DANE COUNTY DEPARTMENT of PUBLIC WORKS, HIGHWAY and TRANSPORTATION

County Executive
Joseph T. Parisi

1919 Alliant Energy Center Way ◆ Madison, Wisconsin 53713
Phone: (608) 266-4018 ◆ Fax: (608) 267-1533

Commissioner / Director
Gerald J. Mandli

April 26, 2017

ATTENTION ALL REQUEST FOR BID (RFB) HOLDERS

RFB NO. 316055 - ADDENDUM NO. 1

ELECTRICAL WORK FOR GENERATOR BUILDING

DANE COUNTY LANDFILL SITE #1

4650 MAPLE GROVE ROAD

VERONA, WISCONSIN

BIDS DUE: TUESDAY, MAY 16, 2017, 2:00 PM.
DUE DATE AND TIME **ARE** CHANGED BY THIS ADDENDUM

This Addendum is issued to modify, explain or clarify the original Request for Bid (RFB) and is hereby made a part of the RFB. **Bidders must acknowledge this addendum on the bid form.**

PLEASE MAKE THE FOLLOWING CHANGES:

1. **Bid Form**
   Remove Bid Form; replace with new Bid Form, issued with this Addendum. The revised sheet is marked "Addendum No. 1". The new form has been revised as follows:

   Dates removed and replaced to match Specifications

2. **Public Works Construction Contract**
   Remove Public Works Construction Contract; replace with new Public Works Construction Contract, issued with this Addendum. The revised sheet is marked "Addendum No. 1". The new form has been revised as follows:

   Liquidated damages dates removed and replaced to match Specifications.

3. **Department Section 26 05 00 – Common Work Results for Electrical**
   Remove Department Section 26 05 00; replace with new Department Section 26 05 00, issued with this Addendum. The revised sheet is marked "Addendum No. 1". The new section has been revised as follows:

   Construction schedule and electrical equipment relocation clarification.

4. **Appendix A –Electrical Switchgear and Control Equipment Drawings**
   Appendix A, attached, is made part of this RFB.

Enclosures

Bid Form, Revised 4/26/17
Public Works Construction Contract, Revised 4/26/17
Department Section 26 05 00 – Common Work Results for Electrical, Revised 4/26/17
Appendix A – Electrical Switchgear and Control Equipment Drawings

If any additional information about this Addendum is needed, please contact Ali Hackner at (608) 514-2319, or Hackner.Allison@countyofdane.com.

Name of Bidding Firm: _____

BID FORM

BID NO. 316055
PROJECT: ELECTRICAL WORK FOR GENERATOR BUILDING
DANE COUNTY LANDFILL SITE #1

TO: DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY & TRANSPORTATION PROJECT MANAGER
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713

NOTE: WISCONSIN STATUTE 77.54 (9M) ALLOWS FOR NO SALES & USE TAX ON THE PURCHASE OF MATERIALS FOR COUNTY PUBLIC WORKS PROJECTS.

ELECTRICAL BASE BID - LUMP SUM:
Dane County is inviting Bids for electrical construction services at the landfill power generation plant located in Verona. The undersigned, having examined the site where the Work is to be executed and having become familiar with local conditions affecting the cost of the Work and having carefully examined the Drawings and Specifications, all other Construction Documents and Addenda thereto prepared by Dane County Department of Public Works, Highway & Transportation hereby agrees to provide all labor, materials, equipment and services necessary for the complete and satisfactory execution of the entire Work, as specified in the Construction Documents, for the Base Bid stipulated sum of:

_____ and _____ /100 Dollars
Written Price

$_____
Numeric Price

Receipt of the following addenda and inclusion of their provisions in this Bid is hereby acknowledged:

Addendum No(s). _____ through _____

Dated _____

Dane County Solid Waste Division must have this project completed by September 29, 2017. Assuming this Work can be started by July 31, 2017, what dates can you commence and complete this job?

Commencement Date: _____ Completion Date: _____
(final, not substantial)

I hereby certify that all statements herein are made on behalf of:

_____
(Name of Corporation, Partnership or Person submitting Bid)

Select one of the following:
1. A corporation organized and existing under the laws of the State of _____, or

2. A partnership consisting of _____, or

3. A person conducting business as _____;

Of the City, Village, or Town of _____ of the State of _____.

I have examined and carefully prepared this Bid from the associated Construction Documents and have checked the same in detail before submitting this Bid; that I have full authority to make such statements and submit this Bid in (its) (their) (my) behalf; and that the said statements are true and correct. In signing this Bid, we also certify that we have not, either directly or indirectly, entered into any agreement or participated in any collusion or otherwise taken any action in restraint of free competition; that no attempt has been made to induce any other person or firm to submit or not to submit a Bid; that this Bid has been independently arrived at without collusion with any other bidder, competitor, or potential competitor; that this Bid has not been knowingly disclosed prior to the Bids Due Date to another bidder or competitor; that the above statement is accurate under penalty of perjury.

The undersigned further agrees to honor the Base Bid and the Alternate Bid(s) for sixty (60) calendar days from date of Award of Contract.

SIGNATURE: _____
(Bid is invalid without signature)

Print Name: _____ Date: _____

Title: _____

Address: _____

Telephone No.: _____ Fax No.: _____

Email Address: _____

Contact Person: _____

THIS PAGE IS FOR BIDDERS' REFERENCE AND NEED NOT BE SUBMITTED WITH BID FORM.

BID CHECK LIST:
These items **must** be included with Bid:
☐ Bid Form ☐ Bid Bond ☐ Fair Labor Practices Certification

BIDDERS SHOULD BE AWARE OF THE FOLLOWING:

DANE COUNTY VENDOR REGISTRATION PROGRAM

Any person bidding on any County contract must be registered with the Dane County Purchasing Division & pay an annual registration fee. A contract will not be awarded to an unregistered vendor. Obtain a *Vendor Registration Form* by calling 608/266-4131 or complete a new form or renewal online at:
www.danepurchasing.com/registration

DANE COUNTY BEST VALUE CONTRACTING PRE-QUALIFICATION

Contractors must be pre-qualified as a Best Value Contractor with the Dane County Public Works Engineering Division before the award of contract. Obtain a *Best Value Contracting Application* by calling 608/266-4018 or complete one online at:
www.countyofdane.com/pwht/BVC_Application.aspx

EQUAL BENEFITS REQUIREMENT

By submitting a Bid, the contractor acknowledges that a condition of this contract is to provide equal benefits as required by Dane County Code of Ordinances Chapter 25.016. Contractor shall provide equal benefits as required by that Ordinance to all required employees during the term of the contract. Equal Benefits Compliance Payment Certification shall be submitted with final pay request. For more information:
www.danepurchasing.com/partner_benefit.aspx

COUNTY OF DANE

PUBLIC WORKS CONSTRUCTION CONTRACT

Contract No. _____ Bid No. 316055

Authority: 2016 RES -_____

THIS CONTRACT, made and entered into as of the date by which authorized representatives of both parties have affixed their signatures, by and between the County of Dane (hereafter referred to as "COUNTY") and [_____] (hereafter, "CONTRACTOR"), and

W I T N E S S E T H :

WHEREAS, COUNTY, whose address is c/o Assistant Public Works Director, 1919 Alliant Energy Center Way, Madison, WI 53713, desires to have CONTRACTOR provide Electrical Work for Generator Building at Dane County Landfill Site #1 ("the Project"); and

WHEREAS, CONTRACTOR, whose address is _____ _____ is able and willing to construct the Project, in accordance with the Construction Documents;

NOW, THEREFORE, in consideration of the above premises and the mutual covenants of the parties hereinafter set forth, the receipt and sufficiency of which is acknowledged by each party for itself, COUNTY and CONTRACTOR do agree as follows:

1. CONTRACTOR agrees to construct, for the price of $[_____] the Project and at the CONTRACTOR'S own proper cost and expense to furnish all materials, supplies, machinery, equipment, tools, superintendence labor, insurance, and other accessories and services necessary to complete the Project in accordance with the conditions and prices stated in the Bid Form, General Conditions of Contract, the drawings which include all maps, plats, plans, and other drawings and printed or written explanatory matter thereof, and the specifications therefore as prepared by AC Engineers (hereinafter referred to as "the Architect / Engineer"), and as enumerated in the Project Manual Table of Contents, all of which are made a part hereof and collectively evidence and constitute the Contract.

2. COUNTY agrees to pay the CONTRACTOR in current funds for the performance of the Contract subject to additions and deductions, as provided in the General Conditions of Contract, and to make payments on account thereof as provided in Article entitled, "Payments to Contractor" of the General Conditions of Contract.

3. Construction Timeline

Contract Dates: The Work will be substantially completed on or before September 22, 2017, and completed and ready for final payment on or before September 29, 2017. During that specified time frame, COUNTY will require four (4) weeks or twenty (20) consecutive business days for equipment relocation and gas piping installation. During that time, CONTRACTOR shall not be permitted on-site.

Liquidated Damages: Contractor and Owner recognize that time is of the essence and that Owner will suffer financial and other losses if the Work is not completed within the

times specified above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Contractor shall pay Owner $1,000 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion until the Work is substantially complete.

2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner $1,000 for each day that expires after such time until the Work is completed and ready for final payment.

3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

4. During the term of this Contract, CONTRACTOR agrees to take affirmative action to ensure equal employment opportunities. The CONTRACTOR agrees in accordance with Wisconsin Statute 111.321 and Chapter 19 of the Dane County Code of Ordinances not to discriminate on the basis of age, race, ethnicity, religion, color, gender, disability, marital status, sexual orientation, national origin, cultural differences, ancestry, physical appearance, arrest record or conviction record, military participation or membership in the national guard, state defense force or any other reserve component of the military forces of the United States, or political beliefs. Such equal opportunity shall include, but not be limited to, the following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation. CONTRACTOR agrees to post in conspicuous places, available to all employees and applicants for employment, notices setting forth the provisions of this paragraph.

5. CONTRACTOR shall file an Affirmative Action Plan with the Dane County Contract Compliance Officer in accord with Chapter 19 of the Dane County Code of Ordinances. CONTRACTOR must file such plan within fifteen (15) business days of the effective date of this Contract. During the term of this Contract CONTRACTOR shall also provide copies of all announcements of employment opportunities to COUNTY'S Contract Compliance Office, and shall report annually the number of persons, by race, ethnicity, gender, and disability status, which apply for employment and, similarly classified, the number hired and number rejected.

6. During the term of this Contract, all solicitations for employment placed on CONTRACTOR'S behalf shall include a statement to the effect that CONTRACTOR is an "Equal Opportunity Employer".

7. CONTRACTOR agrees to comply with provisions of Chapter 25.016 of the Dane County Code of Ordinances, which pertains to domestic partnership benefits.

8. CONTRACTOR agrees to furnish all information and reports required by COUNTY'S Contract Compliance Officer as the same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Code of Ordinances, and the provisions of this Contract.

9. CONTRACTOR agrees that all persons employed by CONTRACTOR or any subcontractor shall be paid no less than the minimum wage established under Chapter 40, Subchapter II, Dane County Code of Ordinances. CONTRACTOR agrees to abide by and comply with the provisions of Chapter 40, Subchapter II of the Dane County Code of Ordinances, and said Subchapter is fully incorporated herein by reference.

10. This Contract is intended to be a Contract solely between the parties hereto and for their benefit only. No part of this Contract shall be construed to add to, supplement, amend, abridge or repeal existing rights, benefits or privileges of any third party or parties including, but not limited to, employees of either of the parties.

11. The entire agreement of the parties is contained herein and this Contract supersedes any and all oral agreements and negotiations between the parties relating to the subject matter hereof. The parties expressly agree that the express terms of this Contract shall not be amended in any fashion except in writing, executed by both parties.

12. CONTRACTOR must be pre-qualified as a Best Value Contractor with Dane County Public Works Engineering Division before award of Contract. Subcontractors must be pre-qualified ten (10) business days prior to commencing Work under this Contract.

IN WITNESS WHEREOF, COUNTY and CONTRACTOR, by their respective authorized agents, have caused this Contract and its Schedules to be executed, effective as of the date by which all parties hereto have affixed their respective signatures, as indicated below.

* * * * * * *

FOR CONTRACTOR:

Signature Date

Printed or Typed Name and Title

Signature Date

Printed or Typed Name and Title

NOTE: If CONTRACTOR is a corporation, Secretary should attest. In accordance with IRS Regulations, unincorporated entities are required to provide either their Social Security or Employer Number in order to receive payment for services rendered.

* * * * * * *

This Contract is not valid or effectual for any purpose until approved by the appropriate authority designated below, and no work is authorized until the CONTRACTOR has been given notice to proceed by COUNTY'S Assistant Public Works Director.

FOR COUNTY:

Joseph T. Parisi, County Executive Date

Scott McDonell, County Clerk Date

SECTION 26 05 00
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.1 SUMMARY

A. Dane County Public Works seeks to modify the electrical generation site in Verona, Wisconsin. The existing site generates electricity from two (2) generators fueled by landfill gas for sale to the local electrical utility. The site shall be upgraded by relocating some of the existing equipment into a new generator building already constructed on-site.

B. No running water or toilet facilities shall be provided by Dane County. Construction power (208/120 Volt AC) shall be supplied by Dane County from an existing panel board. County to hire private utility locator for electrical and communication lines.

C. Contractor shall connect existing ground wires in new generator building to main electrical service panel. Contractor to disconnect and reconnect electrical control equipment, County to relocate. Coordination and arc flash studies are not included.

D. Per Wisconsin Department of Natural Resources (WNDR), Dane County is required to comply with air permits regarding landfill gas. Power to the existing flare shall be maintained throughout the entirety of the project. If it becomes necessary to disconnect power to flare, Project Manager shall be notified 72 hours prior to disconnect so Dane County can obtain temporary power. Contractor shall conduct work as to minimize use of temporary power to flare.

E. Since the landfill gas will not be able to be used for fueling the generators during the time of construction, the electrical contractor must be ready to disconnect existing wires and reconnect them within a six (6) week window since the generators will be out of service during this time period. A timeline for construction is listed below, Dane County will require four (4) weeks for equipment relocation and gas piping installation where Contractor shall be restricted from site.

Start Date: July 31, 2017
Week 1-2: Electrical Contractor to rough-in to farthest extent possible
August 14, 2017: Electrical service disconnected
Week 3-6: County to relocate equipment and install gas piping
Week 7-8: Electrical Contractor to finish Work
Substantial Completion: September 22, 2017
Final Completion: September 29, 2017

Liquidated damages associated with this project are outlined in Article 3 of Public Works Construction Contract.

F. Drawings E1 and E2 outline the electric system as it currently exists and the work that needs to be performed. The cable runs shown in red are new cable runs to be provided by Contractor.

G. Items addressed under separate contracts include; communication system and circuits for lights, outlets, heaters, blowers, and exhaust fans.

1.2 QUALITY ASSURANCE

A. All work shall be performed to the current National Electrical Code.

1.3 COORDINATION

A. Coordinate activities with A/E (AC Engineering), as specified in 26 05 00 Specifications.

PART 2 PRODUCTS

2.1 CONDUIT

A. All conduits shall be EMT

2.2 CABLES

A. All cables shall be copper

2.3 UNDERGROUND DUCTS

A. All underground ducts shall be PVC.

2.4 CONTROL WIRING

A. All control wiring to be with ring type insulated terminators.

2.5 GROUND GRID

A. Install 12 foot copper clad ground rods in a standard triangular configuration.

B. The cable shall be exothermically welded to the ground rods.

C. After the ground grid is installed, it shall be tested by A/E for acceptance.

2.6 HIGH VOLTAGE CABLE

A. New cable similar in rating to existing cable between the 150 KVA and 750 KVA transformer. Submit to A/E for approval prior to purchase. **Note: these are to be single phase cables.**

B. EPR/PVC Power Cable with copper tape shield, MV105, 133% insulation level, 220 mils, 15 KV, 1/0 copper conductor. Also include compatible elbow terminations at both ends of the cable run.

2.7 HIGH VOLTAGE TERMINATION

A. Match to existing elbow cable terminators. Submit to A/E for approval prior to purchase. The cable and terminator shall be tested by A/E prior to being energized.

