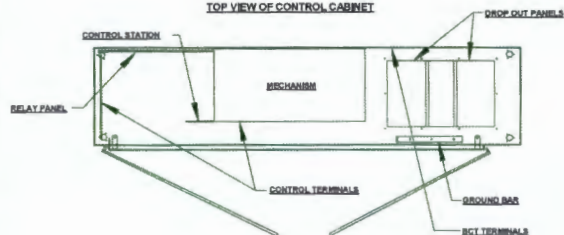
A

B

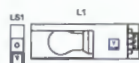
C

D

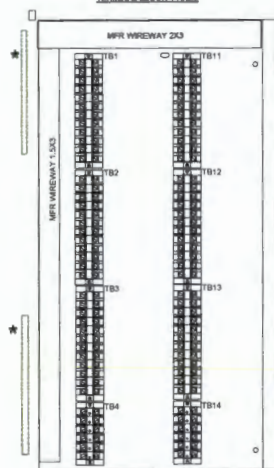
TOP VIEW OF CONTROL CABINET



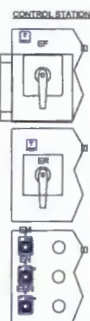
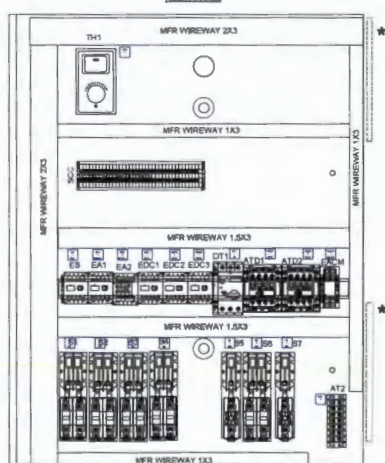
MANUFACTURING NOTES:
 1) DEVICES TO BE MARKED WITH ENGRAVED PLASTIC TAGS.
 2) DIN RAIL TO BE PER SPEC 1-4-19, 8P1.
 3) POSITION INDICATOR TAGS ATTACHED WITH STAINLESS STEEL SCREWS.
 4) [1] INDICATES MFG. TO INSTALL EDGE GUARDING AS REQUIRED.
 5) SOC-11 & SOC-12 ARE CONNECTED BY A 2PT SHORTING BAR.
 6) MECHANISM OPERATION COUNTER TO INCREMENT ON CB OPENING.



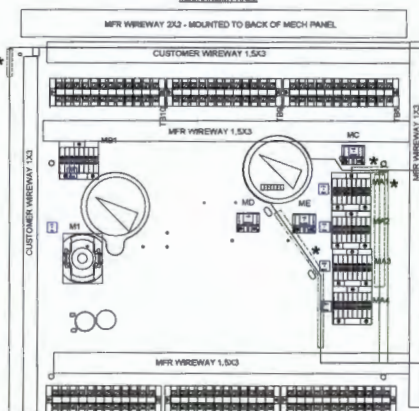
TERMINAL BLOCK PANEL



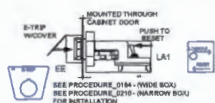
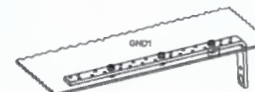
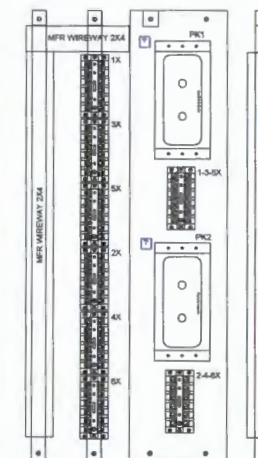
RELAY PANEL



MECHANISM PANEL



MOUNTED TO ACCESS PANEL



PL1



MOUNTED THROUGH CABINET

REV. DESCRIPTION

ECN NO.

DRAWN BY

CHECKED

DATE

CUSTOMER: CITY OF TUPELO
 CUSTOMER ORDER No.: 00002850-000
 SUBSTATION: SOUTHWEST TUPELO SUBSTATION
 SERIAL No.: 3797260010001

MATERIAL ID:
 CCDT1-170FK-F1-001

ORDER No.
 379726

COMPONENT LAYOUT

DRAWN

CHECKED

DATE

CUSTOMER EQ. No.:



Grid Solutions
 One Power Lane
 Charlotte, PA 15022

DRAWING No.: E379726010

SHT 8 OF 13

A

B

C

D

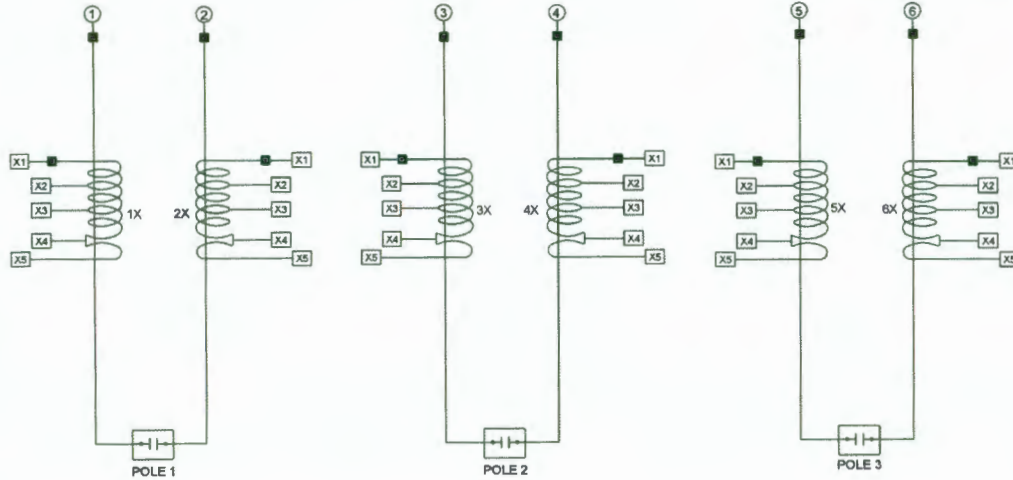
A				B		C		D	
ITEM	QTY	SAP #	MFR #	MFR	DESCRIPTION	DEVICE ID			
001	003	CC410504-017	EB25B12	GENERAL ELECTRIC	TERMINAL BLOCK 12PT	TB11, TB12, TB13			
002	003	CC410504-017	EB25B12	GENERAL ELECTRIC	TERMINAL BLOCK 12PT	TB1, TB2, TB3			
003	002	CC410504-019	EB25B06	GENERAL ELECTRIC	TERMINAL BLOCK 6PT	TB14, TB4			
004	008	CC410504-003	ES27B06S	GENERAL ELECTRIC	TERMINAL BLOCK 6PT, SHORTING	2X, 3X, 4X, 5X, 6X, 1-3-5X, 1X, 2-4-6X			
005	001	CC410504-009	1438	C3CONTROLS	PUSH BUTTON COVER-30MM	EE			
006	002	CC410541	1-410-541	GRID SOLUTIONS	PK2 BLOCK M/G BRACKET	PK1, PK2			
007	001	CC410629-011	24203D 10D2L24A	ELECTROSWITCH	CONTROL SWITCH, LOCAL/REMOTE 3 STAGE	ER			
008	002	CC410630-050	MRL125DLR-MPLLRD	C3CONTROLS	LED INDICATOR LIGHT, RED, 125VDC	EN, ENN			
009	001	CC410630-053	MRL125DLG-MPLLRD	C3CONTROLS	LED INDICATOR LIGHT, GREEN, 125VDC	EM			
010	001	CC410632-019	1-410-832-P19	GRID SOLUTIONS	CABINET LIGHT	L1			
011	001	CC417123-001	E69-30A	CHERRY	DOOR SWITCH, 10A, 125/250VAC	LS1			
012	001	CC410634-009	TSA901	ELECTROMODE	ADJUSTABLE THERMOSTAT 45-90F (7-32C)	TH1			
013	002	CC410635-010	201-J	STATES	KNIFE SWITCH 1 POLE	S5, S7			
014	005	CC410635-009	202-AW	STATES	KNIFE SWITCH 2 POLE	S1, S2, S3, S4, S6			
015	001	CC410640-101	TP7018	THEPITT	RECEPTACLE, ENCLOSURE	TH1			
016	001	CC410640-019	IH3-1	THOMAS & BETTS / RED DOT	RECEPTACLE, ENCLOSURE	PL1			
017	001	CC410640-031	BWFFG-1BCV	HUBBELL	RECEPTACLE, WEATHERPROOF COVER	PL1			
018	001	CC410640-005	GF5352A	HUBBELL	RECEPTACLE, GFI, 120VAC, 20A, NEMA 5-20R	PL1			
019	008	CC410641-073	CLUPFIX35-5	PHOENIX	END CLAMP	END10, END31, END32, END33, END34, END35, END36			
						END37			
020	002	CC410649-001	8422120G4	GENERAL ELECTRIC	TEST SWITCH, PK2	PK1, PK2			
021	002	CC410650-035	1-410-650-P35	BUSSMANN	FUSE, 10A, CLASS RK5	S6, S6			
022	009	CC410650-006	1-410-650-P6	GRID SOLUTIONS	FUSE, 15A, CLASS RK5	S1, S1, S2, S2, S3, S3, S4, S4, S5			
023	001	CC410650-007	1-410-650-P7	GRID SOLUTIONS	FUSE, 20A, CLASS RK5	S7			
024	001	CC411956	8857DB - 188-2C22	ELECTROSWITCH	CONTROL SWITCH, CSR 125 VDC	EF			
025	012	CC416091	1-416-091	GRID SOLUTIONS	COPPER STRAP	S1, S1, S2, S2, S3, S3, S4, S4, S5, S6, S6, S7			
026	001	CC416206-004	1-416-206-P4	GRID SOLUTIONS	TERMINAL BLOCK COVER AUX 6PT	HT1			
027	001	CC416868-001	1-416-868-P1	GRID SOLUTIONS	PUSH BUTTON / IND LITE BRACKET	17			
028	002	CC416868-002	1-416-868-P2	GRID SOLUTIONS	CONTROL SWITCH BRACKET	18, 19			
029	001	CC417056-001	1-417-056-P1	GRID SOLUTIONS	SWITCH BRACKET	LS1			
030	001	CC417294-001	1-417-294-G1	GRID SOLUTIONS	SPRING CHARGE MOTOR FOR FK3-1/131	M1			
031	001	CC417459-004	1-417-459-P4	GRID SOLUTIONS	ANNUNCIATOR PANEL / PENN UNION 6PT TB - FK- NARROW	PAN19			
032	001	CC990024-008	2-990-024-P8	WKA	DENSITY MONITOR (98.6,85.80) PSIG-BAR SCALE - PURE SP6	EGA			
033	001	CC990035-001	2-990-035-P1	GRID SOLUTIONS	MECHANISM PANEL	PAN11			
034	001	CC990156-003	2-990-156-P3	GRID SOLUTIONS	DT72.5 RELAY PANEL, VERSION 3	PAN17			
035	003	CC991268-001	2-991-268-P1	GRID SOLUTIONS	6PT TB MOUNTING STRIP-NEW	PAN12, PAN14, PAN22			
036	001	CC410748-001	TB206	BUSSMANN	AUX. TERMINAL BLOCK, 6 PT + COVER	HT1			
037	001	CC410748-003	TB207	BUSSMANN	AUX. TERMINAL BLOCK, 7 PT	AT2			
038	001	CC02678-001	CC02678-001	GRID SOLUTIONS	E-TRIP / 69 BLOCK	LA1			
039	001	CC410508-011	HPB0-FCBK-NO-NO	C3CONTROLS	PUSHBUTTON, BLACK, 2NO, LOCKING CVR	EE			
040	002	CC410633-019	CS 06010-0-00	STEGO	ANTICONDENSATION HEATER PTC 100W 120/240VAC	H1, H2			
041	001	CC410638-005	ER204-73	CARLING TECHNOLOGIES	PERMISSIVE CONTROL SWITCH	LA1			
042	002	CC410655-402	300-S18N30ZQ10	C3CONTROLS	CONTACTOR 125VDC, 3NO, 1NO AUX CONT.	ATD1, ATD2			
043	004	CC410655-457	300-SSA11	C3CONTROLS	AUXILIARY CONTACT	ATD1, ATD1, ATD2, ATD2			
044	001	CC410749-401BR	300-C16N222D	C3CONTROLS	CONTROL RELAY 4NO 4NC (125 VDC)	EA2			
045	005	CC410749-401BR	300-C16N222D	C3CONTROLS	CONTROL RELAY 2NO 2NC (125 VDC)	EA1, EDC1, EDC2, EDC3, ES			
046	001	CC410749-408	300-CFA22	C3CONTROLS	AUXILIARY CONTACT	EA2			
047	001	CC410749-436	GPRA-B2C10D-3	C3CONTROLS	CONTROL RELAY 2 FORM "C", 120VAC	EACM			
048	001	CC410749-498	GPRA-SB08U1	C3CONTROLS	C3 SQUARE MINI 8 BLADE BASE SOCKET	EACM			
049	001	CC410749-498	GPRA-RC2	C3CONTROLS	C3 SQUARE MINI BASE RETAINING CLIP	EACM			
050	001	CC417125-005	BPA15C/CDM/500V/LED	FEIT ELECTRIC	LIGHT BULB 7W/120VAC, LED, CUL	L1			
051	001	CC966188-202	330-125S2U16	C3CONTROLS	MOTOR CIRCUIT CONTROLLER, 10-16A	DT1			
052	001	CC966188-204	330-SA11S25	C3CONTROLS	AUX CONTACT FOR MOTOR CIRCUIT CONTROLLER	DT1			
053	001	CC410851-102	LFH250302P	UTTELFUSE	FUSED KNIFE SWITCH 2 POLE, 10A	S6			
054	001	CC410851-103	LFH250301P	UTTELFUSE	FUSED KNIFE SWITCH 1 POLE, 15A	S5			
055	004	CC410851-102	LFH250302P	UTTELFUSE	FUSED KNIFE SWITCH 2 POLE, 15A	S1, S2, S3, S4			
056	001	CC410851-103	LFH250301P	UTTELFUSE	FUSED KNIFE SWITCH 1 POLE, 20A	S7			
057	001		GROUND_BAR	GRID SOLUTIONS	GROUND BAR, 24PT	GND1			
058	003	CC410504-017	EB25B12	GENERAL ELECTRIC	TERMINAL BLOCK 12PT	TB5, TB6, TB7			
059	003	CC410504-017	EB25B12	GENERAL ELECTRIC	TERMINAL BLOCK 12PT	TB10, TB8, TB9			
060	003	CC49.102.110-20	49.102.110-20	GRID SOLUTIONS	COIL (125 VDC)	MC, MD, ME			
061	005	CC49.105.100-01	49.105.100-01	GRID SOLUTIONS	AUXILIARY SWITCH FK3-X	MA1, MA2, MA3, MA4, MB1			
062	001	CC417925-002	1-417-925-G2	GRID SOLUTIONS	STANDARD CIRCUIT CONNECTOR	SCC			
</									

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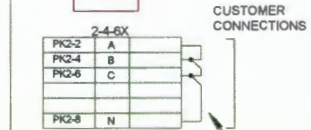
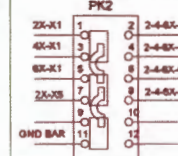
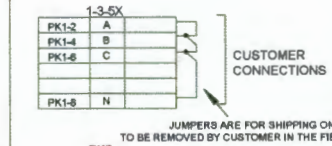
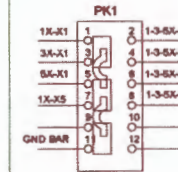
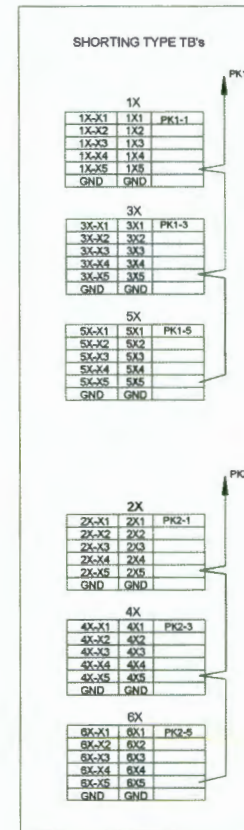
BCT NAMEPLATE

		RATIO: 2000:5 MR ACCURACY: C400 FREQUENCY: 60 Hz RATING FACTOR: 2.0 ID #: CC417048-10024G POSITION: 1X ~ 6X																																					
CT MFR. GENERAL ELECTRIC		<table border="1"> <tr> <td>X3-X4</td> <td>300:5</td> <td></td> <td></td> </tr> <tr> <td>X1-X2</td> <td>400:5</td> <td></td> <td></td> </tr> <tr> <td>X4-X5</td> <td>500:5</td> <td></td> <td></td> </tr> <tr> <td>X2-X3</td> <td>800:5</td> <td></td> <td></td> </tr> <tr> <td>X2-X4</td> <td>1100:5</td> <td></td> <td></td> </tr> <tr> <td>X1-X3</td> <td>1200:5</td> <td></td> <td></td> </tr> <tr> <td>X1-X4</td> <td>1500:5</td> <td></td> <td></td> </tr> <tr> <td>X2-X5</td> <td>1800:5</td> <td></td> <td></td> </tr> <tr> <td>X1-X5</td> <td>2000:5</td> <td></td> <td></td> </tr> </table>		X3-X4	300:5			X1-X2	400:5			X4-X5	500:5			X2-X3	800:5			X2-X4	1100:5			X1-X3	1200:5			X1-X4	1500:5			X2-X5	1800:5			X1-X5	2000:5		
X3-X4	300:5																																						
X1-X2	400:5																																						
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X2-X3	800:5																																						
X2-X4	1100:5																																						
X1-X3	1200:5																																						
X1-X4	1500:5																																						
X2-X5	1800:5																																						
X1-X5	2000:5																																						
BUSHING 1 2 3 4 5 6 X X X X X X																																							

BCT NAMEPLATE NOTES:
 1) NAMEPLATE MATERIAL: ANODIZED ALUMINUM
 2) NAMEPLATE LOCATION: INTERNAL
 3) NAMEPLATE DIMENSIONS AS SHOWN ON DRAWING 1_416_218_P3/4
 4) NAMEPLATE IS TO BE ATTACHED WITH ALUMINUM RIVETS.

BCT WIRING

NOTE:
 CTs TO BE GROUNDED ONLY WHEN
 PK BLOCK IS "PULLED"



CT WIRING NOTES:
 1) LEADS TO BE TERMINATED WITH UNINSULATED TYPE LUGS.
 2) ALL CT LEADS ARE TO BE SHORTED BEFORE SHIPMENT WHT-BLK-GND
 (IF LEADS ARE NOT COLOR CODED SHORT THE FIRST LEAD-LEAST LAST LEAD-GROUND)
 USING BCT TERMINAL BLOCK INTEGRATED SHORTING BAR.
 3) ALL BCT LEADS ARE 10GA WIRE.
 4) ALL GROUND WIRES ARE 10GA GREEN SIS WIRE.
 5) WIRES FROM CT SHORTING BLOCK TO PK-1 & PK-2 TO BE LONG ENOUGH
 TO REACH ANY POINT ON THE SHORTING BLOCK.

CUSTOMER: CITY OF TUPELO
 CUSTOMER ORDER No.: 00002650-000
 SUBSTATION: SOUTHWEST TUPELO SUBSTATION
 SERIAL No.: 3797260010001

MATERIAL ID:
 CCDT1-170FK-F1-001

ORDER No.
 379726

REV.	DESCRIPTION	ECN NO.	DRAWN BY	CHECKED	DATE
	NAMEPLATE - BCT WIRING DIAGRAM		W. Holt	A. Lisitsa	09/26/2022
			DRAWN	CHECKED	DATE



Grid Solutions
 One Power Lane
 Charleston, PA 15022

DRAWING No. E379726010

SHT 10 OF 13

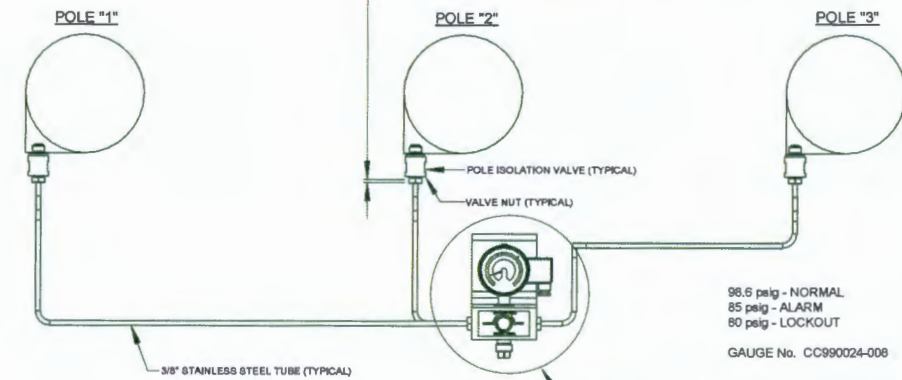
A

B

C

D

SF6 GAS SCHEMATIC



FILL HOSE & REGULATOR DETAIL

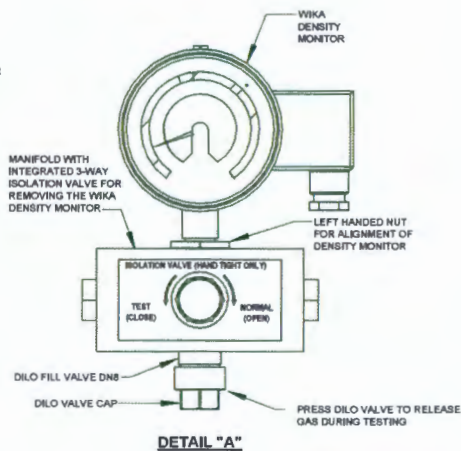


POLE ISOLATION VALVE DETAIL



NOTES:

- 1) ALL TUBING IS 3/8" STAINLESS.
- 2) GAS SAMPLING CAN BE DONE THROUGH FILL VALVE.
- 3) POLE ISOLATION VALVES USED TO ISOLATE TANK FROM GAS PIPING.
- 4) PRESSURE SWITCHES ARE LOCATED INSIDE THE DENSITY GAUGE HOUSING



RATINGS NAMEPLATE

		TYPE	DT1-170FK-40-F1	CUSTOMER P.O.	00002650-000
		SERIAL NUMBER	379726	ORDER NUMBER	379726
		MANUFACTURE DATE		INSTRUCTION BOOK No.	IB-DT12FK
				PARTS LIST No.	379726-010
				WIRING DIAGRAM	E379726010
RATED MAXIMUM VOLTAGE		RATED INTERRUPTING TIME	170 kV	SF6 PRESSURE (at 20° C / 68° F)	
RATED VOLTAGE RANGE FACTOR (K)		RATED SHORT CIRCUIT CURRENT	1.0	RELATIVE PRESSURE	
RATED FREQUENCY		- TERMINAL FAULT	80 Hz	-NORMAL OPERATING PRESSURE	
DUTY CYCLE		- 90% SLF WITH 0.4F _{Lg} CAPACITANCE (WITHIN 100ms)	0-4.3+CO-15+CO	-LOW PRESSURE ALARM	
RATED CONTINUOUS CURRENT		- FIRST POLE TO CLEAR FACTOR	2000 A	-MINIMUM PRESSURE	
CAPACITANCE CURRENT SWITCHING		- CLOSING, LATCHING & SHORT TIME CARRYING	100 kA	WEIGHT OF GAS	
-VOLTAGE FACTOR		TEMPERATURE RANGE	30°C to 40°C	TOTAL WEIGHT	
-LINE CHARGING		SHORT CIRCUIT CURRENT WITHSTAND DURATION	3s	MECHANISM TYPE	
-ISOLATED BANK		% DC COMPONENT	55.2%	CONTROL VOLTAGE	
-BACK-TO-BACK		FULL WAVE IMPULSE WITHSTAND	750 kV	-CLOSING	
-INRUSH PEAK		ALTITUDE	NOT TO EXCEED 3300FT ABOVE SEA LEVEL	-TRIPPING	
-INRUSH FREQUENCY				-MOTOR	
OUT-OF-PHASE SWITCHING				-CABINET HEATERS	
ONE POWER LANE CHARLOTTE, PA 15022		GRID SOLUTIONS		DESIGNED AND MANUFACTURED IN USA	

RATINGS NAMEPLATE NOTES:

- 1) NAMEPLATE MATERIAL: ANODIZED ALUMINUM ATTACHED WITH ALUMINUM RIVETS
- 2) NAMEPLATE LOCATION: EXTERNAL
- 3) NAMEPLATE DIMENSIONS AS SHOWN ON DRAWING 1_418_218_P1/P2
- 4) MANUFACTURE DATE AND SERIAL NUMBER ARE TO BE FILLED IN PRIOR TO ENGRAVING

REV. DESCRIPTION

ECN NO.