2.8 TRANSFORMER

A. Accepted manufacturers: Eaton/Cutler Hammer, Square D, or A/E approved equal.

B. Quantity: 1 - 75 KVA transformer

C. Note: To be connected 480/277 – 208/120 Wye/Wye, Dry type, 150 degree C rise

2.9 480/277 VOLT PANEL BOARD

A. Accepted manufacturers: Eaton/Cutler Hammer, Square D, or A/E approved equal.

B. Quantities:

1 - 3P Main breaker	100 Amperes
10 - 3P Feeder breakers	30 Amperes
2 - 3P Feeder breakers	20 Amperes
2 - 3P Feeder breakers	15 Amperes

C. Note: Fully rated at 10,000 AIC

2.10 208/120 VOLT PANEL BOARD

A. Accepted manufacturers: Eaton/Cutler Hammer, Square D, or A/E approved equal.

B. Quantities:

1 - 3P Main breaker	225Amperes
4 - 1P Feeder breakers	15 Amperes

C. Note: Fully rated at 10,000 AIC

PART 3 EXECUTION

3.1 INSTALLATION

A. After Contractor receives a Notice to Proceed from Dane County, the Contractor shall rough in as much of the 15 KV cable (less elbow terminations), low voltage conduit, cable, panelboards, and 75 KVA transformer prior to power being removed from the generators.

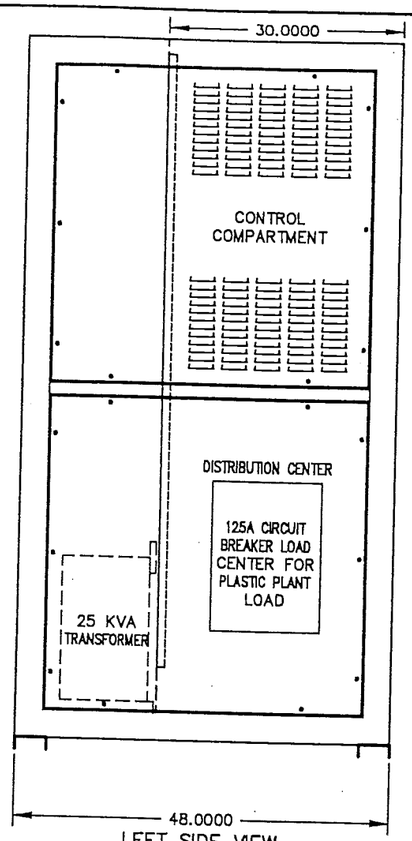
B. The Contractor shall disconnect all the electrical power from the existing equipment such as generators, electrical switchgear, switchgear electrical controls, generator coolers, flare, and gas coolers. Documentation of the current cable termination points shall be documented and approved by A/E.

C. Dane County shall move the Contractor disconnected equipment into the various new locations on the site. Dane County shall take no more than 15 working days to complete the relocation of equipment.

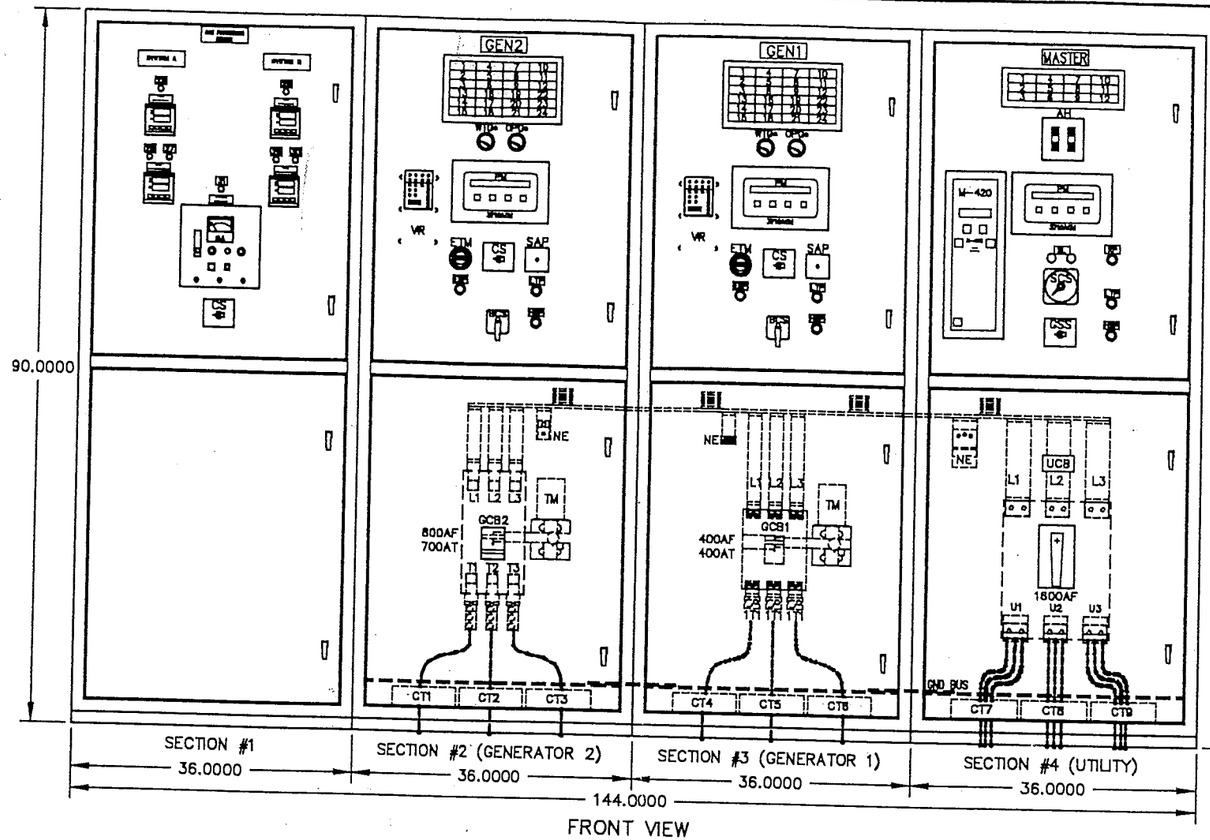
D. The Contractor shall then terminate the electrical cables with the emphasis on being able to energize the 750 KVA transformer, power and control cable runs to Generator 2. All control cables shall be terminated with the assistance of A/E personnel.

END OF SECTION

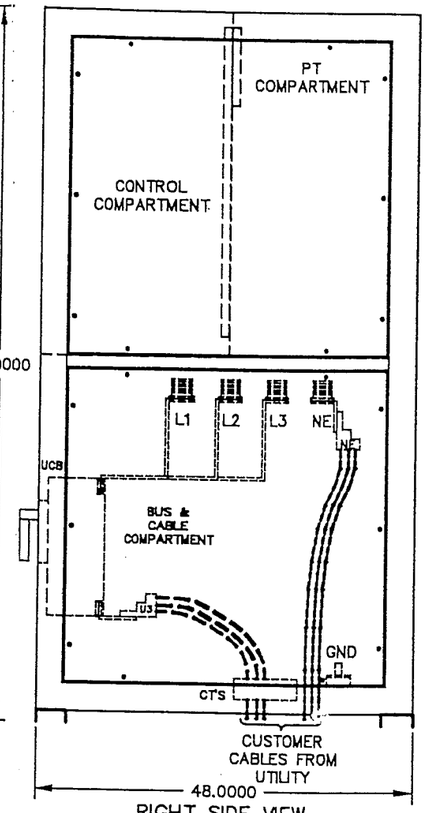
APPENDIX A – ELECTRICAL SWITCHGEAR AND CONTROL EQUIPMENT DRAWINGS



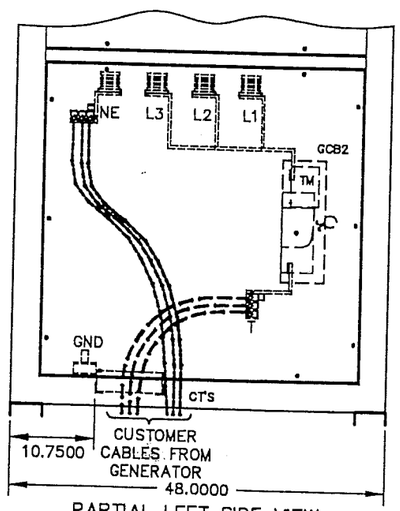
LEFT SIDE VIEW
(Showing Detail of Sec 1)



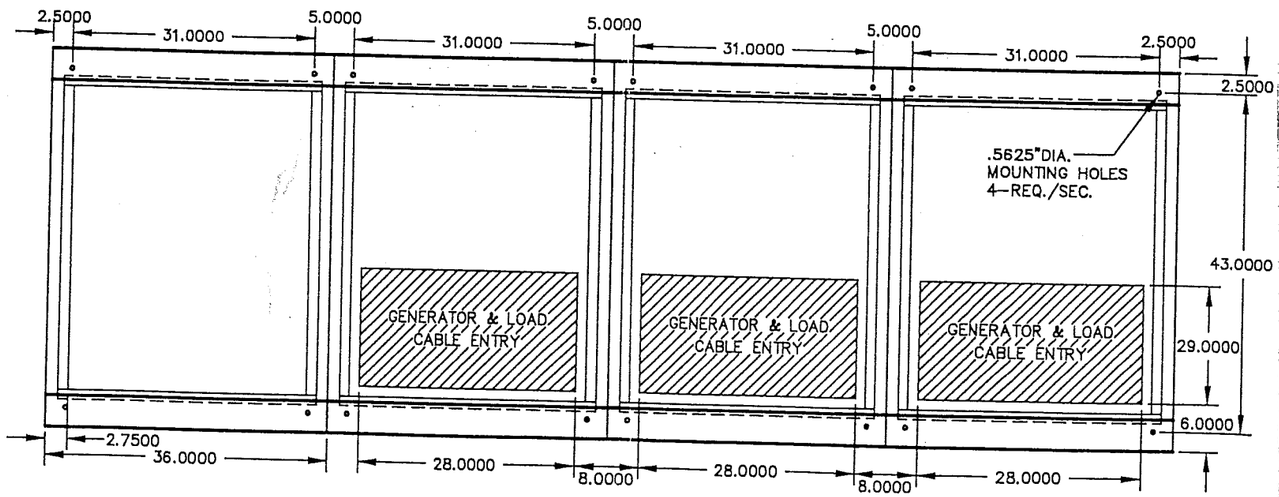
FRONT VIEW



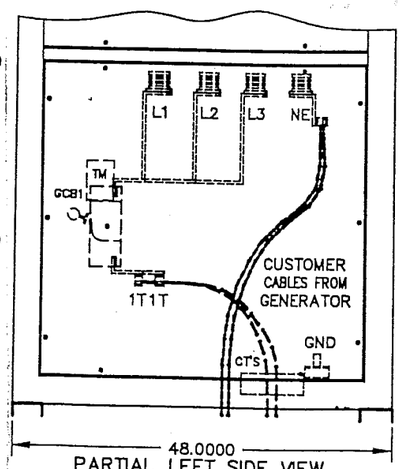
RIGHT SIDE VIEW
(Showing Detail of Sec 4)



PARTIAL LEFT SIDE VIEW
(Showing Detail of Sec 2)



BOTTOM VIEW
(Showing Mounting Holes & Recommended Cable Access Areas From Bottom)



PARTIAL LEFT SIDE VIEW
(Showing Detail of Sec 3)

DANE COUNTY
CUSTOMER

TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE .075=1	REVISIONS	BY	DATE
DATE 121384			
DR'N DM CK'D	2) CLARIFY DRAWING	WD	022095
APP'VD	1) ADDED GAS PROCESSING CTR	DJA	021495

TITLE: GENERATOR SWITCHBOARD OUTLINE

NO. 952-0148-02
SHT 1 OF 2

OUTLINE NOTES

1) SPECIFICATIONS:
   A) SWITCHGEAR IS FOR USE WITH (1) 420KW & (1) 250KW GENERATOR SETS AT 480/277VAC 3PHASE 4WIRE 60HZ.
   B) ALL CIRCUIT BREAKERS, CONTACTORS & DISCONNECT SWITCHES, IF APPLICABLE, ARE 3POLE (UNLESS NOTED).
   C) NOMENCLATURE DESCRIPTIONS, IF NOT ON THIS DRAWING (REFER TO LAKE SHORE DRAWING #952-0148-10)
   D) * = EQUIPMENT SUPPLIED BY CUSTOMER.

2) ENCLOSURE CONSTRUCTION:
   A) NEMA 1, FREE-STANDING, 14GA. SHEET METAL WITH 1.5"x4" 7 GA. CHANNEL BASE.
   B) (2) HINGED FRONT DOOR(S),
      (2) REMOVABLE REAR PANEL(S),
      (1) REMOVABLE ROOF PANEL,
      (2) REMOVABLE SIDE PANELS PER SIDE EACH SECTION AND OPEN BOTTOM FOR CABLE ENTRY.
   C) ENCLOSURE TO BE BUILT AS (1) UNIT(S), INDIVIDUAL SECTIONS CAN NOT BE SEPARATED.
   D) MOUNTING DIMENSIONS ARE ±.125" ALL OTHER DIMENSIONS ARE APPROXIMATE.

3) ENCLOSURE FINISH:
   A) PRIMED AND PAINTED ANSI 61

4) BUSING CONSTRUCTION:
   A) TO BE BUSSED PER NEC.
   B) BUS SUPPORTS TO BE GLASTIC INSULATORS (GLASTIC#1461-1A LS#3152804).
   C) BUS SUPPORT SPACING TO BE 30"MAX.
   D) MAIN BUS TO BE (1) .375"x3" COPPER BUS PER PHASE & NEUTRAL (LS#0238300).
   E) 1600A FEEDERS (UCB) TO BE (1) .375"x3" COPPER BUS PER PHASE (LS#0238300) (UNLESS NOTED).
   F) 800A FEEDERS (GCB2) TO BE (1) .375"x1.75" COPPER BUS PER PHASE (LS#0238175) (UNLESS NOTED).
   G) 400A FEEDERS (GCB1) TO BE (1) .375"x1.75" COPPER BUS PER PHASE (LS#0238175) (UNLESS NOTED).
   H) MAIN GROUND BUS TO BE (1) .25"x2" COPPER BUS (LS#0225200) (UNLESS NOTED).
   I) BUS CLEARANCES TO BE AS FOLLOWS (MIN.):
      PHASE TO PHASE 1"
      PHASE TO GROUND 1"
      NEUTRAL TO GROUND 1"

5) LUG SCHEDULE:
   A) (1) 3HOLE LUG 3/0-500MCM (LS#1553301 GE#TCAL81) PER PHASE & NEUTRAL.
   B) (1) 3HOLE LUG 300-750MCM (LS#3320113 GE#TPLUG308) PER PHASE & NEUTRAL.
   C) (1) 2HOLE LUG 2/0-600MCM (LS#1552100 GE#TCAL43) PER PHASE & NEUTRAL.
   D) (3) 1HOLE LUG 6-250MCM (LS#1551209 DA 250) PER BREAKER (GROUNG LUG).