DRAWN BY

CHECKED

DATE

CUSTOMER: CITY OF TUPELO
CUSTOMER ORDER No.: 00002650-000
SUBSTATION: SOUTHWEST TUPELO SUBSTATION
SERIAL No.: 3797260010001

MATERIAL ID:

CCDT1-170FK-F1-001

ORDER No.

379726

NAMEPLATE - GAS SCHEMATIC

W. Holt

A. Laitsa

09/26/2022

DRAWN

CHECKED

DATE

CUSTOMER EQ. No.:



Grid Solutions
One Power Lane
Charlotte, PA 15022

DRAWING No.: E379726010

SHT 11 OF 13

A

B

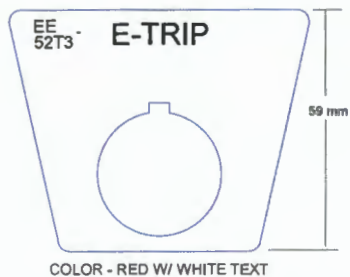
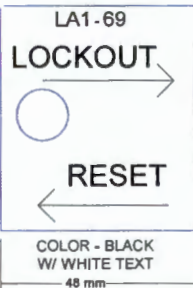
C

D

DEVICE TAGS

AT2 •	DT1 •	EA1 •	EA2 •	EDC1 •	EDC2 •	EDC3 •
	49	63GX2	63GX1	27X1	27X2	27X3
EF •	ER •	ES •	H1 •	HT1 •	L1 •	LS1 •
01CS	43L/R	52Y	100 W		7 W LED	
MA1 •	MA2 •	MA3 •	MA4 •	MB1 •	MC •	MD •
52-1	52-2	52-3	52-4	88LS	52CC	52TC1
ME •	PK1 •	PK2 •	S1 •	S2 •	S3 •	S4 •
52TC2			15A	15A	15A	15A
S5 •	S6 •	S7 •	ATD2 •	ATD1 •	EACM •	M1 •
15A	10A	20A	83X2	83X1	27X-83	88
PL1 •	H2 •	TH1 •				
GFI	100 W					

DEVICE TAG NOTES:
1) TAG MATERIAL: PLASTIC - BLACK WITH WHITE LETTERS
2) TAG DIMENSIONS AS SHOWN ON FABRICATION DRAWING 1_417_378_P1.



TERMINAL BLOCK MARKER STRIPS

TB1	TB2	TB3	TB5	TB6	TB7	TB8	TB9	TB10	TB11	TB12	TB13		TB4	TB14
1	7	13	51	63	75	87	99	111	123	135	147		32	A
2	7R	17	52	64	76	88	100	112	124	136	148		33	B
1A	8	18	53	65	77	89	101	113	125	137	149		34	C
2A	9	19	54	66	78	90	102	114	126	138	150		35	D
1B	9R	20	55	67	79	91	103	115	127	139	151		36	E
2B	9A	21	56	68	80	92	104	116	128	140	152		37	F
3	9AR	22	57	69	81	93	105	117	129	141	153			
4	10	23	58	70	82	94	106	118	130	142	154			
5	10A	24	59	71	83	95	107	119	131	143	155			
6	11	25	60	72	84	96	108	120	132	144	156			
B1	11A	26	61	73	85	97	109	121	133	145	157			
B2	B3	27	62	74	86	98	110	122	134	146	158			
P4	P4	P4	P4	P4	P4	P4	P4	P4	P4	P4	P4	P5	P5	P5

TERMINAL MARKER STRIP NOTES:
1) STRIP MATERIAL: PLASTIC - BLACK WITH WHITE LETTERS
2) STRIP DIMENSIONS AS SHOWN ON FABRICATION DRAWING 1_417_378_P... (SEE P#6 FOR EACH STRIP)

BCT TERMINAL MARKER STRIPS

1-35X	2-46X	1X	2X	3X	4X	5X	6X
A	A	1X1	2X1	3X1	4X1	5X1	6X1
B	B	1X2	2X2	3X2	4X2	5X2	6X2
C	C	1X3	2X3	3X3	4X3	5X3	6X3
-	-	1X4	2X4	3X4	4X4	5X4	6X4
-	-	1X5	2X5	3X5	4X5	5X5	6X5
N	N	GND	GND	GND	GND	GND	GND
P8	P8	P8	P8	P8	P8	P8	P8

BCT TERMINAL MARKER STRIP NOTES:
1) STRIP MATERIAL: PLASTIC - YELLOW WITH BLACK LETTERS
2) STRIP DIMENSIONS AS SHOWN ON FABRICATION DRAWING 1_417_378_P... (SEE P#6 FOR EACH STRIP)

CUSTOMER: CITY OF TUPELO
CUSTOMER ORDER No.: 00002650-000
SUBSTATION: SOUTHWEST TUPELO SUBSTATION
SERIAL No.: 3797260010001

MATERIAL ID:
CCDT1-170FK-F1-001

ORDER No.
379726

REV.	DESCRIPTION	ECN NO.	DRAWN BY	CHECKED	DATE
1	TAGS		W. Holt	A. Listaa	08/26/2022
			DRAWN	CHECKED	DATE



Grid Solutions
One Power Lane
Charleroi, PA 15022

DRAWING No.: E379726010

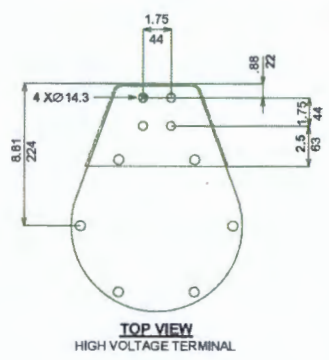
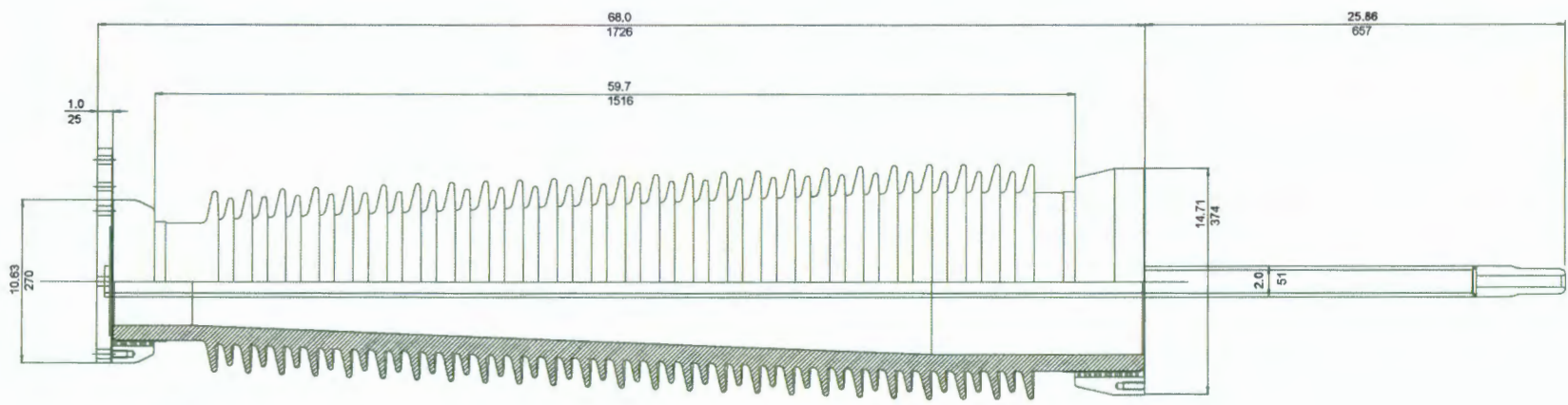
SHT 12 OF 13

A


B

C

D



BUSHING DATA
 MATERIAL: PORCELAIN
 STRIKE DISTANCE: 1516 mm / 59.69 in.
 CREEPAGE DISTANCE: 4700 mm / 185 in.
 BIL: 750 kV
 COLOR: GRAY
 HIGH VOLTAGE CONNECTION: ALUMINUM - NEMA 4 - THRU HOLE / TIN PLATED PADS

					CUSTOMER: CITY OF TUPELO CUSTOMER ORDER No.: 00002650-000 SUBSTATION: SOUTHWEST TUPELO SUBSTATION SERIAL No.: 3797260010001		MATERIAL ID: CCDT1-170FK-F1-001
					ORDER No. 379726		
REV.	DESCRIPTION	ECN NO.	DRAWN BY	CHECKED	DATE	CUSTOMER EQ. No.:	
			W. Holt	A. Laita	09/26/2022	 Grid Solutions One Power Lane Charlotte, PA 15022	
			DRAWN	CHECKED	DATE		
BUSHING OUTLINE						DRAWING No.: E379726010	SHT 13 OF 13



Grid Solutions
a GE and Alstom joint venture

CIRCUIT BREAKERS PRODUCT SOLUTIONS

DT1-145 and DT1-170

Dead tank circuit breakers
from 123 kV to 170 kV

Grid Solutions' position as global leader in circuit breaker development comes from the operating experience accumulated from more than 100,000 circuit breakers with spring-spring-operated mechanisms in service worldwide.



CUSTOMER BENEFITS

- SF₆ gas tightness guarantee
- High performance ratings
- Reliability under the most severe conditions
- Flexibility
- Virtually maintenance free
- Easy to install

With Grid Solutions, you are choosing a company that you can trust.

The DT1-145 and the DT1-170 are dead tank circuit breakers suitable for application at 170 kV and below. They are specifically designed and tested for general or definite purpose applications as well as for severe environmental conditions including low temperature, highly active seismic areas and regions with high pollution levels or corrosive atmospheres.

PERFORMANCE

The DT1-145/170 are suitable for application up to nameplate ratings, including definite purpose ratings. Extensive mechanical design testing to 10,000 operations and Class M2 certification ensure trouble-free operation for the lifetime of the circuit breaker.

GAS TIGHTNESS GUARANTEE

Grid Solutions leads the industry in SF₆ gas tightness testing technology including seals, castings and plumbing systems. Each breaker is factory tested using Grid Solutions' proprietary gas tightness testing system which provides measurable, quantifiable test results on the breaker in its fully assembled, as-shipped condition.

QUALITY

Grid Solutions designs, manufactures, tests and delivers its circuit breakers in accordance with the latest IEEE/ANSI and IEC Standards, maintaining a quality assurance system according to ISO-9001 and ISO 14001 certifications. The center of excellence for dead tank circuit breakers is located in Charleroi, PA (USA).

INSTALLATION AND MAINTENANCE

The DT1-145/170 are factory tested and adjusted and do not require any "special tools" for installation. Designed with the smallest symmetrical footprint to allow for minimised foundation costs, they are recognized worldwide as easy-to-install and operate circuit breakers. Thanks to the low energy mechanism and lifetime lubricants, the DT series is virtually maintenance free.

The DT1 series on-site installation requires only a few simple steps. For installations where truck shipment is impossible, all DT series circuit breakers can be readied for standard container shipment with only their bushings disassembled.