CIRCUIT BREAKERS

BREAKERS	FRAME	TRIP	SERVES	LUGS
GCB1	400	400	GENERATOR 1	NOTE"C"
GCB2	800	700	GENERATOR 2	NOTE"A"
UCB	1600	1600	UTILITY	NOTE"B"

GENERATOR ANNUNCIATOR

1 LOPL – LOW OIL PRESSURE LIGHT (RED)
2 PLOPL – PRE-LOW OIL PRESSURE LIGHT (AMBER)
3 LOLL – LOW OIL LEVEL LIGHT (AMBER)
4 HWTL – HIGH WATER TEMPERATURE LIGHT (RED)
5 PHWTL –PRE-HIGH WATER TEMPERATURE LIGHT (AMBER)
6 LWLL – LOW WATER LEVEL LIGHT (AMBER)
7 OSL – OVERSPEED LIGHT (RED)
8 O/UFL – OVER/UNDER FREQUENCY LIGHT (RED)
9 O/UVL – OVER/UNDER VOLTAGE LIGHT (RED)
10 OCL – OVERCRANK LIGHT (RED)
11 FPL – FAILED TO PARALLEL LIGHT (RED)
12 RPL – REVERSE POWER LIGHT (RED)
13 BOL – BREAKER OPEN LIGHT (GREEN)
14 BCL – BREAKER CLOSED LIGHT (RED)
15 BTL – BREAKER TRIPPED LIGHT (AMBER)
16 BCFL – BATTERY CHARGER FAILURE LIGHT (AMBER)
17 LBVL – LOW BATTERY VOLTAGE LIGHT (AMBER)
18 SPARE – SPARE LIGHT (AMBER)
19 GFL – GROUND FAULT LIGHT (RED)
20 LWLAC – LOW WATER LEVEL AFTER COOLER LIGHT (AMBER)
21 SPARE – SPARE LIGHT (AMBER)
22 SPARE – SPARE LIGHT (AMBER)
23 SPARE – SPARE LIGHT (AMBER)
24 SPARE – SPARE LIGHT (AMBER)

LIGHTS

25 LGPL1 – LOW GAS PRESSURE LIGHT SYSTEM A (RED)
26 LGTL1 – LOW GAS TEMPERATURE LIGHT SYSTEM A (RED)
27 HGTL1 – HIGH GAS TEMPERATURE LIGHT SYSTEM A (RED)
28 LGPL2 – LOW GAS PRESSURE LIGHT SYSTEM B (RED)
29 LGTL2 – LOW GAS TEMPERATURE LIGHT SYSTEM B (RED)
30 HGTL2 – HIGH GAS TEMPERATURE LIGHT SYSTEM B (RED)
31 HOCL – HIGH OXYGEN CONTENT LIGHT (RED)

UTILITY ANNUNCIATOR

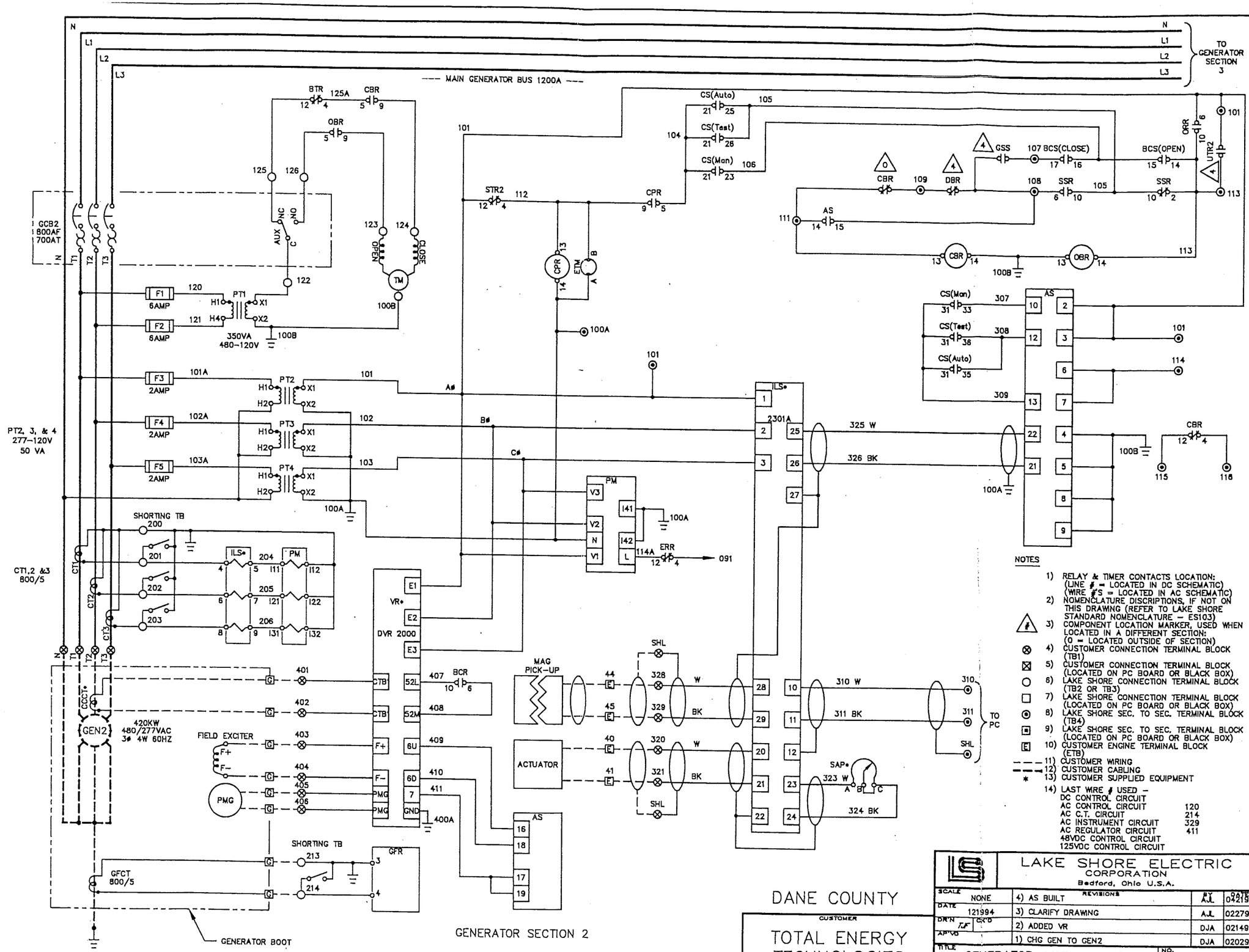
1 UBCL – UTILITY BREAKER CLOSED LIGHT (RED)
2 UBOL – UTILITY BREAKER OPEN LIGHT (GREEN)
3 SPARE – SPARE LIGHT (RED)
4 UO/UVL – UTILITY OVER/UNDER VOLTAGE LIGHT (RED)
5 UO/UFL – UTILITY OVER/UNDER FREQUENCY LIGHT (RED)
6 SPARE – SPARE LIGHT (RED)
7 RPL – REVERSE POWER LIGHT (RED)
8 PRTL – PROTECTIVE RELAY (M420) TRIPPED LIGHT (RED)
9 PRFL – PROTECTIVE RELAY (M420) FAILED LIGHT (RED)
10 PRFLL – PROTECTIVE RELAY (M420) FUSE LOSS LIGHT (RED)
11 PRPOL – PROTECTIVE RELAY (M420) POWER OK LIGHT (RED)
12 SPARE – SPARE LIGHT (RED)

DANE COUNTY
CUSTOMER
TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	121694	3) CLARIFY NOTES	AJL	030295
DR'N	CH'D	2) ADDED LWLAC LIGHT	DJA	021495
APV'D		1) ADDED LIGHTS	DJA	020295

TITLE: GENERATOR SWITCHBOARD OUTLINE
NO. 952-0148-02
SHT 2 OF 2



NOTES

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(LINE # = LOCATED IN DC SCHEMATIC)
(WIRE #'S = LOCATED IN AC SCHEMATIC)
2) NOMENCLATURE DISCRIPTIONS, IF NOT ON THIS DRAWING (REFER TO LAKE SHORE STANDARD NOMENCLATURE – ES103)
3) COMPONENT LOCATION MARKER, USED WHEN LOCATED IN A DIFFERENT SECTION:
(0 = LOCATED OUTSIDE OF SECTION)
4) CUSTOMER CONNECTION TERMINAL BLOCK (TB1)
5) CUSTOMER CONNECTION TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
6) LAKE SHORE CONNECTION TERMINAL BLOCK (TB2 OR TB3)
7) LAKE SHORE CONNECTION TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
8) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (TB4)
9) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
10) CUSTOMER ENGINE TERMINAL BLOCK (ETB)
11) CUSTOMER WIRING
12) CUSTOMER CABLING
13) CUSTOMER SUPPLIED EQUIPMENT
14) LAST WIRE # USED –

DC CONTROL CIRCUIT	
AC CONTROL CIRCUIT	120
AC C.T. CIRCUIT	214
AC INSTRUMENT CIRCUIT	329
AC REGULATOR CIRCUIT	411
48VDC CONTROL CIRCUIT	
125VDC CONTROL CIRCUIT	

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

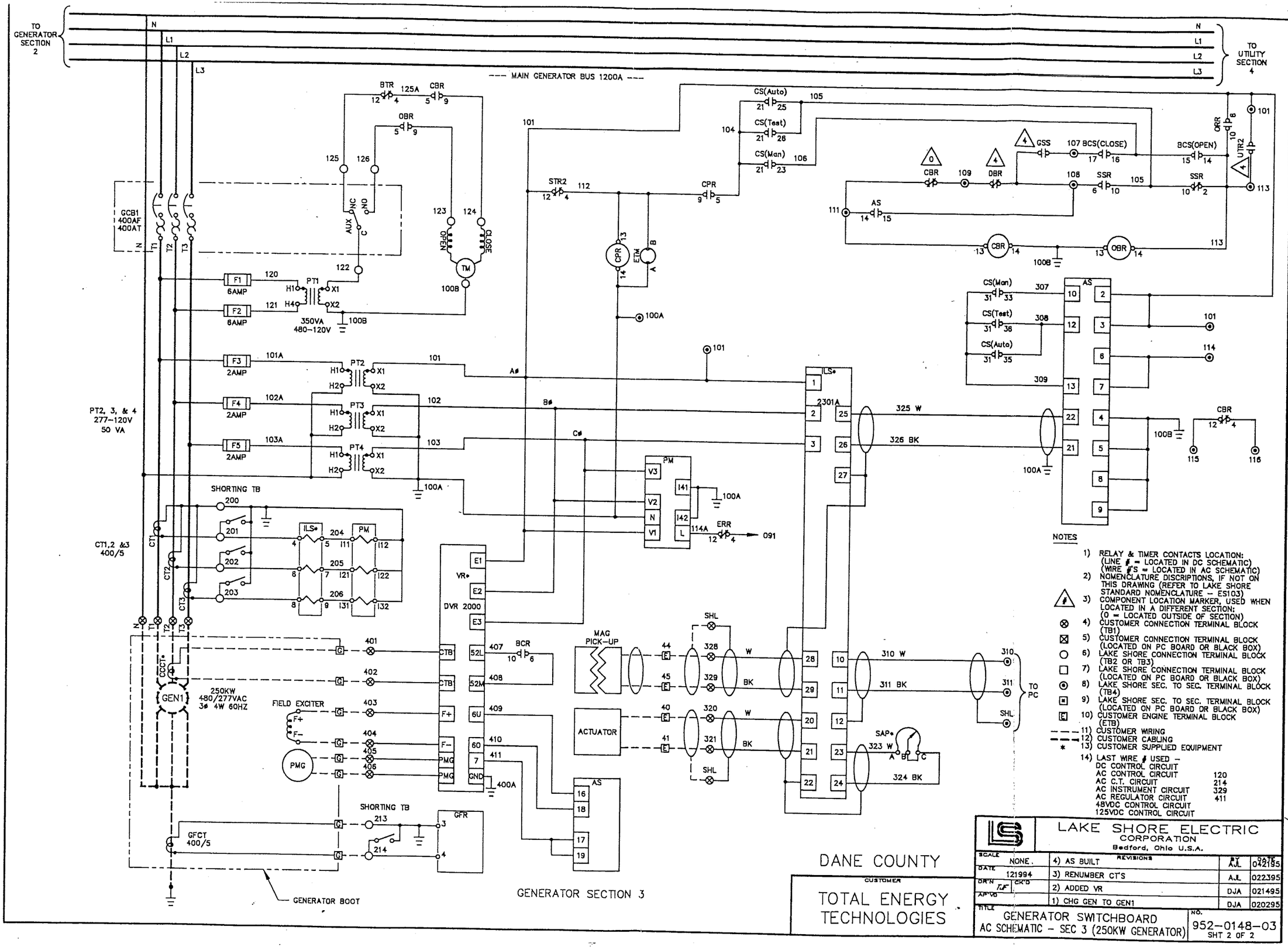
REVISIONS	BY	DATE
4) AS BUILT	AJL	042195
3) CLARIFY DRAWING	AJL	022795
2) ADDED VR	DJA	021495
1) CHG GEN TO GEN2	DJA	020295

SCALE: NONE
DATE: 121994
DR'N: TF CK'D:
APV'D:

CUSTOMER: DANE COUNTY
TOTAL ENERGY TECHNOLOGIES

TITLE: GENERATOR SWITCHBOARD
AC SCHEMATIC – SEC 2 (420KW GENERATOR)

NO. 952–0148–03
SHT 1 OF 2


TO GENERATOR SECTION 2
N
L1
L2
L3
--- MAIN GENERATOR BUS 1200A ---
TO UTILITY SECTION 4
GCB1 400AF 400AT
BTR 125A
CBR
OBR
AUX
NC
NO
C
OPEN
CLOSE
TM
100B
F1 6AMP
F2 6AMP
PT1
350VA 480–120V
F3 2AMP
F4 2AMP
F5 2AMP
PT2
PT3
PT4
PT2, 3, & 4 277–120V 50 VA
SHORTING TB
ILS*
PM
CT1,2 &3 400/5
CT1
CT2
CT3
GEN1
250KW 480/277VAC 3ø 4W 60HZ
FIELD EXCITER
PMG
GFCT 400/5
GFR
GENERATOR BOOT
DVR 2000
VR*
STR2
CPR
ETM
100A
CS(Auto)
CS(Test)
CS(Man)
GSS
BCS(CLOSE)
BCS(OPEN)
SSR
ORR
UTR2
AS
ILS*
2301A
325 W
326 BK
MAG PICK-UP
ACTUATOR
SAP*
323 W
324 BK
310 W
311 BK
TO PC
SHL
BCR
400A
NOTES
1) RELAY & TIMER CONTACTS LOCATION: (LINE # – LOCATED IN DC SCHEMATIC) (WIRE #'S – LOCATED IN AC SCHEMATIC)
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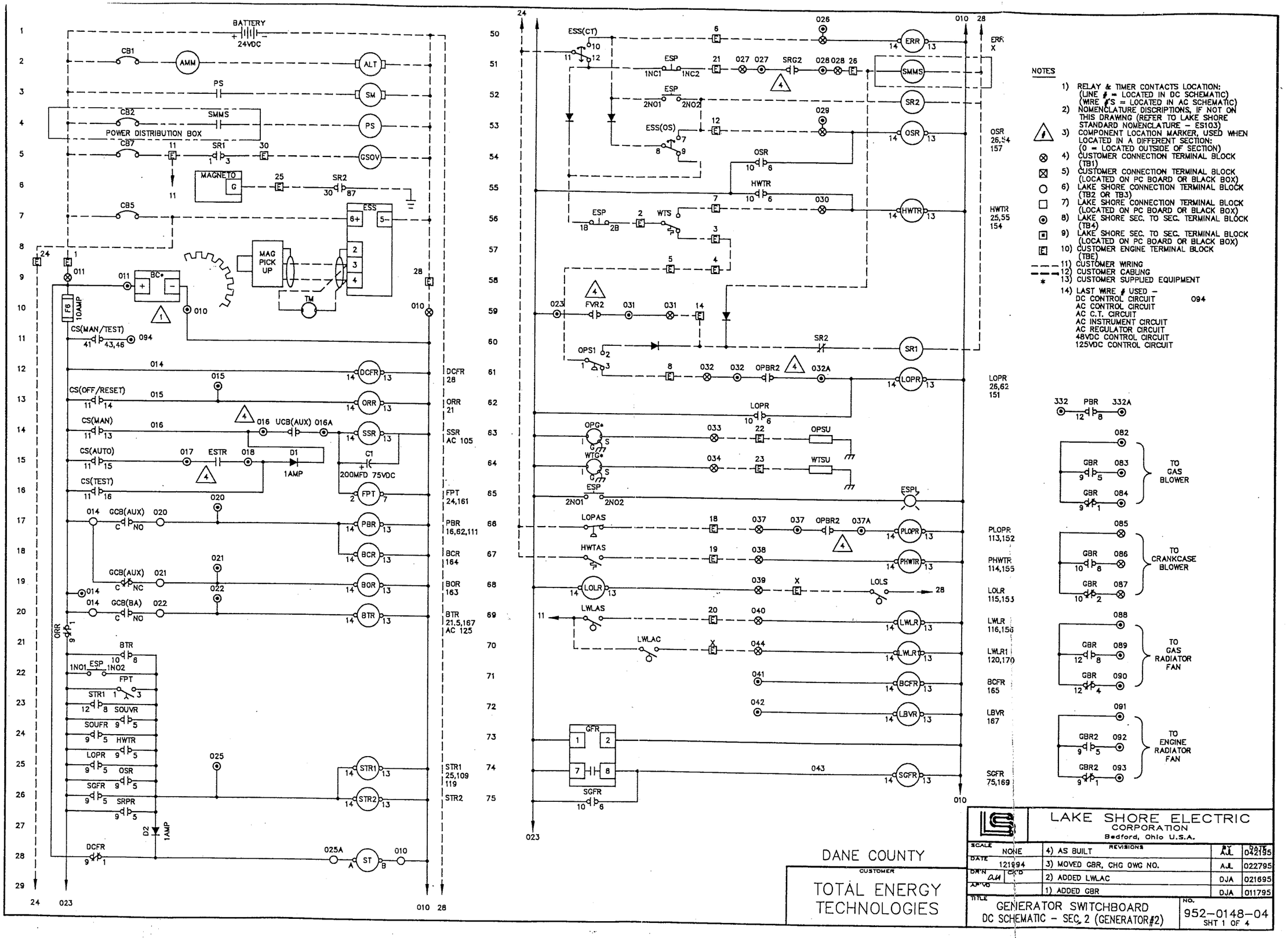
8) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (TB4)
9) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
10) CUSTOMER ENGINE TERMINAL BLOCK (ETB)
11) CUSTOMER WIRING
12) CUSTOMER CABLING
13) CUSTOMER SUPPLIED EQUIPMENT
14) LAST WIRE # USED –
DC CONTROL CIRCUIT 120
AC CONTROL CIRCUIT 214
AC C.T. CIRCUIT 329
AC INSTRUMENT CIRCUIT 411
AC REGULATOR CIRCUIT
48VDC CONTROL CIRCUIT
125VDC CONTROL CIRCUIT
LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.
SCALE NONE
DATE 121994
DR'N TJF CK'D
APV'D
REVISIONS
4) AS BUILT AJL 042195
3) RENUMBER CT'S AJL 022395
2) ADDED VR DJA 021495
1) CHG GEN TO GEN1 DJA 020295
TITLE GENERATOR SWITCHBOARD AC SCHEMATIC – SEC 3 (250KW GENERATOR)
NO. 952–0148–03
SHT 2 OF 2
DANE COUNTY
CUSTOMER
TOTAL ENERGY TECHNOLOGIES
GENERATOR SECTION 3

216 232
6200



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7) LAKE SHORE CONNECTION TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
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9) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
10) CUSTOMER ENGINE TERMINAL BLOCK (TBE)
11) CUSTOMER WIRING
12) CUSTOMER CABLING
13) CUSTOMER SUPPLIED EQUIPMENT
14) LAST WIRE # USED –
DC CONTROL CIRCUIT 094
AC CONTROL CIRCUIT
AC C.T. CIRCUIT
AC INSTRUMENT CIRCUIT
AC REGULATOR CIRCUIT
48VDC CONTROL CIRCUIT
125VDC CONTROL CIRCUIT

DANE COUNTY

CUSTOMER

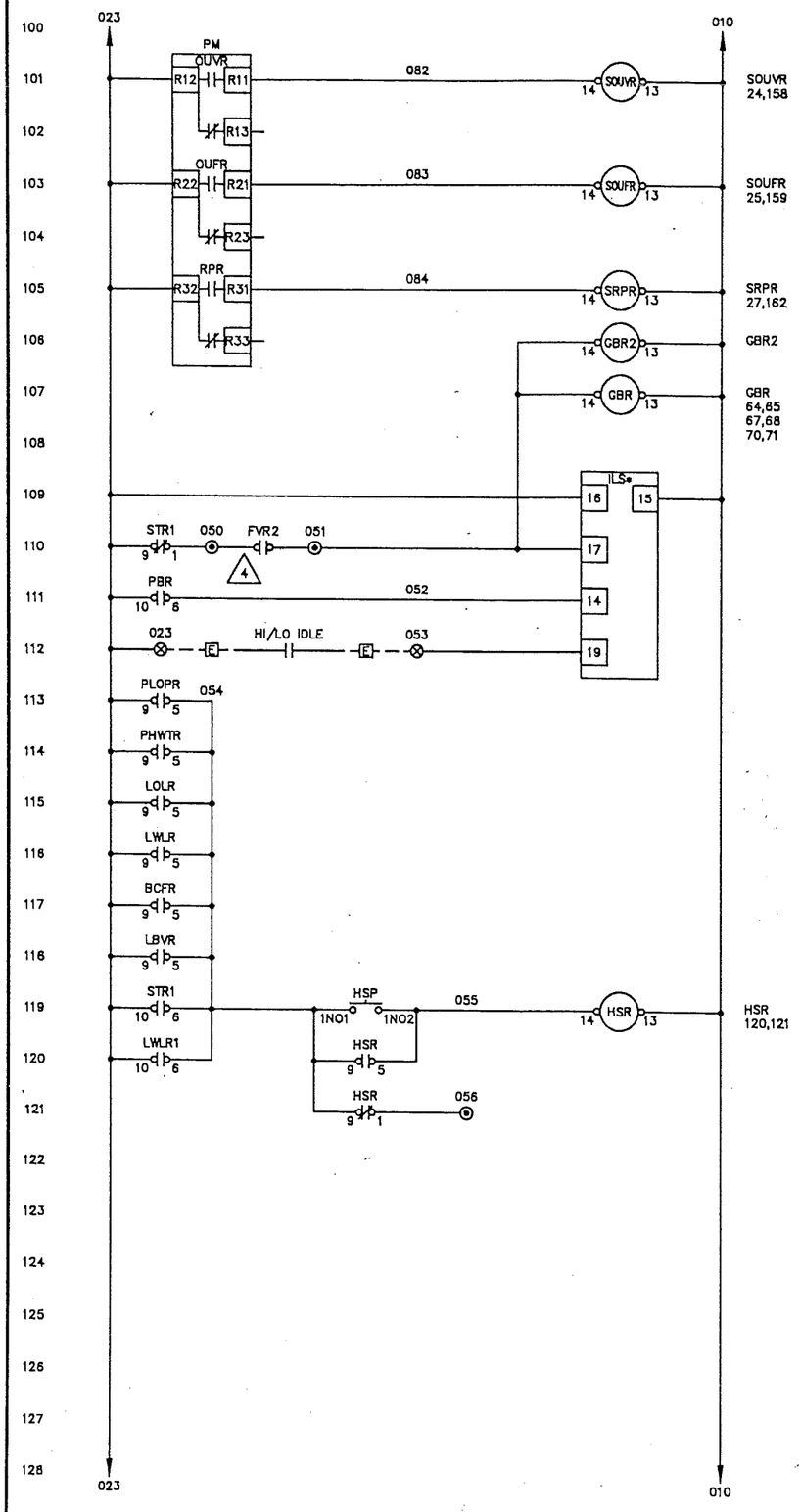
TOTAL ENERGY TECHNOLOGIES

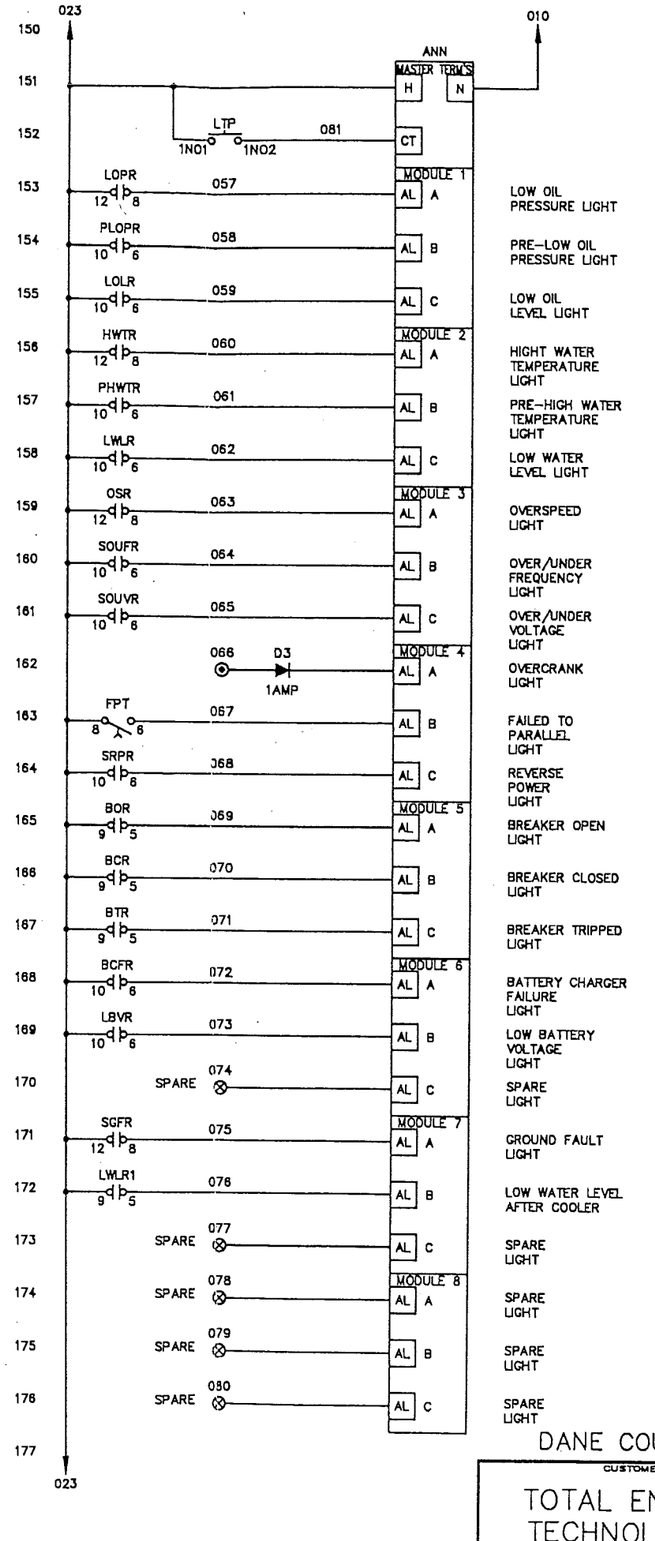
LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	121894	4) AS BUILT	AJL	042195
DR'N	CHK'D	3) MOVED GBR, CHG DWG NO.	AJL	022795
APV'D		2) ADDED LWLAC	DJA	021695
		1) ADDED GBR	DJA	011795

TITLE: GENERATOR SWITCHBOARD DC SCHEMATIC – SEC. 2 (GENERATOR #2)

NO. 952–0148–04 SHT 1 OF 4





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10) CUSTOMER ENGINE TERMINAL BLOCK (ETB)
11) CUSTOMER WIRING
12) CUSTOMER CABLING
13) CUSTOMER SUPPLIED EQUIPMENT
14) LAST WIRE # USED -
DC CONTROL CIRCUIT 094
AC CONTROL CIRCUIT
AC C.T. CIRCUIT
AC INSTRUMENT CIRCUIT
AC REGULATOR CIRCUIT
48VDC CONTROL CIRCUIT
125VDC CONTROL CIRCUIT

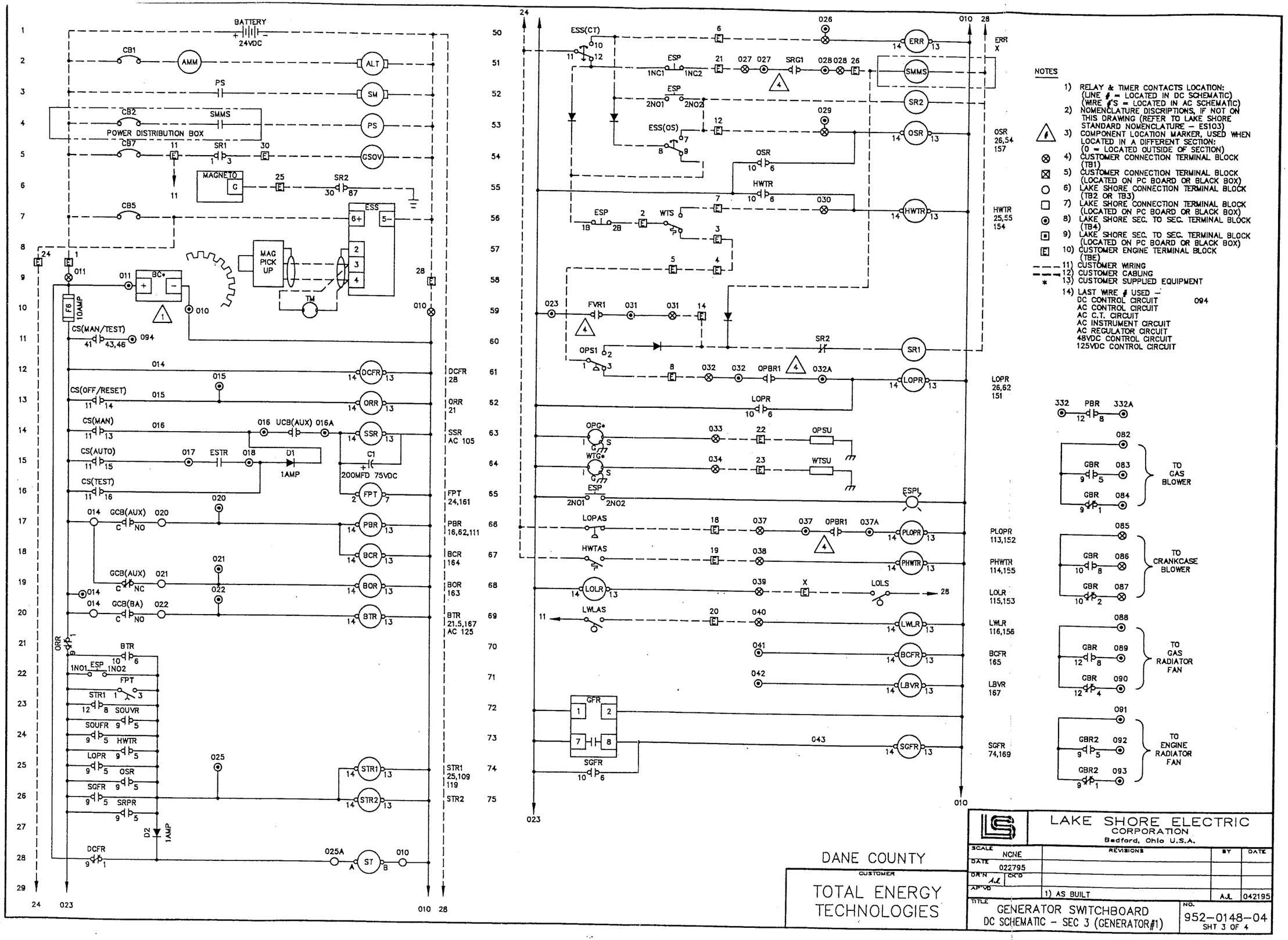
DANE COUNTY
CUSTOMER

TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	121994	3) AS BUILT	AJL	042195
DR'N DJA	CK'D	2) ADD GBR & GBR2, CLARIFY	AJL	022795
APVD		1) ADDED LWLR1	DJA	021695