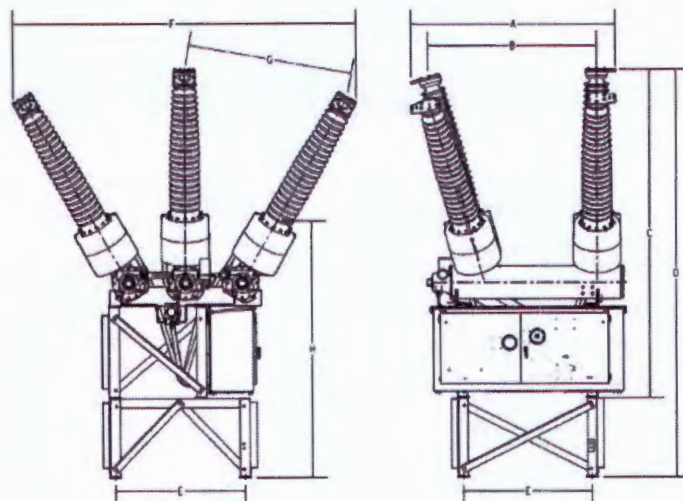


Low energy FK3-1 mechanism

TECHNICAL DATA

	Value	Units
SF ₆ pressure	93/0.64	psig/Mpa
Motor	1,600	watts
Close coil/Trip coil	440/440	watts
Ambient temperature range*	-30 to +40	degree C
High seismic capability in accordance with IEEE 693-2005		
Weight (without current transformers)	4,180/1,900	lb/kg

* Optional values available on request



DIMENSIONS

	A (in/mm)	B (in/mm)	C (in/mm)	D (in/mm)	E (in/mm)	F (in/mm)	G (in/mm)	H (in/mm)
Rated Maximum Voltage								
145 kv	90/2,284	70/1,779	136/3,459	169/4,289	54/1,372	90/2,284	69/1,747	102/2,600
170 kv	90/2,366	73/1,849	146/3,719	179/4,549	54/1,372	153/3,898	74/1,881	102/2,591

RATINGS

IEEE/ANSI	IEC	Value	Units
Rated maximum voltage	Rated voltage	123/145/170	kV
Rated power frequency	Rated frequency	50/60	Hz
Rated dielectric withstand capability	Rated insulation level		
dry withstand	at power frequency, dry	260/310/365	kV
wet withstand	at power frequency, wet	230/275/315	kV
Rated lightning impulse withstand voltage	at lightning impulse	550/650/750	kV
Rated chopped wave impulse voltage 2us		710/838/968	kV
Rated continuous current	Rated normal current	1,200/2,000/3,000	A
Rated short-circuit current	Rated short-circuit breaking current	40	kA
Rated closing, latching, and short time carrying		104	kA
Rated capacitance switching*			
	Rated single capacitor bank breaking current	400	A
Rated interrupting time		3	cycles
	Rated break time	50	ms
Rated standard operating duty	Rated operating sequence	O-0.3s-CO-15s-CO	

* Ratings available upon request.

** Please contact Grid Solutions for special purpose, high TRV, high X/R or other ratings requirements.

IPO OPTION

The DT1-145 and the DT1-170 are also available in Independent Pole Operation (IPO) configuration with separated spring/spring mechanism for each phase. Paired with a synchronous controller this can be used for point-on-wave switching of shunt capacitor or shunt reactor banks.

For more information please contact
GE Grid Solutions

Worldwide Contact Center

Web: www.GEGridSolutions.com/contact
Phone: +44 (0) 1785 250 070

www.GEGridSolutions.com





MAINTENANCE SCHEDULE

Dead Tank Circuit Breakers

GE's Grid Solutions offers a comprehensive portfolio of high voltage circuit breakers designed and tested to meet the rigorous demands of the North American power system.

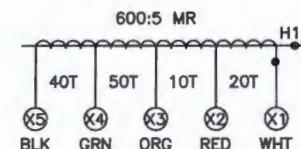
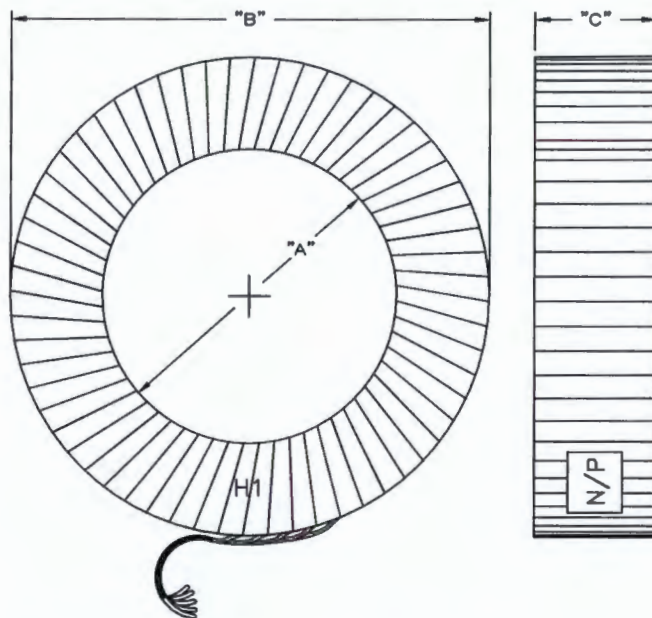
GE's SF₆ dead tank circuit breakers require very little maintenance. The decisive influencing factors that affect the condition of the circuit breaker are the years in service, the number of mechanical operations, the number of load and short-circuit current interruptions and environmental conditions.

Under normal service conditions, the GE's recommended maintenance program for type "DT" dead tank circuit breakers with FK3-x series spring/spring operating mechanisms is as follows:

- MA1: Maintenance every 15 years
- MA2: Maintenance every 30 years
- MA3: Maintenance after 10,000 Mechanical C-O Operations
- MA4: Maintenance after Electrical Wear Limit is reached

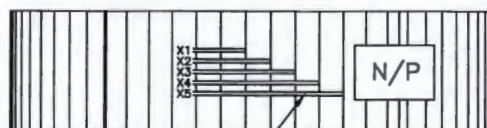
MA1 Maintenance every 15 years				
MA2 Maintenance every 30 years				
MA3 Maintenance after 10,000 cycles				
MA4 Maintenance after Electrical Wear Limit is reached				
Action				
✓	✓	✓	✓	Read and record the operating counter figures.
✓	✓	✓	✓	Check the general visual appearance of switchgear: (corrosion, paint, door gaskets, etc.).
✓	✓	✓	✓	Check SF ₆ pressure on density monitor.
✓	✓	✓	✓	Check the condition of air vents and heater operation.
✓	✓	✓	✓	Verify tightness of all external hardware with a calibrated torque wrench according to TS-00007.
✓	✓	✓	✓	Check the switch points of the SF ₆ density monitor
✓	✓	✓	✓	Check the resistance of the main current path.
✓	✓	✓	✓	Inspect the bushing insulators.
✓	✓	✓	✓	Measure the operating times of poles and auxiliary contacts, at rated voltage and pressure.
✓	✓	✓	✓	Check the SF ₆ gas quality
	✓		✓	Open for inspecting and cleaning as needed
	✓		✓	Replace desiccant (molecular sieve)
	✓			Change gas seals, reapply greases and lubricants.
	✓			Replace cabinet seals.
		✓		Replace or overhaul the operating mechanism
			✓	Check the condition of the interrupter unit.

* Increasing the inspection and maintenance frequency of circuit breakers in service is recommended under extreme service conditions and/or special applications,



NOTES:

1. INSULATION CLASS: 600 V, 10kV BIL
2. FREQUENCY 60 Hz.
3. SECONDARY LEADS ARE, AWG #10 THHN, COLOR CODED, 7 METERS (23 FT) LONG WITH TOTAL RESISTANCE OF 0.057 OHMS @ 75°C. LEADS ARE TAPED TOGETHER EVERY 914 MM (36") WITH BLACK ELECTRICAL TAPE
4. TEMPERATURE CLASS B: 130°C
5. TAPE WRAP CONSTRUCTION - 28 MM (1.12") WIDE MYLAR-INDOOR RATED
6. PHYSICAL SIZE TOLERANCE: ± 6 MM (.25")
7. CORE COVERED WITH STANDARD ITI CORE JACKET BEFORE WINDING
8. POLYESTER NAMEPLATE LOCATED IN CLOSE PROXIMITY TO LEAD TERMINATIONS



FOR MULTI-RATIO CT's ONLY.

P/N	RATIO	ACCURACY • HIGHEST RATIO		THERMAL RF • 80°C	THERMAL RATING KA 1-SEC • FULL CURRENT	THERMAL RATING KA 3-SEC • FULL CURRENT	WINDING RESISTANCE • 75°C	WINDING RESISTANCE WITH LEADS • 75°C	OHMS/TURN • 75°C	DIM. "A" MM (INCHES)	DIM. "B" MM (INCHES)	DIM. "C" MM (INCHES)	APPROX. WT KG (LBS)
		METERING	RELAYING										
CC417048-10004G	600:5MR	—	C400	4.0	113	65	0.156 Ω	0.214 Ω	0.0013 Ω	268 (10.5)	457 (18.0)	118 (4.63)	68 (150)

GE Proprietary - Class I, Public Use
Uncontrolled when printed or transmitted electronically



1907 Calumet St., Clearwater, FL 33765

REV.

MATERIAL	TOLERANCE	DRAWN	DATE	TITLE	OUTLINE - MYLAR WRAPPED BCT, DRY TYPE	ISSUE
	NOTED	JSW	9/8/16	DWG. NO.	0121B50520	
SCALE NTS	SHT 1 OF 2	CHECK	DATE			
		AB	9/8/16			



1907 Calumet St.
Clearwater, FL 33765

Typical Characteristic Curves

Part Number: CC417048-10004G

Date: 9/16/2016

Entered By: JW

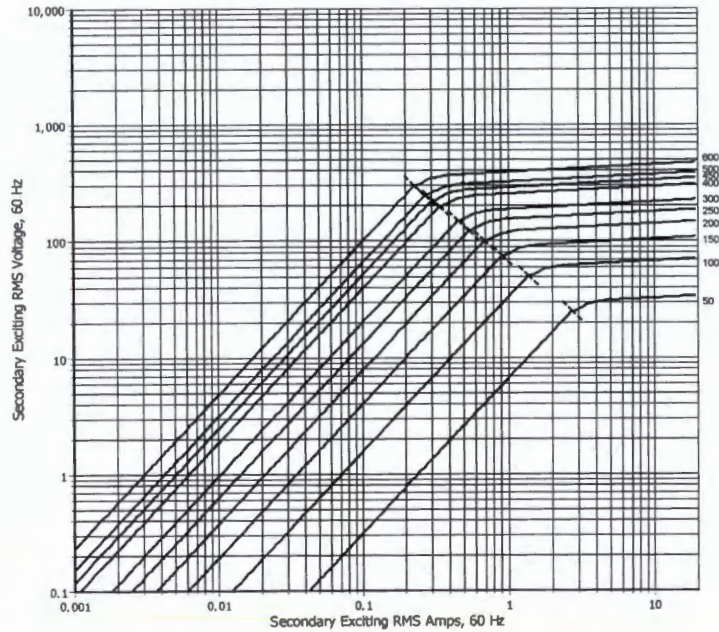
Checked By: AB

Dwg. Number: 0121B50520 P2 OF 2

Revision: SEE PAGE 1

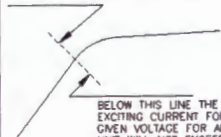
Accuracy Class: C400

TYPICAL SECONDARY EXCITATION CURVE(S)



This test report is in
accordance with
IEEE C57.13 2008

ABOVE THIS LINE THE VOLTAGE
FOR A GIVEN EXCITING CURRENT
FOR ANY UNIT WILL NOT BE LESS
THAN 95% OF THE CURVE VALUE

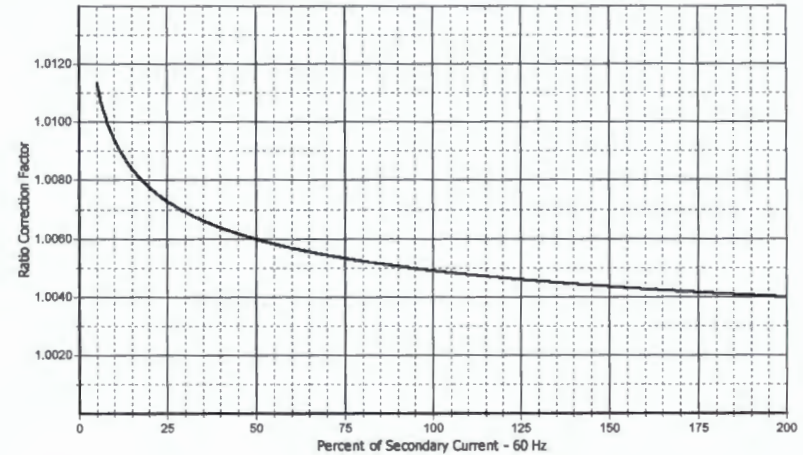


BELOW THIS LINE THE
EXCITING VOLTAGE FOR A
GIVEN VOLTAGE FOR ANY
UNIT WILL NOT EXCEED
THE CURVE VALUE BY
MORE THAN 25%

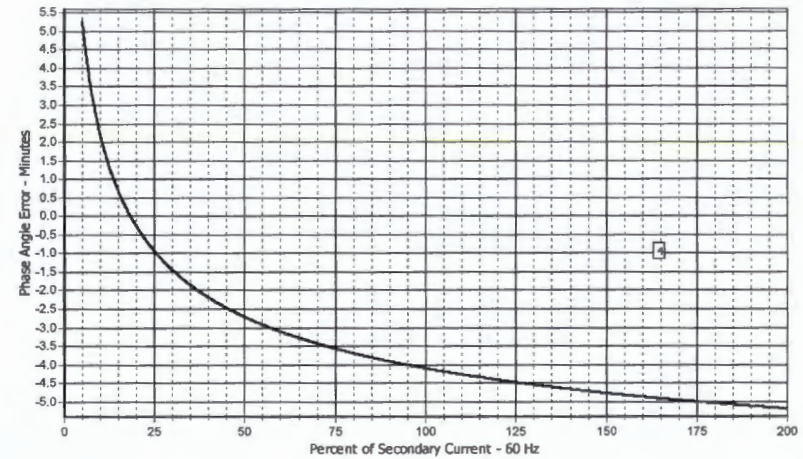
Current Ratio	Turns Ratio	Sec. Res. *
600:5	120:1	0.214
500:5	100:1	0.187
450:5	90:1	0.174
400:5	80:1	0.161
300:5	60:1	0.135
250:5	50:1	0.122
200:5	40:1	0.109
150:5	30:1	0.096
100:5	20:1	0.083
50:5	10:1	0.070