TITLE: GENERATOR SWITCHBOARD DC SCHEMATIC - SEC 2 (GENERATOR #2)
NO. 952-0148-04 SHT 2 OF 4



DANE COUNTY

CUSTOMER

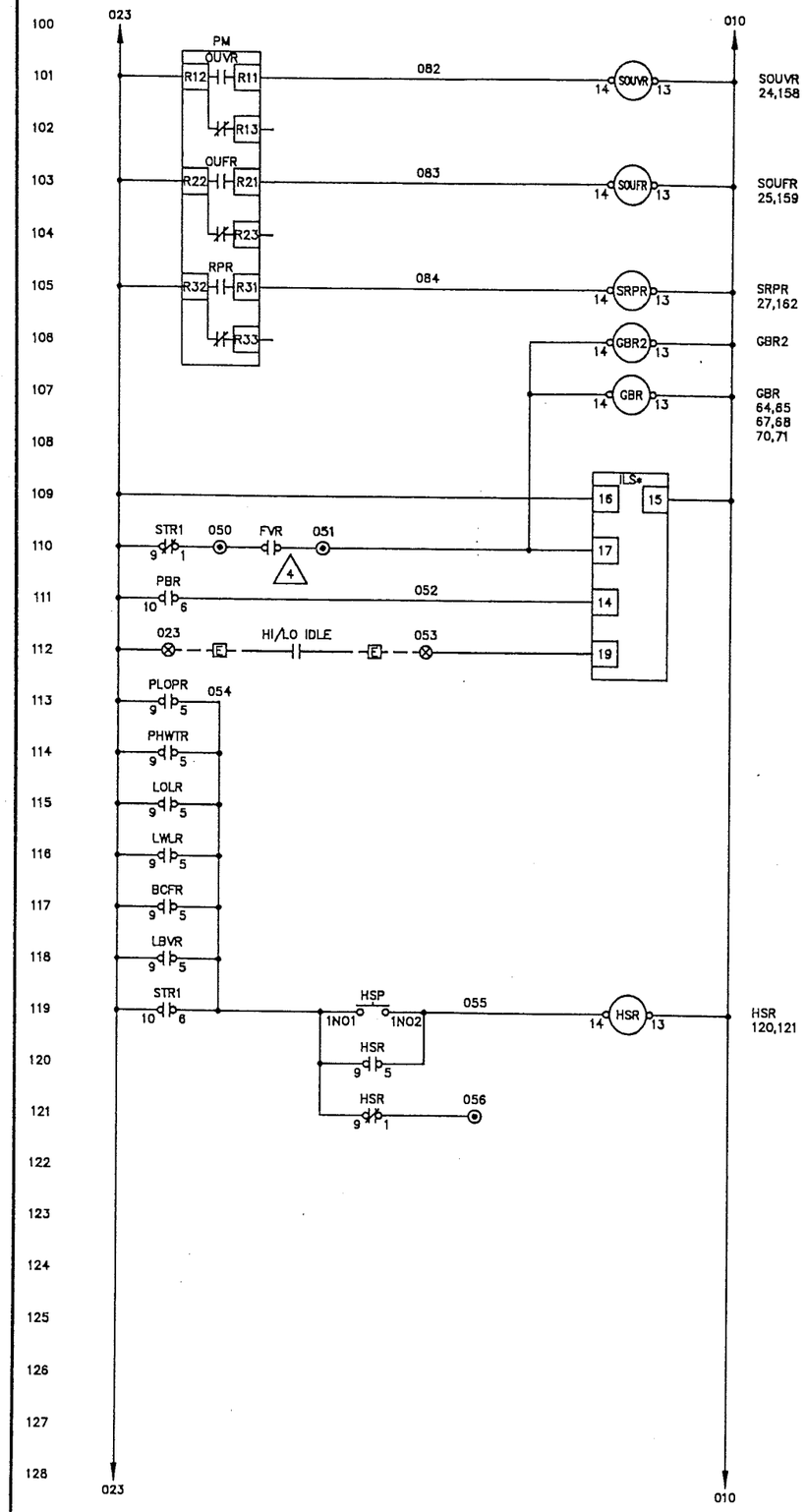
TOTAL ENERGY TECHNOLOGIES

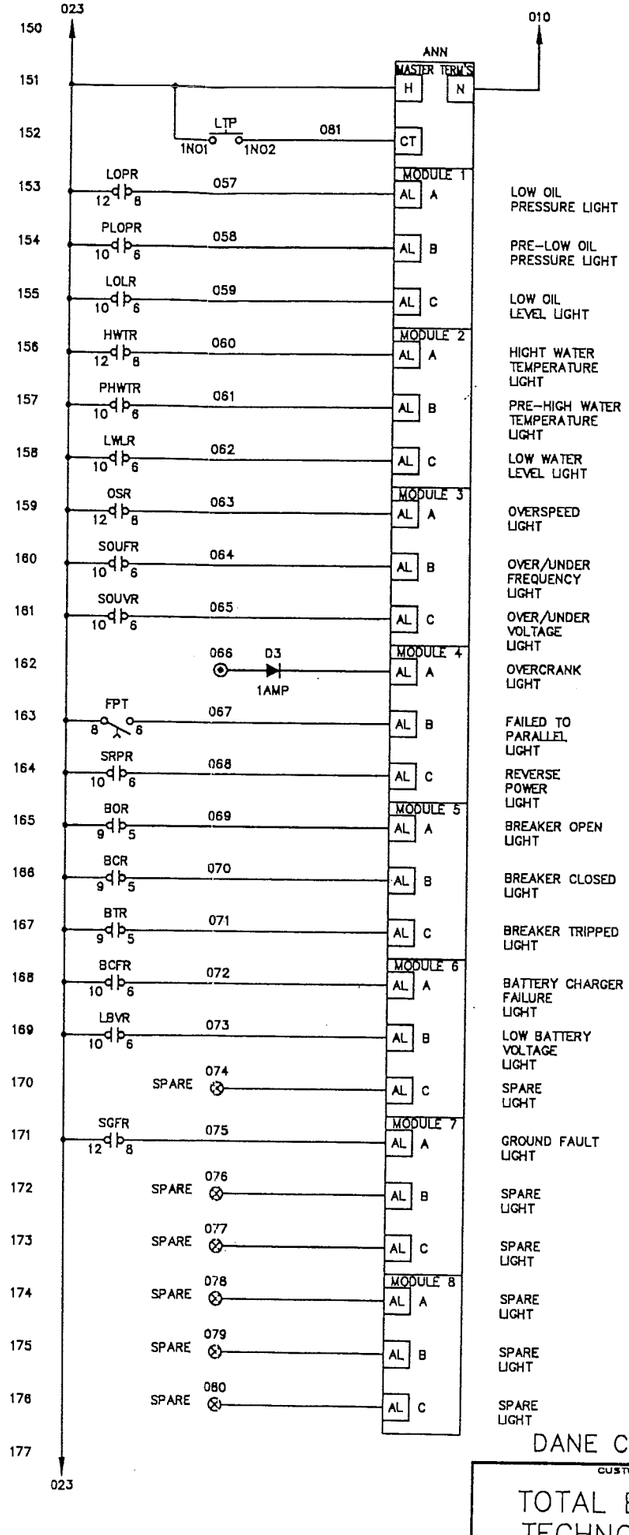
LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	022795			
DR'N AJL	CK'D			
APVD		1) AS BUILT	AJL	042195

TITLE: GENERATOR SWITCHBOARD DC SCHEMATIC – SEC 3 (GENERATOR#1)

NO. 952-0148-04 SHT 3 OF 4





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8) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (TB4)
9) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
10) CUSTOMER ENGINE TERMINAL BLOCK (ETB)
11) CUSTOMER WIRING
12) CUSTOMER CABLING
13) CUSTOMER SUPPLIED EQUIPMENT
14) LAST WIRE # USED -
DC CONTROL CIRCUIT 094
AC CONTROL CIRCUIT
AC C.T. CIRCUIT
AC INSTRUMENT CIRCUIT
AC REGULATOR CIRCUIT
48VDC CONTROL CIRCUIT
125VDC CONTROL CIRCUIT

DANE COUNTY

CUSTOMER

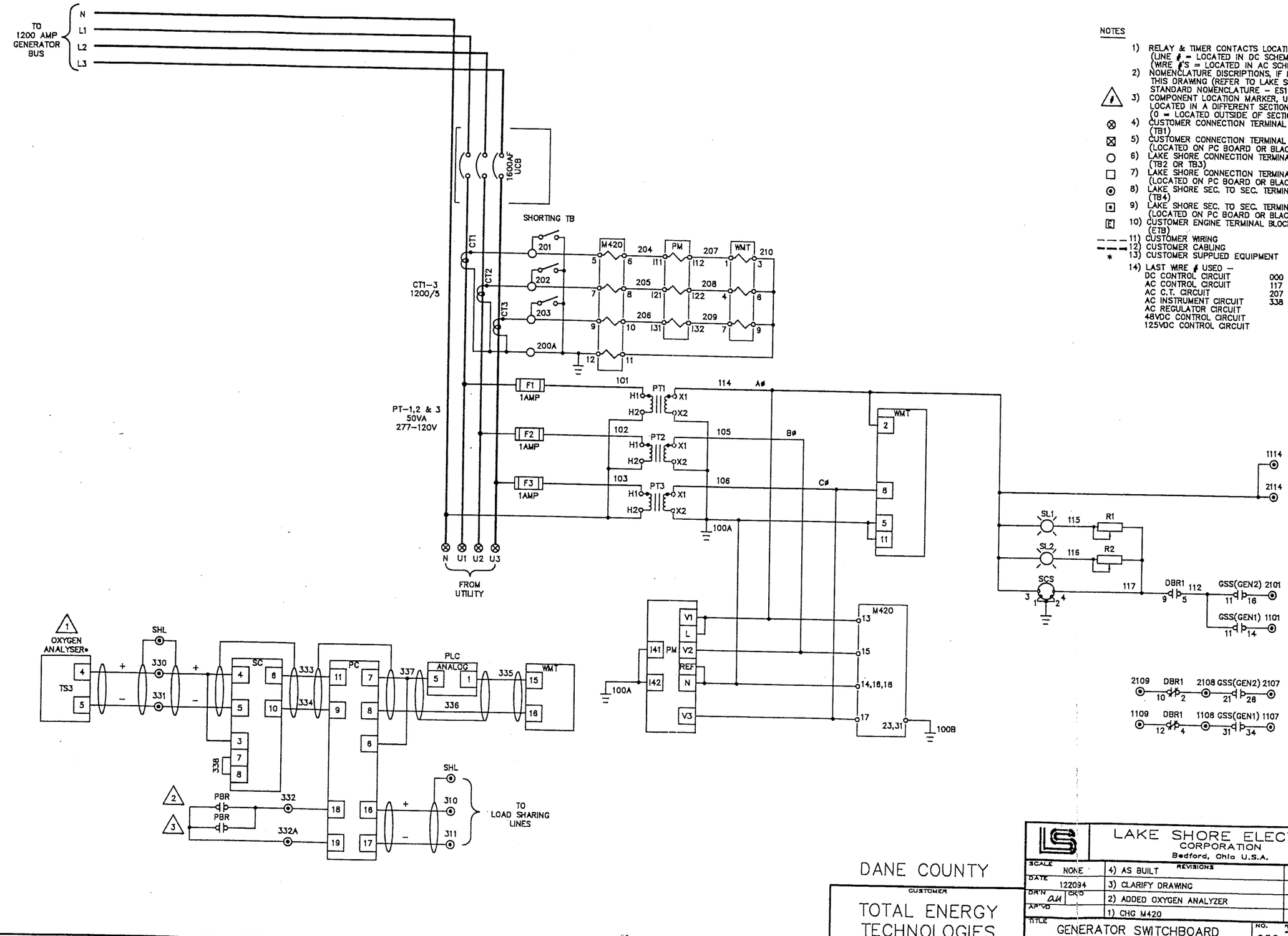
TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	022795			
DR'N AJL	CK'D			
APVD		1) AS BUILT	AJL	042195

TITLE: GENERATOR SWITCHBOARD DC SCHEMATIC - SEC 3 (GENERATOR #1)

NO. 952-0148-04 SHT 4 OF 4



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9) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
10) CUSTOMER ENGINE TERMINAL BLOCK (ETB)
11) CUSTOMER WIRING
12) CUSTOMER CABLING
13) CUSTOMER SUPPLIED EQUIPMENT
14) LAST WIRE # USED –

DC CONTROL CIRCUIT	000
AC CONTROL CIRCUIT	117
AC C.T. CIRCUIT	207
AC INSTRUMENT CIRCUIT	338
AC REGULATOR CIRCUIT	
48VDC CONTROL CIRCUIT	
125VDC CONTROL CIRCUIT	

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

REVISIONS	BY	DATE
4) AS BUILT	AJL	042195
3) CLARIFY DRAWING	AJL	022795
2) ADDED OXYGEN ANALYZER	DJA	021695
1) CHG M420	DJA	020295

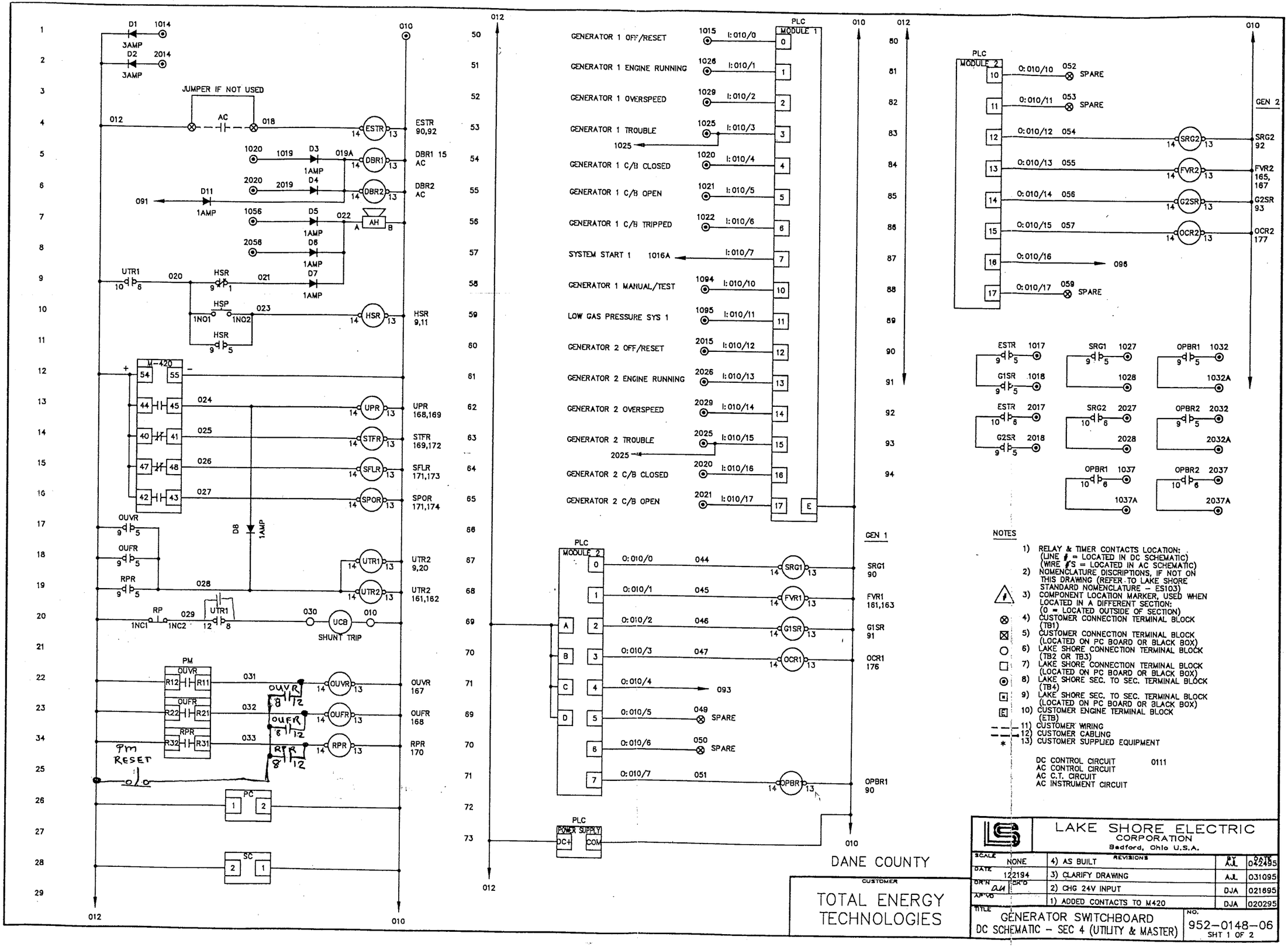
SCALE NONE
DATE 122094
DR'N aa CK'D
APP'D

CUSTOMER
DANE COUNTY

TOTAL ENERGY TECHNOLOGIES

TITLE
GENERATOR SWITCHBOARD
AC SCHEMATIC – SEC 4 (UTILITY & MASTER)