* OHMS AT 75 ° C

TYPICAL PHASE ANGLE CURVES



TYPICAL RATIO CORRECTION FACTOR CURVES



GE Proprietary - Class I, Public Use



Line Card

High Voltage Circuit Breakers

Grid Solutions offers a comprehensive portfolio of high voltage circuit breakers designed and tested to meet the rigorous demands of the North American power system

Product		Ratings	Features
DT1-38FK-40-F1		<ul style="list-style-type: none"> • Up to 38kV • 1200A to 3000A • 40kA, 3 cycles 	<ul style="list-style-type: none"> • FK3-1 SPRING/SPRING mechanism • Gang Operated
DT1-72.5FK-40-F1		<ul style="list-style-type: none"> • 72.5kV • 1200A to 3000A • 40kA, 3 cycles 	<ul style="list-style-type: none"> • FK3-1 SPRING/SPRING mechanism • Gang Operated
DT1-72.5FK-40-F3		<ul style="list-style-type: none"> • 72.5kV • 1200A to 3000A • 40kA, 3 cycles 	<ul style="list-style-type: none"> • FK3-1 SPRING/SPRING mechanisms • Independent Pole Operation (IPO) • Optional Synchronous Control for Point-on-Wave Switching
DT1-145FK-40-F1 DT1-170FK-40-F1		<ul style="list-style-type: none"> • 123kV, 145kV, 170kV • 1200A to 3000A • 40kA, 3 cycles 	<ul style="list-style-type: none"> • FK3-1 SPRING/SPRING mechanism • Gang Operated
DT1-145FK-40-F3 DT1-170FK-40-F3		<ul style="list-style-type: none"> • 123kV, 145kV, 170kV • 1200A to 3000A • 40kA, 3 cycles 	<ul style="list-style-type: none"> • FK3-1 SPRING/SPRING mechanisms • Independent Pole Operation (IPO) • Optional Synchronous Control for Point-on-Wave Switching
DT1-72.5-63-F1 DT1-145-63-F1		<ul style="list-style-type: none"> • 72.5kV, 123kV, 145kV • 1200A to 4000A • 63kA, 3 cycles 	<ul style="list-style-type: none"> • FK3-4 SPRING/SPRING mechanism • Gang Operated • NO CAPACITORS
DT1-245P-40-F1		<ul style="list-style-type: none"> • 245kV • 1200A to 4000A • 40kA, 3 cycles 	<ul style="list-style-type: none"> • FK3-4 SPRING/SPRING mechanism • Gang Operated • Optional 2 cycle performance
DT1-245P-40-F3		<ul style="list-style-type: none"> • 245kV • 1200A to 4000A • 40kA, 3 cycles 	<ul style="list-style-type: none"> • FK3-1 SPRING/SPRING mechanisms • Independent Pole Operation (IPO) • Optional Synchronous Control for Point-on-Wave Switching
DT1-245P-63-F1		<ul style="list-style-type: none"> • 245kV • 1200A to 5000A • 63kA, 2 cycles 	<ul style="list-style-type: none"> • FK3-6 SPRING/SPRING mechanism • Gang Operated • NO CAPACITORS
DT1-245P-63-F3		<ul style="list-style-type: none"> • 245kV • 1200A to 5000A • 63kA, 2 cycles 	<ul style="list-style-type: none"> • FK3-1 SPRING/SPRING mechanisms • Independent Pole Operation (IPO) • Optional Synchronous Control for Point-on-Wave Switching • NO CAPACITORS



Line Card High Voltage Circuit Breakers

Product		Ratings	Features
MOV for Shunt Reactor Switching		<ul style="list-style-type: none"> • 38kV to 800kV • Dead Tank, Live Tank, Circuit Switcher • Varistors sized based on user specifications. 	<ul style="list-style-type: none"> • Varistors across HV Terminals extend circuit breaker life • External mounting for increased reliability and ease of maintenance
DT1-362-63-F3 DT1-362R-63-F3		<ul style="list-style-type: none"> • 362kV • 1200A to 5000A • 63kA, 2 cycles 	<ul style="list-style-type: none"> • FK3-6 SPRING/SPRING mechanisms • Independent Pole Operation (IPO) • Optional Synchronous Control for Point-on-Wave Switching • Optional Pre-Insertion Resistors (PIR)
DT2-550-63-H3 DT2-550-63-F3 DT2-550R-63-H3 DT2-550R-63-F3		<ul style="list-style-type: none"> • 550kV • 1200A to 5000A • 63kA, 2 cycles 	<ul style="list-style-type: none"> • Hydraulic Mechanisms • Independent Pole Operation (IPO) • Optional Point-on-Wave Switching • Optional Pre-Insertion Resistors (PIR) • Optional SPRING/SPRING Mechanisms
GL3 Series Live Tank		<ul style="list-style-type: none"> • 72.5kV to 800kV • 1200A to 4000A • Up to 63kA, 3 cycles 	<ul style="list-style-type: none"> • FK3-x SPRING/SPRING mechanisms • Independent Pole Operation (IPO) • Or Gang Operated (voltage dependent)
Live Tank GL309 GL312 GL313 GL314		<ul style="list-style-type: none"> • 72.5kV to 245kV • 1200A to 3000A • Up to 40kA, 3 cycles 	<ul style="list-style-type: none"> • Circuit Switcher applications • FK SPRING/SPRING operated mechanism • Circuit Breaker performance in a Circuit Switcher footprint
GL314BPS High Speed Bypass Switch		<ul style="list-style-type: none"> • Up to 800kV system • Up to 170kV across gap • Making Current 120kAp • Insertion Current 5000A • Insertion Voltage 300kVp 	<ul style="list-style-type: none"> • Series Capacitor Bypass Protection • FK3-2 SPRING/SPRING mechanisms • Independent Pole Operation
HYpact		<ul style="list-style-type: none"> • 72.5 kV to 170kV • 2500A • 40kA, 3 cycles • Hybrid compact switchgear assembly 	<ul style="list-style-type: none"> • FK3-1 SPRING/SPRING mechanism • Gang Operated • Endless configurations –breakers, disconnect switches, CTs, VTs, cable connections.
CBWatch3		<ul style="list-style-type: none"> • Circuit Breaker Monitoring • IEC 61850 8.1 (DNP3 option) 	<ul style="list-style-type: none"> • Permanent real-time monitoring of CB operational parameters • SF6 emissions trending
		<ul style="list-style-type: none"> • Ratings are product and customer specific. 	<ul style="list-style-type: none"> • SF₆ Free • Global Warming Potential 98% lower than SF₆ gas
Synchronous Control (Point on Wave Switching)		<ul style="list-style-type: none"> • Cabinet mounted or Rack Mounted 	<ul style="list-style-type: none"> • Point-on-wave (POW) trip/close • Capacitors, reactors, transformers • Residual Flux compensation available

* Special ratings and applications available on request. Contact your GE representative for more information.

Terms and Conditions for Sale of Products and Services

Form EM 104 (Grid Solutions)

NOTICE: Sale of any Products or Services is expressly conditioned on Buyer's assent to these Terms and Conditions. Any acceptance of Seller's offer is expressly limited to acceptance of these Terms and Conditions and Seller expressly objects to any additional or different terms proposed by Buyer. No facility entry form shall modify these Terms and Conditions even if signed by Seller's representative. Any order to perform work and Seller's performance of work shall constitute Buyer's assent to these Terms and Conditions. Unless otherwise specified in the quotation, Seller's quotation shall expire 30 days from its date and may be modified or withdrawn by Seller before receipt of Buyer's conforming acceptance.

1. Definitions

"Buyer" means the entity to which Seller is providing Products or Services under the Contract.

"Contract" means either the contract agreement signed by both parties, or the purchase order signed by Buyer and accepted by Seller in writing, for the sale of Products or Services, together with these Terms and Conditions, Seller's final quotation, the agreed scope(s) of work, and Seller's order acknowledgement. In the event of any conflict, the Terms and Conditions shall take precedence over other documents included in the Contract.

"Contract Price" means the agreed price stated in the Contract for the sale of Products and Services, including adjustments (if any) in accordance with the Contract.

"Firmware" means software provided with or embedded in a Product and necessary for the proper functioning of the Product, but excluding software supplied by a third party and software applications licensed separately

"Hazardous Materials" means any toxic or hazardous substance, hazardous material, dangerous or hazardous waste, dangerous good, radioactive material, petroleum or petroleum-derived products or by-products, or any other chemical, substance, material or emission, that is regulated, listed or controlled pursuant to any national, state, provincial, or local law, statute, ordinance, directive, regulation or other legal requirement of the United States ("U.S.") or the country of the Site.

"Insolvent/Bankrupt" means that a party is insolvent, makes an assignment for the benefit of its creditors, has a receiver or trustee appointed for it or any of its assets, or files or has filed against it a proceeding under any bankruptcy, insolvency dissolution or liquidation laws.

"Products" means the equipment, parts, materials, supplies, software, and other goods Seller has agreed to supply to Buyer under the Contract.

"Seller" means the entity providing Products or performing Services under the Contract.

"Services" means the services Seller has agreed to perform for Buyer under the Contract.

"Site" means the premises where Products are used or Services are performed, not including Seller's premises from which it performs Services.

"Terms and Conditions" means these "Terms and Conditions for Sale of Products and Services", including any relevant addenda pursuant to Article 18, together with any modifications or additional provisions specifically stated in Seller's final quotation or specifically agreed upon by Seller in writing.

2. Payment

2.1 Buyer shall pay Seller for the Products and Services by paying all invoiced amounts by direct bank transfer in the currency specified by Seller in the Contract, without set-off for any payment from Seller not due under this Contract, within thirty (30) days from the invoice date. Remittance advice notifying of payment is to be sent to Remit.Renewable.Energy@ge.com. Invoicing and payment shall be in accordance with the Contract. If not otherwise agreed in the Contract, Seller shall issue invoices upon shipment of Products and as Services are performed, or if the Contract Price is U.S. Two Hundred Fifty Thousand Dollars (\$250,000) or more, progress payments shall be invoiced starting with twenty-five percent (25%) of the Contract Price for Products and Services upon the earlier of Contract signature or issuance of Seller's order acknowledgement and continuing such that ninety percent (90%) of the Contract Price for Products is re-

ceived before the earliest scheduled Product shipment and Services are invoiced as performed ("the Progress Payments"). For each calendar month, or fraction thereof, that payment is late, Buyer shall pay a late payment charge computed at the rate of 1.5% per month on the overdue balance, or the maximum rate permitted by law, whichever is less. If the price is set by the Contract in a currency other than U.S. dollars, references to U.S. dollars in this Section 2.1 shall mean the equivalent amount in the applicable currency. In case of any increase in material or labor costs over the Contract execution period the Seller shall be entitled to get compensated as per the Contract price escalation mechanism specified in the Seller's offer. In case the Contract does not comprise a price escalation mechanism and if a Party can demonstrate that the continued performance of its contractual obligations has become excessively onerous due to an event as per Clause 10 (which will include evolution of any event preexisting at the time of signature of the Contract), the Parties are bound, within a reasonable time of written notice by one Party to the other, to negotiate alternative contractual terms or a mitigation plan which reasonably permit the consequences of the event to be mitigated or the restoration of the balance that was pre-existing at the signature of the Contract between the Parties. The Party serving notice under this Clause shall provide the other Party with as much commercially available details of the event or events affecting that Party's contractual obligations, the affected obligations themselves and how and to which extent these events are (and will be) affecting the performance of the Contract. The Parties shall act in the spirit of openness and transparency in this communication within the limits set by applicable antitrust laws and regulations. Where an agreement is reached, the Parties shall start implementing the agreed measures immediately, pending the signature of the relevant amendment to the Contract. In the event the Parties are unable to agree on alternative contractual terms or on a mitigation plan as provided above within fifteen (15) days of the written notice, and in the absence of any other agreement, the Party serving notice under this Clause will be entitled to either suspend its performance of the affected portion of the Contract, or to terminate the Contract, without any liability to the other party. If the Contract is suspended for a period greater than 60 consecutive days by that Party, either Party may terminate the Contract by sending written notice of termination to the other Party. In case of termination of the Contract hereunder, the Parties shall settle their accounts accordingly as if the Contract had been terminated through no fault of the Parties, without prejudice to any Party's right to apply the provisions of Clause 16.2 hereof. To support the prevention of fraud, in the event the Buyer is required to make a payment to a bank account that is not the one expressly agreed in the Contract, the Buyer shall before proceeding with payment request confirmation to the Seller that the bank account identified in the invoice or request for payment is valid. Verification must be anticipated not to lead to any delay in making payment.