NO. 1 of 2
952-0148-05



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9) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
10) CUSTOMER ENGINE TERMINAL BLOCK (ETB)
11) CUSTOMER WIRING
12) CUSTOMER CABLING
13) CUSTOMER SUPPLIED EQUIPMENT

DC CONTROL CIRCUIT 0111
AC CONTROL CIRCUIT
AC C.T. CIRCUIT
AC INSTRUMENT CIRCUIT

DANE COUNTY

CUSTOMER
TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE NONE	REVISIONS		BY	DATE
DATE 122194	4) AS BUILT		AJL	042495
DR'N DM CR'D	3) CLARIFY DRAWING		AJL	031095
APV'D	2) CHG 24V INPUT		DJA	021895
	1) ADDED CONTACTS TO M420		DJA	020295

TITLE: GENERATOR SWITCHBOARD DC SCHEMATIC – SEC 4 (UTILITY & MASTER)

NO. 952-0148-06 SHT 1 OF 2

012

PLC MODULE 3

100	GENERATOR 2 C/B TRIPPED	2022	I:011/0	0
101	SYSTEM START 2	2016A	I:011/1	1
102	GENERATOR 2 MANUAL/TEST	2094	I:011/2	2
103	LOW GAS PRESSURE SYSTEM 2	2095	I:011/3	3
104	SPARE	063	I:011/4	4
105	SPARE	064	I:011/5	5
106	SPARE	065	I:011/6	6
107	SPARE	066	I:011/7	7
108	SPARE	067	I:011/10	10
109	SPARE	068	I:011/11	11
110	SPARE	069	I:011/12	12
111	SPARE	070	I:011/13	13
112	SPARE	071	I:011/14	14
113	SPARE	072	I:011/15	15
114	SPARE	073	I:011/16	16
115	SPARE	074	I:011/17	17
116				E

PLC MODULE 4

117	0	O:011/0	075 SPARE
118	1	O:011/1	076 SPARE
119	2	O:011/2	077 SPARE
120	3	O:011/3	078 SPARE
121	4	O:011/4	0103
122	5	O:011/5	080 SPARE
123	6	O:011/6	081 SPARE
124	7	O:011/7	082 SPARE

A, B, C, D

GEN 2 — 14 OPBR2 13 — OPBR2 93

012

010

012

PLC MODULE 4

150	10	O:011/10	083 SPARE
151	11	O:011/11	084 SPARE
152	12	O:011/12	085 SPARE
153	13	O:011/13	086 SPARE
154	14	O:011/14	087 SPARE
155	15	O:011/15	088 SPARE
156	16	O:011/16	089 SPARE
157	17	O:011/17	090 SPARE

010

ANN MASTER TERM'S H N

LTP 1NO1 1NO2 090A → CT

012 UCB(AUX1) 091 → MODULE 1 AL A

UCB(AUX1) 092 → AL B

093 → AL C

OUVR 10 6 — 094 → MODULE 2 AL A

OUFR 10 6 — 095 → AL B

096 → AL C

RPR 10 6 — 097 → MODULE 3 AL A

UPR 10 6 — 098 → AL B

STFR 10 6 — 099 → AL C

SFLR 10 6 — 0101 → MODULE 4 AL A

SPOR 10 6 — 0102 → AL B

0103 → AL C

OCR1 9 5 — D9 — 1AMP — 1025 — 1066

OCR2 9 5 — D10 — 1AMP — 2025 — 2066

UTILITY BREAKER CLOSED LIGHT	1101 UTR2 1113
UTILITY BREAKER OPEN LIGHT	2101 UTR2 2113
GENERATOR 1 FAULT	1016 UCB(AUX2) 1016A → 1016A
UTILITY OVER/UNDER VOLTAGE LIGHT	2016 UCB(AUX3) 2016A → 2016A
UTILITY OVER/UNDER FREQUENCY LIGHT	UPR 0104 → 0105
GENERATOR 2 FAULT	SFLR 0108 → 0109
UTILITY REVERSE POWER LIGHT	FVR1 1023 → 1031
UTILITY PROTECTIVE RELAY LIGHT	FVR1 1050 → 1051
UTILITY PROTECTIVE RELAY SELF TEST FAIL LIGHT	FVR2 2023 → 2031
UTILITY PROTECTIVE RELAY VT FUSE LOSS LIGHT	FVR2 2050 → 2051
UTILITY PROTECTIVE RELAY POWER OK LIGHT	STFR 0106 → 0107
HIGH OXYGEN LEVEL MODE	SPOR 0110 → 0111

DANE COUNTY

CUSTOMER

TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	122194	3) AS BUILT	AJL	042495
DR'N	DJA / CK'D	2) CLARIFY DRAWING	AJL	031095
APV'D		1) ADDED LIGHTS	DJA	020295

TITLE: GENERATOR SWITCHBOARD DC SCHEMATIC - SEC 4 (UTILITY & MASTER)

NO. 952-0148-06 SHT. 2 OF 2

GENERATOR CONTROL PANEL – SECTIONS 2 & 3 (GENERATOR)
(CUSTOMER CONNECTIONS)
REF DWG'S – #952-0148-03 & 04, SHEETS 1&2

TB1 DETAIL

010 011 012 013 023 026 027 028 029 030 031 032 033 034 037 038 039 040 044 053 (GEN 2 ONLY) 074 076 (GEN 1 ONLY) 077 078 079 080 085 086 087 320 321 SHL 328 329 SHL 401 402 403 404 405 406

SPARE ANNUNCIATOR INPUTS

GENERATOR CONTROL PANEL – SECTIONS 1 (GAS PROCESSING)
(CUSTOMER CONNECTIONS)
REF DWG'S – #952-0148-13, SHEETS 1&2

TB1: 187 188 189 190 191 192 193 194

SYSTEM 1: 187 188 191 192

SYSTEM 2: 189 190 193 194

UTILITY & MASTER CONTROL PANEL – SECTION 4
(CUSTOMER CONNECTIONS)
REF DWG'S – #952-0148-06, SHEETS 1&2

TB1 DETAIL

012 018 049 050 052 053 053 059 063 064 065 066 067 068 069 070 071 072 073 074 075 077 078 080 081 082 083 084 085 086 087 088 089 090 0104 0105 0106 0107 0108 0109 0110 0111

SPARE PLC OUTPUTS
SPARE PLC INPUTS
SPARE PLC OUTPUTS
SPARE ANNUNCIATOR INPUTS

AC

401 402 403 404 405 406

GENERATOR TERMINAL BLOCK

011 013 012 053 026 030 032 029 031 037 038 040 044 027 028 010 039 085 086 087 033 034 SHL 320 321 SHL 328 329

ENGINE TERMINAL BLOCK: 1 X X X 2 3 4 5 6 7 8 9 11 12 14 18 19 20 X 21 24 25 26 28 30 X 22 23 40 41 44 45

TO CRANKCASE BLOWER

ACTUATOR

MPU

ESS 2 3 4 5 6+

CB5 CB2 CB1 SMMS PS SM AMM ALT

BATTERY 24VDC

ESP HI/LO IDLE

ESS(CT) WTS OPS1 ESS(OS) SR2 SR1 LWLAS LWLAC ESP SR SMMS QSOV SR1 SR2 LOLS CB7 MAGNETO G LOPAS HWTAS

OPSU WTSU

MPU

DANE COUNTY

CUSTOMER
TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	122294	3) AS BUILT	AJL	042495
DR'N	TJF	2) ADDED GAS RADIATOR	DJA	021895
APP'VD		1) ADDED GAS BLOWER	DJA	011795

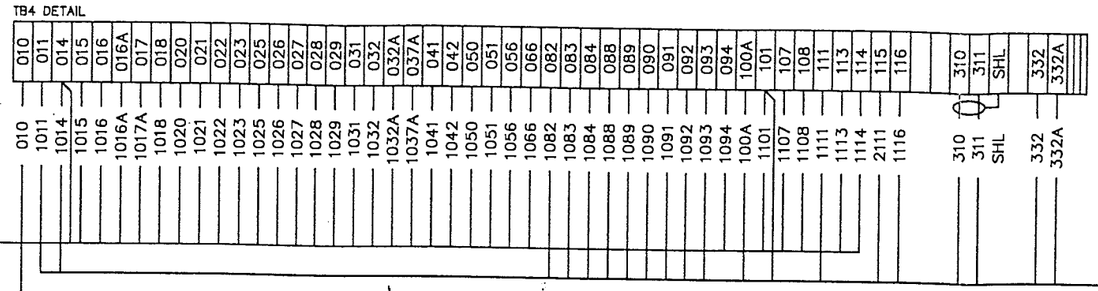
TITLE: GENERATOR SWITCHBOARD CUSTOMER CONNECTIONS

NO. 952-0148-07

1 of 1

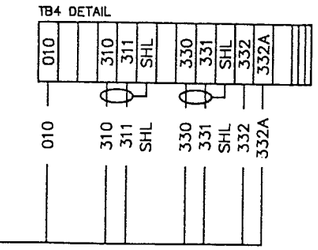
GENERATOR CONTROL PANEL – SECTION 3 (GENERATOR 1)
(INTERCONNECTIONS)
REF DWG'S – #952–0148–03 & 04, SHEETS 1&2

TB4 DETAIL

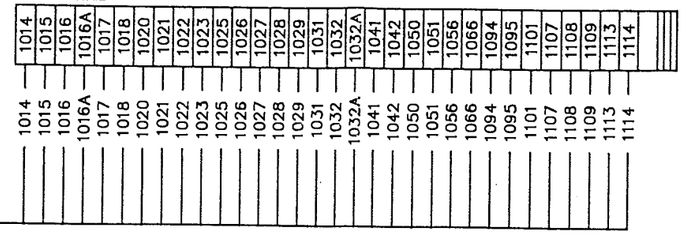


UTILITY & MASTER CONTROL PANEL – SECTION 4
(INTERCONNECTIONS)
REF DWG'S – #952–0148–06, SHEETS 1&2

TB4 DETAIL

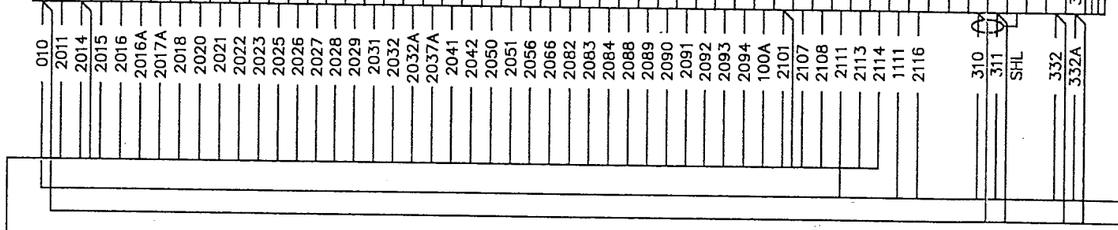


TB4–1 DETAIL

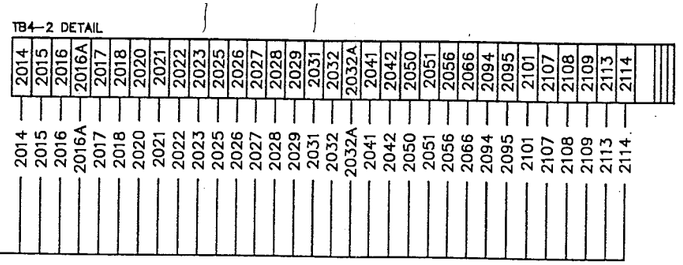


GENERATOR CONTROL PANEL – SECTION 2 (GENERATOR 2)
(INTERCONNECTIONS)
REF DWG'S – #952–0148–03 & 04, SHEETS 1&2

TB4 DETAIL

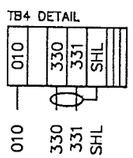


TB4–2 DETAIL

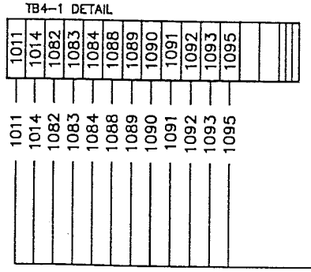


GENERATOR CONTROL PANEL – SECTION 1 (GAS PROCESSING)
(INTERCONNECTIONS)
REF DWG'S – #952–0148–13, SHEETS 1&2

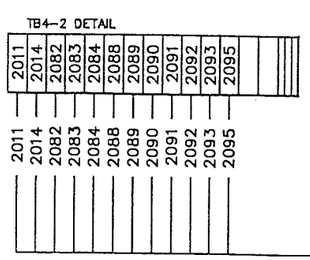
TB4 DETAIL



TB4–1 DETAIL



TB4–2 DETAIL



DANE COUNTY
CUSTOMER

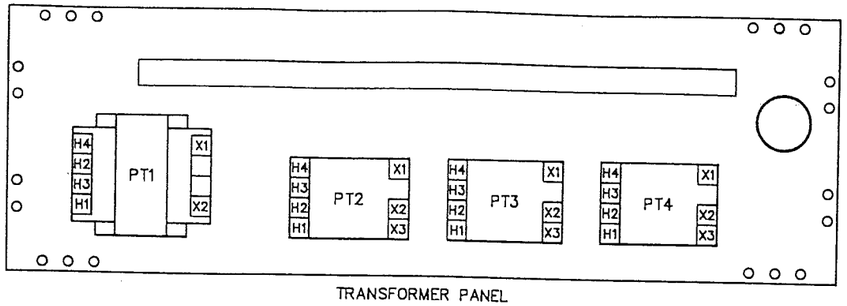
TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

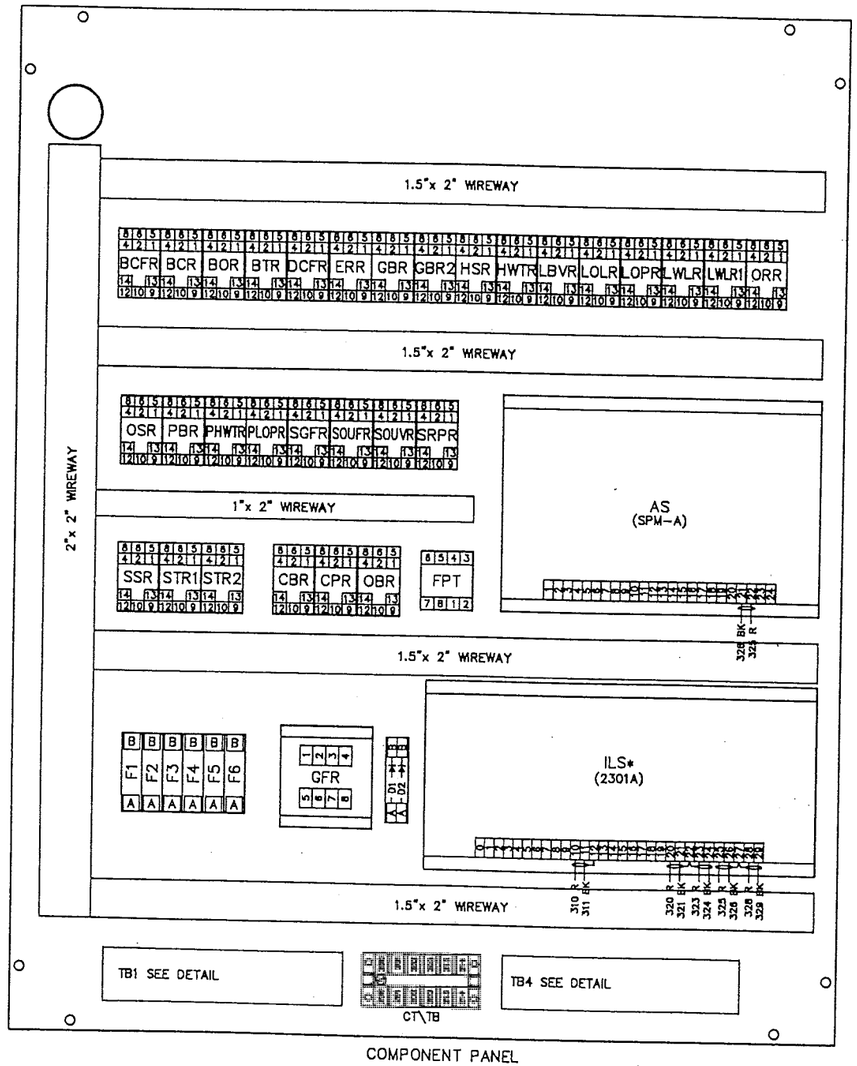
SCALE	NONE	REVISIONS	BY	DATE
DATE	122294	3) CLARIFY DRAWING	AJL	042495
DR'N	DJA CK'D	2) REVISED INTERCONNECTIONS	AJL	022895
APP'VD		1) ADDED GAS PROCESSING	DJA	021695