2.2 As and if requested by Seller, Buyer shall at its expense establish and keep in force payment security in the form of an irrevocable, unconditional, sight letter of credit or bank guarantee allowing for pro-rata payments as Products are shipped and Services are performed, plus payment of cancellation and termination charges, and all other amounts due from Buyer under the Contract ("Payment Security"). The Payment Security shall be (a) in a form, and issued or confirmed by a bank acceptable to Seller, (b) payable at the counters of such acceptable bank or negotiating bank, (c) opened prior to commencement of work by Seller with respect to development, manufacturing and shipment of Products and at least sixty (60) days prior to commencement of Services, and (d) remain in effect until the latest of ninety (90) days after the last scheduled Product shipment, completion of all Services and Seller's receipt of the final payment required under the Contract. Buyer shall, at its expense, increase the amount(s), extend the validity period(s) and make other appropriate modifications to any Payment Security within ten (10) days of Seller's notification that such adjustment is necessary in connection with Buyer's obligations under the Contract.

2.3 Seller is not required to commence or continue its performance unless and until any required Payment Security is received, operative and in effect and all applicable Progress Payments have been received. For each day of delay in receiving Progress Payments or acceptable Payment Security, Seller shall be entitled to an equitable extension of the schedule. If at any time Seller reasonably determines that Buyer's financial condition or payment history does not justify continuation of Seller's performance, Seller shall be entitled to require full or partial payment in advance or otherwise restructure payments, request additional forms of Payment Security, suspend its performance or terminate the Contract.

3. Taxes and Duties

Seller shall be responsible for all corporate taxes measured by net income due to performance of or payment for work under this Contract ("Seller Taxes"). Buyer shall be responsible for all taxes, duties, fees, or other charges of any nature (including, but not limited to, consumption, gross receipts, import, property, sales, stamp, turnover, use, or value-added taxes, and all items of withholding, deficiency, penalty, addition to tax, interest, or assessment related thereto, imposed by any governmental authority on Buyer or Seller or its subcontractors) in relation to the Contract or the performance of or payment for work under the Contract other than Seller Taxes ("Buyer Taxes"). The Contract Price does not include the amount of any Buyer Taxes. If Buyer deducts or withholds Buyer Taxes, Buyer shall pay additional amounts so that Seller receives the full Contract Price without reduction for Buyer Taxes. Buyer shall provide to Seller, within one month of payment, official receipts from the applicable governmental authority for deducted or withheld taxes.

4. Deliveries; Title Transfer; Risk of Loss; Storage

4.1 For shipments that do not involve export, including shipments from one European Union ("EU") country to another EU country, Seller shall deliver Products to Buyer FCA Seller's facility or warehouse (Incoterms 2020). For export shipments, Seller shall deliver Products to Buyer FCA Port of Export (Incoterms 2020). Notwithstanding anything to the contrary, for any importation, Buyer shall be identified as the importer in all applicable documents. Buyer shall pay all delivery costs and charges or pay Seller's standard shipping charges plus

up to twenty-five (25%) percent. Partial deliveries are permitted. Seller may deliver Products in advance of the delivery schedule. In case Buyer and Seller agree on different transportation arrangement with cost of freight and delivery to destination included in the Contract Price, Seller will not be responsible for any increase in transportation costs occurring after the Contract signature unless if caused by Seller's sole negligence, and Seller will be entitled to invoice the Buyer the additional transportation costs it has actually incurred, subject to reasonable justification of such additional costs. Delivery times are approximate and are dependent upon prompt receipt by Seller of all information necessary to proceed with the work without interruption. If Products delivered do not correspond in quantity, type or price to those itemized in the shipping invoice or documentation, Buyer shall so notify Seller within ten (10) days after receipt.

4.2 For shipments that do not involve export, title to Products shall pass to Buyer upon delivery in accordance with Section 4.1. For export shipments from a Seller facility or warehouse outside the U.S., title shall pass to Buyer upon delivery in accordance with Section 4.1. For shipments from the U.S. to another country, title shall pass to Buyer immediately after each item departs from the territorial land, seas and overlying airspace of the U.S. The 1982 United Nations Convention of the law of the Sea shall apply to determine the U.S. territorial seas. For all other shipments, title to Products shall pass to Buyer the earlier of (i) the port of export immediately after Products have been cleared for export or (ii) immediately after each item departs from the territorial land, seas and overlying airspace of the sending country. When Buyer arranges the export or intercommunity shipment, Buyer will provide Seller evidence of exportation or intercommunity shipment acceptable to the relevant tax and custom authorities.

4.3 Risk of loss shall pass to Buyer upon delivery pursuant to Section 4.1, except that for export shipments from the U.S., risk of loss shall transfer to Buyer upon title passage.

4.4 If any Products to be delivered under this Contract or if any Buyer equipment repaired at Seller's facilities cannot be shipped to or received by Buyer or end user when ready due to any cause attributable to Buyer, its other contractors or the end user, Seller may ship the Products and equipment to a storage facility, including storage at the place of manufacture or repair, or to an agreed freight forwarder. If Seller places Products or equipment into storage, the following apply: (i) title and risk of loss immediately pass to Buyer, if they have not already passed, and delivery shall be deemed to have occurred; (ii) any amounts otherwise payable to Seller upon delivery or shipment shall be due; (iii) Seller will be entitled to invoice the Buyer the costs of transportation to the storage facilities plus a lumpsum amount of 0.5% of the Contract Price per full week (or prorata thereof) of storage with a minimum of USD 1000 (one thousand United States Dollars). Invoices shall be on a weekly basis starting the beginning of third week of storage until the shipment of the Products can be made; and (iv) when conditions permit and upon payment of all amounts due, Seller shall make Products and repaired equipment available to Buyer for delivery. If the Contract requires Seller to submit drawings or other documents for approval by Buyer, Buyer shall review and issue its response (either approval or disapproval with reasons for disapproval detailed) within 10 days of Seller's submittal. If Buyer fails to provide a response within 10 days, the submittal shall be deemed approved.

4.5 If repair Services are to be performed on Buyer's equipment at Seller's facility, Buyer shall be responsible for, and shall retain risk of loss of, such equipment at all times, except that Seller shall be responsible for damage to the equipment while at Seller's facility to the extent such damage is caused by Seller's negligence.

5. Warranty

5.1 Seller warrants that Products shall be delivered free from defects in material, workmanship and title and that Services shall be performed in a competent, diligent manner in accordance with any mutually agreed specifications.

5.2 The warranty for Products shall expire one (1) year from first use or eighteen (18) months from delivery, whichever occurs first, except that software is warranted for ninety (90) days from delivery. The warranty for Services shall expire one (1) year after performance of the Service, except that software-related Services are warranted for ninety (90) days.

5.3 If Products or Services do not meet the above warranties, Buyer shall promptly notify Seller in writing prior to expiration of the warranty period. Seller shall (i) at its option, repair or replace defective Products and (ii) re-perform defective Services. If despite Seller's reasonable efforts, a non-conforming Product cannot be repaired or replaced, or non-conforming Services cannot be re-performed, Seller shall refund or credit monies paid by Buyer for such non-conforming Products and Services. Warranty repair, replacement or re-performance by Seller shall not extend or renew the applicable warranty period. Buyer shall obtain Seller's agreement on the specifications of any tests it plans to conduct to determine whether a non-conformance exists.

5.4 Buyer shall bear the costs of access for Seller's remedial warranty efforts (including removal and replacement of systems, structures or other parts of Buyer's facility), de-installation, decontamination, re-installation and transportation of defective Products to Seller and back to Buyer.

5.5 The warranties and remedies are conditioned upon (a) proper storage, installation (by properly certified installers or under the supervision of properly certified supervisors, if required), use, operation, and maintenance of Products, (b) Buyer keeping accurate and complete records of operation and maintenance during the warranty period and providing Seller access to those records, and (c) modifi-

cation or repair of Products or Services only as authorized by Seller in writing. Failure to meet any such conditions renders the warranty null and void. Seller is not responsible for normal wear and tear.

5.6 This Article 5 provides the exclusive remedies for all claims based on failure of or defect in Products or Services, regardless of when the failure or defect arises, and whether a claim, however described, is based on contract, warranty, indemnity, tort/extra-contractual liability (including negligence), strict liability or otherwise. The warranties provided in this Article 5 are exclusive and are in lieu of all other warranties, conditions and guarantees whether written, oral, implied or statutory. NO IMPLIED OR STATUTORY WARRANTY, OR WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE APPLIES.

6. Confidentiality

6.1 Seller and Buyer (as to information disclosed, the "Disclosing Party") may each provide the other party (as to information received, the "Receiving Party") with Confidential Information in connection with this Contract. "Confidential Information" means (a) information that is designated in writing as "confidential" or "proprietary" by Disclosing Party at the time of written disclosure, and (b) information that is orally designated as "confidential" or "proprietary" by Disclosing Party at the time of oral or visual disclosure and is confirmed to be "confidential" or "proprietary" in writing within twenty (20) days after the oral or visual disclosure. In addition, prices for Products and Services shall be considered Seller's Confidential Information.

6.2 Receiving Party agrees: (i) to use the Confidential Information only in connection with the Contract and use of Products and Services, (ii) to take reasonable measures to prevent disclosure of the Confidential Information to third parties, and (iii) not to disclose the Confidential Information to a competitor of Disclosing Party. Notwithstanding these restrictions, (a) Seller may disclose Confidential Information to its affiliates and subcontractors in connection with performance of the Contract, (b) a Receiving Party may disclose Confidential Information to its auditors, (c) Buyer may disclose Confidential Information to lenders as necessary for Buyer to secure or retain financing needed to perform its obligations under the Contract, and (d) a Receiving Party may disclose Confidential Information to any other third party with the prior written permission of Disclosing Party, and in each case, only so long as the Receiving Party obtains a non-disclosure commitment from any such subcontractors, auditors, lenders or other permitted third party that prohibits disclosure of the Confidential Information and provided further that the Receiving Party remains responsible for any unauthorized use or disclosure of the Confidential Information. Receiving Party shall upon request return to Disclosing Party or destroy all copies of Confidential Information except to the extent that a specific provision of the Contract entitles Receiving Party to retain an item of Confidential Information. Seller may also retain one archive copy of Buyer's Confidential Information.

6.3 The obligations under this Article 6 shall not apply to any portion of the Confidential Information that: (i) is or becomes generally available to the public other than as a result of disclosure by Receiving Party, its representatives or its affiliates; (ii) is or becomes available to Receiving Party on a non-confidential basis from a source other than Disclosing Party when the source is not, to the best of Receiving Party's knowledge, subject to a confidentiality obligation to Disclosing Party; (iii) is independently developed by Receiving Party, its representatives or affiliates, without reference to the Confidential Information; (iv) is required to be disclosed by law or valid legal process provided that the Receiving Party intending to make disclosure in response to such requirements or process shall promptly notify the Disclosing Party in advance of such disclosure and reasonably cooperate in attempts to maintain the confidentiality of the Confidential Information.