TITLE: GENERATOR SWITCHBOARD INTERCONNECTIONS

NO. 952–0148–08
2 of 2



TRANSFORMER PANEL

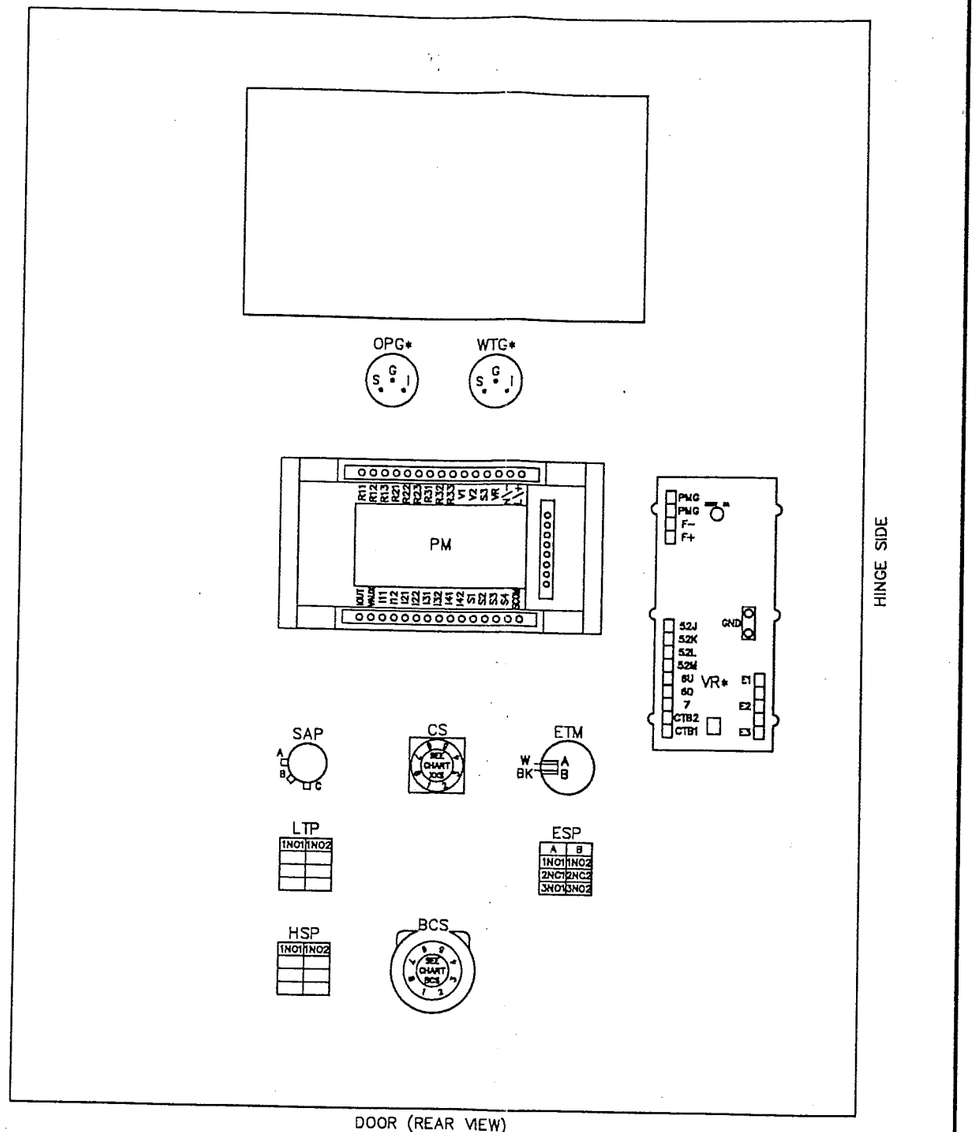


COMPONENT PANEL

NOTE: LWLR1 IN GENERATOR SECTION 2 ONLY.

TB1 DETAIL (BREAKER TB'S)

010	014	014	020	021	022	025	AUX3	AUX3	AUX3	100B	122	123	124	125	126



DOOR (REAR VIEW)

TB1 DETAIL

010	011	012	013	023	026	027	028	029	030	031	032	033	034	037	038	039	040	041	042	044	053	074	076	077	078	079	080	085	086	087	320	321	SHL	328	329	SHL	401	402	403	404	405	406

TB4 DETAIL

010	011	014	015	016	016A	017	018	020	021	022	023	025	026	027	028	029	031	032	032A	037A	050	051	056	066	082	083	084	088	089	090	091	092	093	094	100A	101	107	108	111	113	114	115	116	310	311	SHL	332	332A

5) CLARIFY DRAWING AJL 042495

DANE COUNTY

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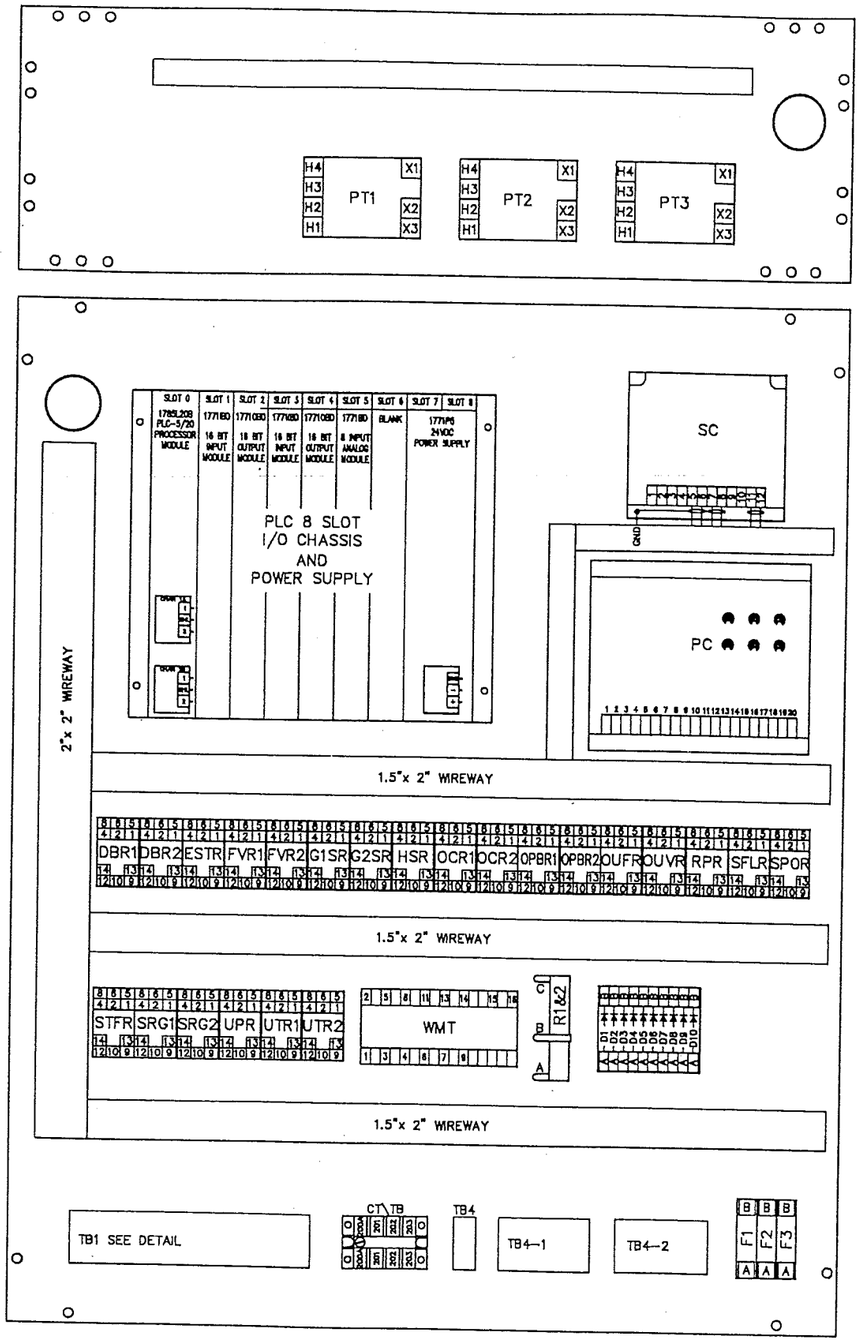
TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

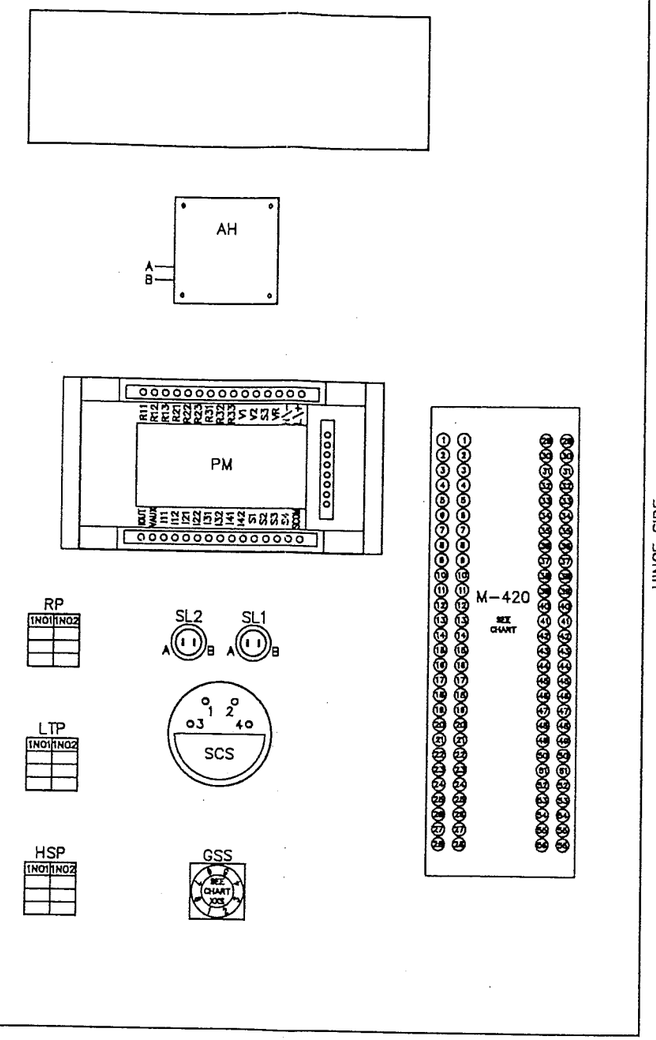
SCALE	.25=1	REVISIONS	BY	DATE
DATE	122294	4) ADDED TB'S, DPT SHORTING TB	AJL	032995
DR'N	AJL CK'D	3) ADD GBR, CLARIFY PART LAYOUT	AJL	022795
APV'D		2) ADDED VR	DJA	021695
		1) ADDED CT/TB	DJA	020295

TITLE: GENERATOR SWITCHBOARD PART LAYOUT – SEC. 2&3 (GEN.)

NO. 952-0148-09 SHT 1 OF 4



COMPONENT PANEL



DOOR (REAR VIEW)

TB1 DETAIL

012	018	048	049	050	052	053	058	059	063	064	065	066	067	068	069	070	071	072	073	074	075	077	078	079	080	081	082	083	084	085	086	087	088	089	090	093	096	0103	0104	0105	0106	0107	0108	0109	0110	0111

TB4 DETAIL

010		310	311	SHL	330	331	SHL	332	332A	SHL

TB4-1 DETAIL

1014	1015	1016	1016A	1017	1018	1020	1021	1022	1023	1025	1026	1027	1028	1029	1031	1032	1032A	1050	1051	1056	1066	1094	1095	1101	1107	1108	1109	1113	1114

TB4-2 DETAIL

2014	2015	2016	2016A	2017	2018	2020	2021	2022	2023	2025	2026	2027	2028	2029	2031	2032	2032A	2050	2051	2056	2066	2094	2095	2101	2107	2108	2109	2113	2114

TB2 DETAIL (BREAKER TB'S)

010	012	030	091	092	AUX2	AUX2	AUX2	AUX3	AUX3	AUX3	AUX3	AUX4	AUX4	AUX4

DANE COUNTY

CUSTOMER

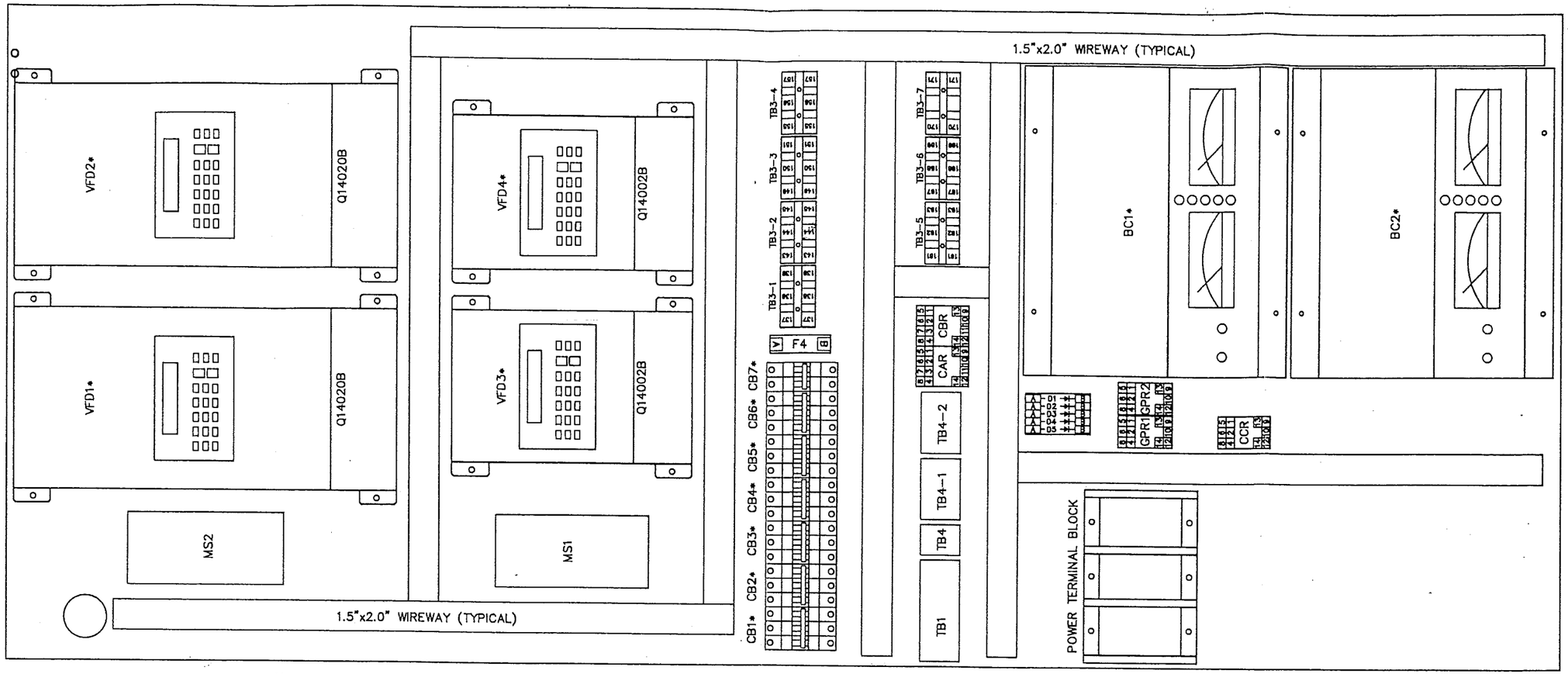
TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