6.4 Each Disclosing Party warrants that it has the right to disclose the information that it discloses. Neither Buyer nor Seller shall make any public announcement about the Contract without prior written approval of the other party. As to any individual item of Confidential Information, the restrictions under this Article 6 shall expire five (5) years after the date of disclosure. Article 6 does not supersede any separate confidentiality or nondisclosure agreement signed by the parties.

7. Intellectual Property

7.1 Notwithstanding the provisions of section 4.2, Seller grants only a non-exclusive license, and does not pass title, to any Firmware and other software provided by Seller under this Contract, drawings and other documentation delivered for use of Buyer shall remain subject to ownership and/or intellectual property rights of Seller, as applicable and title to any leased equipment remains with Seller.

7.2 Seller shall defend and indemnify Buyer against any claim by a non-affiliated third party (a "Claim") alleging that Products or Services furnished under this Contract infringe a patent in effect in the U.S., an EU member state or the country of the Site (provided there is a corresponding patent issued by the U.S. or an EU member state), or any copyright or trademark registered in the country of the Site, provided that Buyer (a) promptly notifies Seller in writing of the Claim, (b) makes no admission of liability and does not take any position adverse to Seller, (c) gives Seller sole authority to control defense and settlement of the Claim, and (d) provides Seller with full disclosure and reasonable assistance as required to defend the Claim.

7.3 Section 7.2 shall not apply and Seller shall have no obligation or liability with respect to any Claim based upon (a) Products or Services that have been modified, or revised, (b) the combination of any Products or Services with other products or services when such

combination is a basis of the alleged infringement, (c) failure of Buyer to implement any update provided by Seller that would have prevented the Claim, (d) unauthorized use of Products or Services, or (e) Products or Services made or performed to Buyer's specifications.

7.4 Should any Product or Service, or any portion thereof, become the subject of a Claim, Seller may at its option (a) procure for Buyer the right to continue using the Product or Service, or applicable portion thereof, (b) modify or replace it in whole or in part to make it non-infringing, or (c) failing (a) or (b), take back infringing Products or Services and refund the price received by Seller attributable to the infringing Products or Services.

7.5 Article 7 states Seller's exclusive liability for intellectual property infringement by Products and Services.

7.6 Each party shall retain ownership of all Confidential Information and intellectual property it had prior to the Contract. All rights in and to Firmware and software not expressly granted to Buyer are reserved by Seller. All new intellectual property conceived or created by Seller in the performance of this Contract, whether alone or with any contribution from Buyer, shall be owned exclusively by Seller. Buyer agrees to deliver assignment documentation as necessary to achieve that result.

8. Indemnity

Each of Buyer and Seller (as an "Indemnifying Party") shall indemnify the other party (as an "Indemnified Party") from and against claims brought by a third party, on account of personal injury or damage to the third party's tangible property, to the extent caused by the negligence of the Indemnifying Party in connection with this Contract. In the event the injury or damage is caused by joint or concurrent negligence of Buyer and Seller, the loss or expense shall be borne by each party in proportion to its degree of negligence. For purposes of Seller's indemnity obligation, no part of the Products or Site is considered third party property.

9. Insurance

During the term of the Contract, Seller shall maintain for its protection the following insurance coverage: (i) Worker's Compensation, Employer's Liability and other statutory insurance required by law with respect to work related injuries or disease of employees of Seller in such form(s) and amount(s) as required by applicable laws; (ii) Automobile Liability insurance with a combined single limit of \$2,500,000.00; and (iii) Commercial General Liability or Public Liability insurance for bodily injury and property damage with a combined single limit of \$2,500,000.00. If required in the Contract, Seller shall provide a certificate of insurance reflecting such coverage.

10. Excusable Events

Seller shall not be liable or considered in breach of its obligations under this Contract to the extent that Seller's performance is delayed or prevented, directly or indirectly, by any cause beyond its reasonable control, or by armed conflict, acts or threats of terrorism, epidemics, pandemics, strikes or other labor disturbances, or acts or omissions of any governmental authority or of the Buyer or Buyer's contractors or suppliers. If an excusable event occurs, the schedule for Seller's performance shall be extended by the amount of time lost by reason of the event plus such additional time as may be needed to overcome the effect of the event. If acts or omissions of the Buyer or its contractors or suppliers cause the delay, Seller shall also be entitled to an equitable price adjustment.

Buyer recognizes that in case of epidemics or pandemics (or evolution of existing epidemics or pandemics), the precautionary, mitigation or corrective measures implemented by the Seller in the frame of the Contract are implemented in the best interest of the Buyer and the Contract performance, and the Buyer and Seller both agree that the additional costs reasonably incurred by Seller in implementing such measures shall be compensated by the Buyer to the Seller.

11. Termination and Suspension

11.1 Buyer may terminate the Contract (or the portion affected) for cause if Seller (i) becomes Insolvent/Bankrupt, or (ii) commits a material breach of the Contract which does not otherwise have a specified contractual remedy, provided that: (a) Buyer shall first provide Seller with detailed written notice of the breach and of Buyer's intention to terminate the Contract, and (b) Seller shall have failed, within 30 days after receipt of the notice, to commence and diligently pursue cure of the breach.

11.2 If Buyer terminates the Contract pursuant to Section 11.1, (i) Seller shall reimburse Buyer the difference between that portion of the Contract Price allocable to the terminated scope and the actual amounts reasonably incurred by Buyer to complete that scope, and (ii) Buyer shall pay to Seller (a) the portion of the Contract Price allocable to Products completed, (b) lease fees incurred, and (c) amounts for Services performed before the effective date of termination. The amount due for Services shall be determined in accordance with the milestone schedule (for completed milestones) and rates set forth in the Contract (for work toward milestones not yet achieved and where there is no milestone schedule), as applicable or, where there are no milestones and/or rates in the Contract, at Seller's then-current standard time and material rates.

11.3 Seller may suspend or terminate the Contract (or any affected portion thereof) immediately for cause if Buyer (i) becomes Insolvent/Bankrupt, or (ii) materially breaches the Contract, including, but not limited to, failure or delay in Buyer providing Payment Security, making any payment when due, or fulfilling any payment conditions.

11.4 If the Contract (or any portion thereof) is terminated for any reason other than Seller's default under Section 11.1, Buyer shall pay Seller for all Products completed, lease fees incurred and Services performed before the effective date of termination, plus expenses reasonably incurred by Seller in connection with the termination. The amount due for Services shall be determined in accordance with the milestone schedule (for completed milestones) and rates set forth in the Contract (for work toward milestones not yet achieved and where there is no milestone schedule), as applicable or, where there are no milestones and/or rates in the Contract, at Seller's then-current standard time and material rates. In addition, Buyer shall pay Seller a cancellation charge equal to 80% of the Contract Price applicable to uncompleted made-to-order Products and 15% of the Contract Price applicable to all other uncompleted Products or Services.

11.5 Either Buyer or Seller may terminate the Contract (or the portion affected) upon twenty (20) days advance notice if there is an excusable event (as described in Article 10) lasting longer than ninety (90) days or such other period agreed upon in writing. In such case, Buyer shall pay to Seller amounts payable under Section 11.4, provided that Buyer's payments shall include the cancellation charge for uncompleted Products if the excusable event(s) leading to the termination included an act or omission of the Buyer or Buyer's contractors or suppliers but Buyer shall not be required to pay the cancellation charge if the excusable event(s) leading to termination did not include any act or omission of the Buyer or Buyer's contractors or suppliers.

11.6 Buyer shall pay all reasonable expenses incurred by Seller in connection with a suspension, including, but not limited to, expenses for repossession, fee collection, demobilization/remobilization, and costs of storage during suspension. The schedule for Seller's obligations shall be extended for a period of time reasonably necessary to overcome the effects of any suspension.

12. Compliance with Laws and Regulations

12.1 Seller shall comply with laws applicable to the manufacture of Products and its performance of Services. Buyer shall comply with laws applicable to the purchase, application, operation, use and disposal of the Products and Services, including without limitation those regarding anticorruption/antibribery, fair competition (antitrust), and environment, health and safety (EHS). Buyer acknowledges it had access, reviewed, and fully understands GE's Integrity Policies. Seller shall at all times comply with the GE Integrity Policies. The GE Integrity Policies can be accessed electronically at https://www.ge.com/sites/default/files/S&L_Booklet_English_0.pdf

12.2 Seller's obligations are conditioned upon Buyer's compliance with all US, EU, UK and other applicable trade control laws and regulations. Buyer shall not trans-ship, re-export, divert or direct or otherwise make or allow any disposition of equipment, materials, services, technology, technical data, software, or other information or assistance or Product furnished by the Seller under the Contract other than in and to the ultimate country of destination declared by Buyer and specified as the country of ultimate destination on Seller's invoice. The Buyer hereby certifies that the equipment, materials, services, technology, technical data, software, or other information or assistance or product furnished by the Seller under the Contract will not be used in the design, development, production, stockpiling or use of chemical, biological, or nuclear weapons. The Buyer shall also ensure that the bank or financial institution or other entity executing any payments or financial transactions under the Contract on behalf of the Buyer (including without limitation the issuance of any payment securities such as a letter of credit) is not subject to any export regulation prohibiting to do business with such bank, financial institution or entity. Should the Buyer fail to comply with any of the obligations as specified above, the Seller may, without prejudice to the exercise of any other rights or remedies which may be available to it, terminate the Contract by giving the Buyer notice in writing to that effect. In the event of a change in applicable trade control laws and regulations, including but not limited to the laws of the US, EU and UK and changes in the interpretation thereof, or in the event an authorization pursuant to said laws is either denied, revoked, withdrawn or cancelled at any time, preventing the Seller from executing its obligations without breaching such applicable trade control laws and regulations or makes Seller's execution of its obligations unreasonably burdensome or unbalanced, Seller shall have the right without incurring liability to the Buyer to (i) withdraw its proposal, or either (ii) suspend its performance of the Contract or terminate the Contract. If the suspension lasts more than four (4) months, any of the Parties shall have the right to terminate the Contract by giving the other Party notice in writing to that effect.

12.3 Notwithstanding any other provision, Buyer shall timely obtain, effectuate and maintain in force any required permit, license, exemption, filing, registration and other authorization, including, but not limited to, building and environmental permits, import licenses, environmental impact assessments, and foreign exchange authorizations, required for the lawful performance of Services at the Site or fulfillment of Buyer's obligations, except that Seller shall obtain any license or registration necessary for Seller to generally conduct business and visas or work permits, if any, necessary for Seller's personnel. Buyer shall provide reasonable assistance to Seller in obtaining such visas and work permits.

13. Environmental, Health and Safety Matters

13.1 Buyer shall maintain safe working conditions at the Site, including, without limitation, implementing appropriate procedures regarding Hazardous Materials, confined space entry, and energization and de-energization of power systems (electrical, mechanical and hydraulic) using safe and effective lock-out/tag-out ("LOTO") procedures including physical LOTO or a mutually agreed upon alternative method.

13.2 Buyer shall timely advise Seller in writing of all applicable Site-specific health, safety, security and environmental requirements and procedures. Without limiting Buyer's responsibilities under Article 13, Seller has the right but not the obligation to, from time to time, review and inspect applicable health, safety, security and environmental documentation, procedures and conditions at the Site.

13.3 If, in Seller's reasonable opinion, the health, safety, or security of personnel or the Site is, or is apt to be, imperiled by security risks, terrorist acts or threats, the presence of or threat of exposure to Hazardous Materials, or unsafe working conditions, Seller may, in addition to other rights or remedies available to it, evacuate some or all of its personnel from Site, suspend performance of all or any part of the Contract, and/or remotely perform or supervise work. Any such occurrence shall be considered an excusable event. Buyer shall reasonably assist in any such evacuation.

13.4 Operation of Buyer's equipment is the responsibility of Buyer. Buyer shall not require or permit Seller's personnel to operate Buyer's equipment at Site.

13.5 Buyer will make its Site medical facilities and resources available to Seller personnel who need medical attention.

13.6. Seller has no responsibility or liability for the pre-existing condition of Buyer's equipment or the Site. Prior to Seller starting any work at Site, Buyer will provide documentation that identifies the presence and condition of any Hazardous Materials existing in or about Buyer's equipment or the Site that Seller may encounter while performing under this Contract. Buyer shall disclose to Seller industrial hygiene and environmental monitoring data regarding conditions that may affect Seller's work or personnel at the Site. Buyer shall keep Seller informed of changes in any such conditions.

13.7 Seller shall notify Buyer if Seller becomes aware of: (i) conditions at the Site differing materially from those disclosed by Buyer, or (ii) previously unknown physical conditions at Site differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract. If any such conditions cause an increase in Seller's cost of, or the time required for, performance of any part of the work under the Contract, an equitable adjustment in price and schedule shall be made.

13.8 If Seller encounters Hazardous Materials in Buyer's equipment or at the Site that require special handling or disposal, Seller is not obligated to continue work affected by the hazardous conditions. In such an event, Buyer shall eliminate the hazardous conditions in accordance with applicable laws and regulations so that Seller's work under the Contract may safely proceed, and Seller shall be entitled to an equitable adjustment of the price and schedule to compensate for any increase in Seller's cost of, or time required for, performance of any part of the work. Buyer shall properly store, transport and dispose of all Hazardous Materials introduced, produced or generated in the course of Seller's work at the Site.

13.9 Buyer shall indemnify Seller for any and all claims, damages, losses, and expenses arising out of or relating to any Hazardous Materials which are or were (i) present in or about Buyer's equipment or the Site prior to the commencement of Seller's work, (ii) improperly handled or disposed of by Buyer or Buyer's employees, agents, contractors or subcontractors, or (iii) brought, generated, produced or released on Site by parties other than Seller.

14. Changes

14.1 Each party may at any time propose changes in the schedule or scope of Products or Services. Seller is not obligated to proceed with any change until both parties agree upon such change in writing. The written change documentation will describe the changes in scope and schedule, and the resulting changes in price and other provisions, as agreed.

14.2 The scope, Contract Price, schedule, and other provisions will be equitably adjusted to reflect additional costs or obligations incurred by Seller resulting from a change, after Seller's proposal date, in Buyer's Site-specific requirements or procedures, or in industry specifications, codes, standards, applicable laws or regulations. However, no adjustment will be made on account of a general change in Seller's manufacturing or repair facilities resulting from a change in laws or regulations applicable to such facilities. Unless otherwise agreed by the parties, pricing for additional work arising from such changes shall be at Seller's time and material rates.

14.3 It shall be acceptable and not considered a change if Seller delivers a Product that bears a different, superseding or new part or version number compared to the part or version number listed in the Contract.

15. Limitations of Liability

15.1 The total liability of Seller for all claims of any kind arising from or related to the formation, performance or breach of this Contract, or any Products or Services, shall not exceed the (i) Contract Price, or (ii) if Buyer places multiple order(s) under the Contract, the price of each particular order for all claims arising from or related to that order and ten thousand US dollars (US \$10,000) for all claims not part of any particular order.

15.2 Seller shall not be liable for loss of profit or revenues, loss of use of equipment or systems, interruption of business, cost of replacement power, cost of capital, downtime costs, increased operating costs, any special, consequential, incidental, indirect, or punitive damages, or claims of Buyer's customers for any of the foregoing types of damages.

15.3 All Seller liability shall end upon expiration of the applicable warranty period, provided that Buyer may continue to enforce a claim for which it has given notice prior to that date by commencing an action or arbitration, as applicable under this Contract, before expiration of any statute of limitations or other legal time limitation but in no event later than one year after expiration of such warranty period.

15.4 Seller shall not be liable for advice or assistance that is not required for the work scope under this Contract.

15.5 If Buyer is supplying Products or Services to a third party, or using Products or Services at a facility owned by a third party, Buyer shall either (i) indemnify and defend Seller from and against any and all claims by, and liability to, any such third party in excess of the limitations set forth in this Article 15, or (ii) require that the third party agree, for the benefit of and enforceable by Seller, to be bound by all the limitations included in this Article 15.

15.6 For purposes of this Article 15, the term "Seller" means Seller, its affiliates, subcontractors and suppliers of any tier, and their respective employees. The limitations in this Article 15 shall apply regardless of whether a claim is based in contract, warranty, indemnity, tort/extra-contractual liability (including negligence), strict liability or otherwise, and shall prevail over any conflicting terms, except to the extent that such terms further restrict Seller's liability.

16. Governing Law and Dispute Resolution

16.1 This Contract shall be governed by and construed in accordance with the laws of (i) the State of New York if Buyer's place of business is in the U.S. or (ii) England and Wales if the Buyer's place of business is outside the U.S., in either case without giving effect to any choice of law rules that would cause the application of laws of any other jurisdiction (the "Governing Law"). If the Contract includes the sale of Products and the Buyer is outside the Seller's country, the United Nations Convention on Contracts for the International Sale of Goods shall apply.

16.2 In the event of any dispute arising out of or in connection with this Contract, including any question regarding its existence or validity, the parties agree to submit the matter to mediation under the ICC mediation Rules, without prejudice to either party's right to seek emergency, interim or conservatory measures of protection at any time.

If the dispute has not been settled pursuant to the ICC Mediation Rules within thirty (30) days following the filing of a request for Mediation or within such other period as the parties may agree in writing, such dispute shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with the said Rules of Arbitration. In case the arbitral tribunal is constituted of more than one arbitrator, the party-appointed arbitrators shall, for a period of two (2) weeks following the date on which their appointments have both been confirmed, attempt to reach agreement on the president of the arbitral tribunal. For this purpose, the arbitrators may communicate with the parties on an *ex-parte* basis.

If the two arbitrators are unable to agree upon the third, upon request of either Buyer or Seller, the President of the ICC shall appoint the third.

The seat, or legal place, of the mediation and arbitration shall be Geneva, Switzerland.

The language to be used in the mediation and in the arbitration shall be the English language.

The parties' written submissions shall, to the extent possible, contain all arguments and supporting materials on fact, law and damages, including all exhibits on which each party intends to rely, supporting witness statements, expert reports and legal authorities.

17. Inspection and Factory Tests

Seller will apply its normal quality control procedures in manufacturing Products and perform any factory tests in accordance with Seller's standard procedures. Seller shall attempt to accommodate requests by Buyer to witness Seller's factory tests of Products, subject to appropriate access restrictions, if such witnessing can be arranged without delaying the work. Travel and living expenses of Buyer personnel to witness such tests shall be borne by Buyer. Unless otherwise agreed, failure by the Buyer or its representative to attend the factory tests on the scheduled date shall entitle the Seller to proceed with such factory tests alone and the Seller shall promptly share the results of such tests with the Buyer. In the event the factory tests or any other tests to be performed under the Contract cannot be either witnessed or performed (as the case may be) by the Buyer for any reason (including as a consequence of any pandemic) and the Buyer cannot delegate any third party to represent it, or to perform the tests in its name and on its behalf, the Seller may propose to the Buyer alternate measures in order to avoid delaying the testing, including but not limited to the use of electronic messaging services such as Skype, Teams or equivalent, recording devices such as cameras, and a distribution of results via electronic storage media such as DVD or streamed videos. The Buyer and the Seller shall make their best efforts to agree on such measures with a view not to delay the testing of the Products. If despite reasonable alternate measures proposed by the Seller, the Buyer instructs the Seller to suspend or postpone the performance of the tests, the Seller shall, notwithstanding anything to the contrary in the Contract, be entitled to a reasonable exten-

sion of the time for completion and compensation by the Buyer for the additional costs incurred as a result of the suspension or postponement of the affected tests.

18. Firmware, Software, Leased Equipment, Remote Diagnostic Services, PCB Services

Seller grants Buyer a non-exclusive license to use Firmware solely in connection with use of the Product for which the Firmware is provided by Seller. Buyer shall not sublicense, assign, or otherwise transfer the license to use the Firmware to any third party, except with that specific Product and to the extent such transfer is not otherwise restricted by the Contract. If Seller provides any software to Buyer other than Firmware, the Software License Addendum shall apply. If Seller leases any of Seller's equipment or provides related Services to Buyer, including placing Seller's equipment at Buyer's site to provide remote Services, the Lease Addendum shall apply. If Seller provides remote diagnostic services to Buyer, the Remote Diagnostic Services Addendum shall apply. If Seller provides PCB Services to Buyer, the PCB Services Addendum shall apply. If there is any conflict between these "Terms and Conditions for the Sale of Products and Services, Form EM 104" and the terms of any addendum incorporated pursuant to this Article 18, the terms of the addendum shall take precedence with respect to the applicable scope.

19. General Clauses

19.1 Products and Services sold by Seller are not intended for use in connection with any nuclear facility or activity, and Buyer warrants that it shall not use or permit others to use Products or Services for such purposes, without the advance written consent of Seller. If, in breach of this, any such use occurs, Seller (and its parent, affiliates, suppliers and subcontractors) disclaims all liability for any nuclear or other damage, injury or contamination, and, in addition to any other rights of Seller, Buyer shall indemnify and hold Seller (and its parent, affiliates, suppliers and subcontractors) harmless against all such liability. Consent of Seller to any such use, if any, will be conditioned upon additional terms and conditions that Seller determines to be acceptable for protection against nuclear liability.

19.2 Seller may assign or novate its rights and obligations under the Contract, in whole or in part, to any of its affiliates or may assign any of its accounts receivable under this Contract to any party without Buyer's consent. Buyer agrees to execute any documents that may be necessary to complete Seller's assignment or novation. Seller may subcontract portions of the work, so long as Seller remains responsible for it. The delegation or assignment by Buyer of any or all of its rights or obligations under the Contract without Seller's prior written consent (which consent shall not be unreasonably withheld) shall be void.

19.3 Buyer shall notify Seller immediately upon any change in ownership of more than fifty percent (50%) of Buyer's voting rights or of any controlling interest in Buyer. If Buyer fails to do so or Seller objects to the change, Seller may (a) terminate the Contract, (b) require Buyer to provide adequate assurance of performance (including but not limited to payment), and/or (c) put in place special controls regarding Seller's Confidential Information.

19.4 If any Contract provision is found to be void or unenforceable, the remainder of the Contract shall not be affected. The parties will endeavor to replace any such void or unenforceable provision with a new provision that achieves substantially the same practical and economic effect and is valid and enforceable.

19.5 The following Articles shall survive termination or cancellation of the Contract: 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16, 18, 19 and 20.

19.6 The Contract represents the entire agreement between the parties. No oral or written representation or warranty not contained in this Contract shall be binding on either party. Buyer's and Seller's rights, remedies and obligations arising from or related to Products and Services sold under this Contract are limited to the rights, remedies and obligations stated in this Contract. No modification, amendment, rescission or waiver shall be binding on either party unless agreed in writing.

19.7 Except as provided in Article 15 (Limitations of Liability) and in Section 19.1 (no nuclear use), this Contract is only for the benefit of the parties, and no third party shall have a right to enforce any provision of this Contract, whether under the English Contracts (Rights of Third Parties) Act of 1999 or otherwise.

19.8 This Contract may be signed in multiple counterparts that together shall constitute one agreement. If permitted by applicable laws, the Contract may be signed by the parties using certified digital signature tools such as DocuSign, or any other agreed upon certified means.

20. US Government Contracts

20.1 This Article 20 applies only if the Contract is for the direct or indirect sale to any agency of the U.S. government and/or is funded in whole or in part by any agency of the U.S. government.

20.2 Buyer agrees that all Products and Services provided by Seller meet the definition of "commercial-off-the-shelf" ("COTS") or "commercial item" as those terms are defined in Federal Acquisition Regulation ("FAR") 2.101. Unless otherwise specifically stated by Seller

in this Contract, Seller makes no representation or warranty as to the country of origin of Products. Buyer agrees any Services offered by Seller are exempt from the Service Contract Act of 1965 (FAR 52.222-41). The version of any applicable FAR clause listed in this Article 20 shall be the one in effect on the effective date of this Contract.

20.3 If Buyer is an agency of the U.S. Government, then as permitted by FAR 12.302, Buyer agrees that all paragraphs of FAR 52.212-4 (except those listed in 12.302(b)) are replaced with these Terms and Conditions. Buyer further agrees the subparagraphs of FAR 52.212-5 apply only to the extent applicable for sale of COTS and/or commercial items and as appropriate for the Contract Price.

20.4 If Buyer is procuring the Products or Services as a contractor, or subcontractor at any tier, on behalf of any agency of the U.S. Government, then Buyer agrees that FAR 52.212-5(e) or 52.244-6 (whichever is applicable) applies only to the extent applicable for sale of COTS and/or commercial items and as appropriate for the Contract Price.