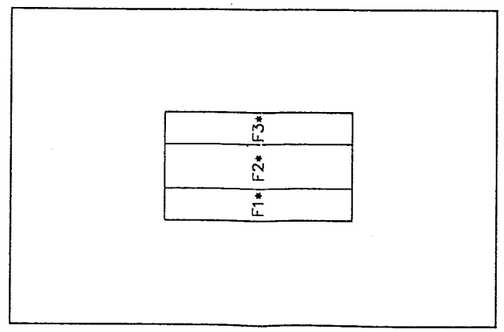
SCALE	.25=1	REVISIONS	BY	DATE
DATE	122294	4) AS BUILT	AJL	042495
DR'N	CR'D	3) CLARIFY PART LAYOUT	AJL	022795
		2) CHG TB4	DJA	021695
APV'D		1) ADDED RELAYS	DJA	020295

TITLE: GENERATOR SWITCHBOARD PART LAYOUT – SEC. 4 (UTILITY & MASTER)

NO. 952-0148-09 SHT 2 OF 4



COMPONENT PANEL



FUSE BLOCK PANEL

TB1

187	188	SHL	189	190	SHL	191	192	SHL	193	194	SHL

TB4 DETAIL

010	330	331	SHL

TB4-1 DETAIL

1011	1014	1082	1083	1084	1088	1089	1090	1091	1092	1093

TB4-2 DETAIL

2011	2014	2082	2083	2084	2088	2089	2090	2091	2092	2093

SYSTEM 1

187	188	191	192

SYSTEM 2

189	190	193	194

DANE COUNTY

CUSTOMER

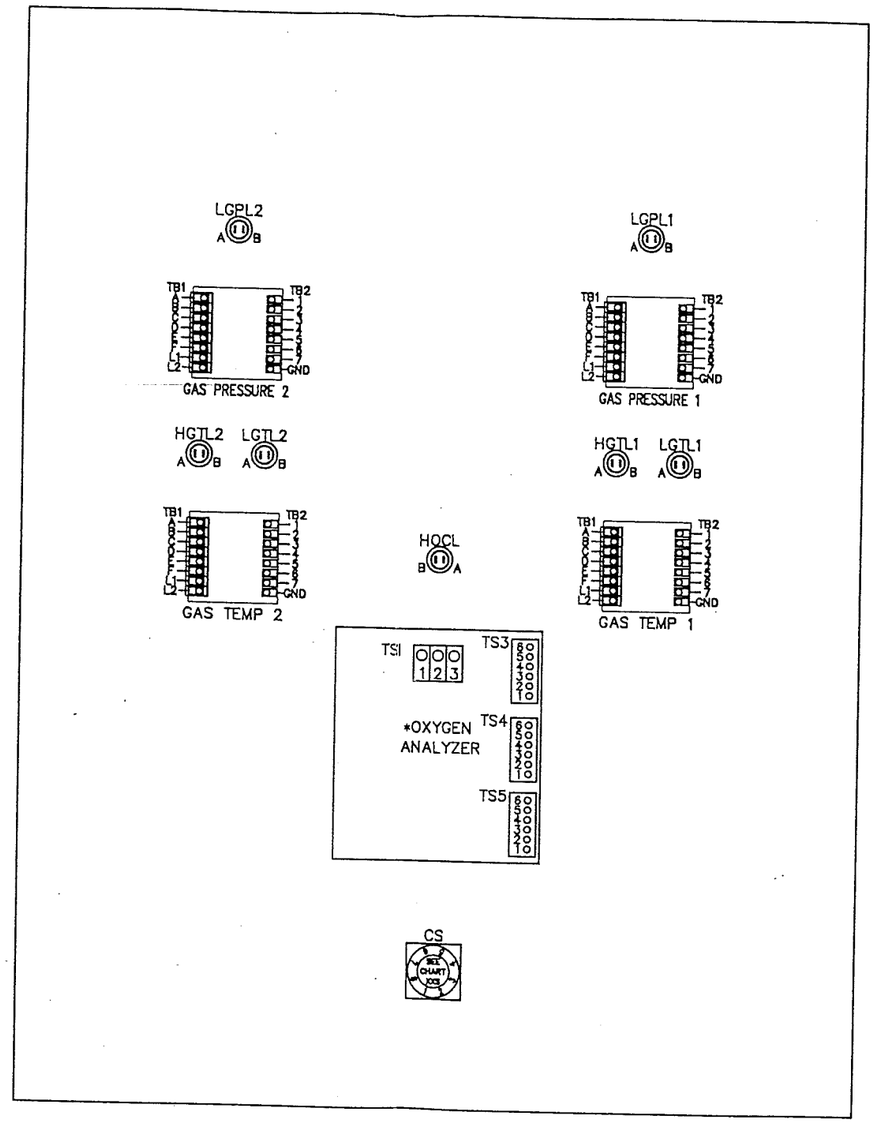
TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	.25=1	REVISIONS	BY	DATE
DATE	021695	3) REVISED PART LAYOUT	AJL	042495
DR'N AH	CK'D	2) PART LAYOUT AS BUILT	AJL	032995
APP'D		1) REVISED PART LAYOUT	AJL	030195

TITLE: GENERATOR SWITCHBOARD PART LAYOUT - SEC. 1 (GAS PROCESSING)

NO. 952-0148-09 SHT 3 OF 4



DANE COUNTY

CUSTOMER

TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	.25=1	REVISIONS	BY	DATE
DATE	021795			
DWN AM	CK'D			
APVD		1) REVISED PART LAYOUT	AJL	022895

TITLE: GENERATOR SWITCHBOARD PART LAYOUT – SEC. 1 (GAS PROCESSING)

NO. 952-0148-09
SHT 4 OF 4

SWITCHBOARD

SYM	DESCRIPTION
ABR	AUXILIARY BREAKER RELAY
AC	ACTUATING CONTACT
AH	ALARM HORN
AHL	ALARM HORN LIGHT
AHR	ALARM HORN RELAY
AM	AMMETER
AMS	AMMETER SWITCH
APL	ALTERNATE POWER ON LIGHT
APR	ALTERNATE POWER ON RELAY
AS	AUTOMATIC SYNCHRONIZER
ASR	AUTOMATIC SYNCHRONIZER RELAY
ATS	AUTOMATIC TRANSFER SWITCH
AUX	CIRCUIT BREAKER AUX SWITCH
AVS	AMMETER/VOLTMETER SWITCH
B	BLUE
BA	BELL ALARM
BC	BATTERY CHARGER
BCFL	BATTERY CHARGER FAILURE LIGHT
BCFR	BATTERY CHARGER FAILURE RELAY
BCL	BREAKER CLOSED LIGHT
BCM	BACKUP CONTROL MODULE
BCR	BREAKER CLOSED RELAY
BCS	BREAKER CONTROL SWITCH
BCVM	BATTERY CHARGER VOLTMETER
BK	BLACK
BOL	BREAKER OPEN LIGHT
BOR	BREAKER OPEN RELAY
BR	BROWN
BTL	BREAKER TRIP LIGHT
BTM	BEARING TEMP. MONITOR
BTMR	BEARING TEMP. MONITOR RELAY
BTMSS	BEARING TEMP. SELECTOR SWITCH
BTR	BREAKER TRIP RELAY
C	CAPACITOR
CB	CIRCUIT BREAKER
CBR	CLOSE BREAKER RELAY
CCT	CROSS CURRENT TRANSFORMER
CGR	CLOSE GENERATOR BREAKER RELAY
CLT	CRANK LENGTH TIMER
CNTR	COUNTER
CNTL	CONTROL
CPB	CRANK PUSHBUTTON
CPR	CONTROL POWER RELAY
CS	CONTROL SWITCH
CT	CURRENT TRANSFORMER
CTD	CAPACITOR TRIP DEVICE
CTR	CRANK TERMINATION RELAY
CUL	CURRENT LIGHT
CUR	CLLOSED UTILITY BREAKER RELAY
D	DIODE
DBR	DEAD BUS RELAY
DBT	DEAD BUS TIMER
DECS	DIGITAL EXCITATION CONTROL SYSTEM
DFL	DIFFERENTIAL FAULT LIGHT
DR	DIFFERENTIAL RELAY
DS	DISCONNECT SWITCH
ECR	ENGINE CRANK RELAY
EMT	ENGINE MAINTAIN TIMER
EPAL	EMERGENCY POWER AVAILABLE LIGHT
EPL	EMERGENCY POWER ON LIGHT
EPR	EMERGENCY POWER ON RELAY
ERL	ENGINE RUN LIGHT
ERR	ENGINE RUN RELAY
ESL	EMERGENCY STOP LIGHT
ESP	EMERGENCY STOP PUSHBUTTON
ESPP	ENGINE STOP PUSHBUTTON
ESPR	ENGINE STOP RELAY
ESR	EMERGENCY STOP RELAY
ESTP	ENGINE START PUSHBUTTON
ESTR	ENGINE START RELAY
ETM	ELAPSED TIME METER
F	FUSE
FBR	FUSE BLOWN RELAY
FES	FLOAT EQUALIZER SWITCH
FLR	FLASHING RELAY
FM	FREQUENCY METER
FPG	FUEL PRESSURE GAUGE
FPL	FAIL TO PARALLEL LIGHT
FPT	FAIL TO PARALLEL TIMER
FR	FREQUENCY RELAY
FVR	FUEL VALVE RELAY
G#SR	GENERATOR # STOP RELAY
GCB	GENERATOR CIRCUIT BREAKER
GCBR	GENERATOR CIRCUIT BREAKER RELAY
GDCT	GENERATOR DIFFERENTIAL CURRENT TRANSFORMER
GFCT	GROUND FAULT CURRENT TRANSFORMER
GFL	GROUND FAULT LIGHT
GFP	GROUND FAULT RESET (PUSHBUTTON)
GFR	GROUND FAULT RELAY
GFS	GROUND FAULT SENSOR

SWITCHBOARD

SYM	DESCRIPTION
GOFL	GENERATOR OFF LIGHT
GOL	GENERATOR ON LIGHT
GOLL	GENERATOR ON LINE LIGHT
GPBR	GENERATOR PHASE BALANCE RELAY
GPLL	GLOW PLUG LIGHT
GPLR	GLOW PLUG RELAY
GPLS	GLOW PLUG SWITCH
GPLT	GLOW PLUG TIMER
GPR	GENERATOR PREFERRED RELAY
GPS	GENERATOR PREFERRED SWITCH
GRL	GENERATOR RUNNING LIGHT
GSS	GENERATOR SYNCHRONIZING SWITCH
GTL	GENERATOR TROUBLE LIGHT
GVB	GENERATOR VACUUM BREAKER
H	HEATER
HBTL	HIGH BEARING TEMPERATURE LIGHT
HBTR	HIGH BEARING TEMPERATURE RELAY
HBVL	HIGH BATTERY VOLTAGE LIGHT
HBVR	HIGH BATTERY VOLTAGE RELAY
HBVT	HIGH BATTERY VOLTAGE TIMER
HFLL	HIGH FUEL LEVEL LIGHT
HFLR	HIGH FUEL LEVEL RELAY
HGWTL	HIGH GEN. WINDING TEMPERATURE LIGHT
HGWTR	HIGH GEN. WINDING TEMPERATURE RELAY
HOTL	HIGH OIL TEMPERATURE LIGHT
HOTR	HIGH OIL TEMPERATURE RELAY
HS	HEATER SWITCH
HSL	HORN SILENCE LIGHT
HSP	HORN SILENCE PUSHBUTTON
HSR	HORN SILENCE RELAY
HSS	HORN SILENCE SWITCH
HWTL	HIGH WATER TEMPERATURE LIGHT
HWTR	HIGH WATER TEMPERATURE RELAY
ILS	ISOCHRONOUS LOAD SHARING MODULE
K	CONTROL RELAY
L	INDUCTOR
LAR	LOAD ADD RELAY
LBD	LAMP BOARD
LBS	LOAD BANK SWITCH
LBVL	LOW BATTERY VOLTAGE LIGHT
LBVR	LOW BATTERY VOLTAGE RELAY
LBVT	LOW BATTERY VOLTAGE TIMER
LDC	LOAD DEMAND CONTROLLER
LDR	LOAD DEMAND TIMER RELAY
LDT	LOAD DEMAND TIMER
LER	LOSS OF EXCITATION RELAY
LFLL	LOW FUEL LEVEL LIGHT
LFLR	LOW FUEL LEVEL RELAY
LL1L	LOW LEVEL 1 LIGHT
LL1R	LOW LEVEL 1 RELAY
LL2L	LOW LEVEL 2 LIGHT
LL2R	LOW LEVEL 2 RELAY
LOLL	LOW OIL LEVEL LIGHT
LOLR	LOW OIL LEVEL RELAY
LOPL	LOW OIL PRESSURE LIGHT
LOPR	LOW OIL PRESSURE RELAY
LSL	LOAD SHED LIGHT
LSR	LOAD SHED RELAY
LSTL	LOW STORAGE TANK LIGHT
LSTR	LOW STORAGE TANK RELAY
LTP	LAMP TEST PUSHBUTTON
LWLL	LOW WATER LEVEL LIGHT
LWLR	LOW WATER LEVEL RELAY
LWPL	LOW WATER PRESSURE LIGHT
LWPR	LOW WATER PRESSURE RELAY
LWTL	LOW WATER TEMPERATURE LIGHT
LWTR	LOW WATER TEMPERATURE RELAY
MCS	MASTER CONTROL SWITCH
MMR	MANUAL MODE RELAY
MO	MOTOR OPERATOR
MVC	MANUAL VOLTAGE CONTROL
MVL	MANUAL VOLTAGE LIGHT
MVR	MANUAL VOLTAGE RELAY
N	NEUTRAL
NAL	NOT IN AUTO LIGHT
NAR	NOT IN AUTO RELAY
NCT	NEUTRAL CURRENT TRANSFORMER
NGR	NEUTRAL GROUNDING RESISTOR
NPAL	NORMAL POWER AVAILABLE LIGHT
NPL	NORMAL POWER ON LIGHT
NPR	NORMAL POWER ON RELAY
O	ORANGE
OBR	OPEN BREAKER RELAY
OCL	OVERCRANK LIGHT
OCR	OVERCRANK RELAY
OCUL	OVERCURRENT LIGHT
OCUR	OVERCURRENT RELAY
OFL	OVERFREQUENCY LIGHT
OGR	OPEN GENERATOR BREAKER RELAY
OPBL	OIL PRESSURE BYPASS LIGHT

SWITCHBOARD

SYM	DESCRIPTION
OPBR	OIL PRESSURE BYPASS RELAY
OPBT	OIL PRESSURE BYPASS TIMER
OPG	OIL PRESSURE GAUGE
ORPB	OVERRIDE PUSHBUTTON (ATS)
ORR	OFF/RESET RELAY
OSL	OVERSPEED LIGHT
OSR	OVERSPEED RELAY
SUFR	SLAVE UNDERFREQUENCY RELAY
SUVR	SLAVE UNDERVOLTAGE RELAY
OUR	OPEN UTILITY BREAKER RELAY
P	POTENTIOMETER
PAL	PRE-ALARM LIGHT
PAR	PRE-ALARM RELAY
PBR	PARALLEL BUS RELAY
PBT	PARALLEL BUS TIMER
PC	PROCESS CONTROL
PFM	POWER FACTOR METER
PFR	PHASE FAILURE RELAY (U/VOL)
PFRO	PHASE FAILURE RELAY (O/VOL)
PHWTL	PRE-HIGH WATER TEMPERATURE LIGHT
PHWTR	PRE-HIGH WATER TEMPERATURE RELAY
PLC	PROGRAMABLE LOGIC CONTROLLER
PLOPL	PRE-LOW OIL PRESSURE LIGHT
PLOPR	PRE-LOW OIL PRESSURE RELAY
PLS	PANEL LIGHT SWITCH
PLWLL	PRE-LOW WATER LEVEL LIGHT
PLWLR	PRE-LOW WATER LEVEL RELAY
PLWTL	PRE-LOW WATER TEMP. LIGHT
PLWTR	PRE-LOW WATER TEMP. RELAY
PM	POWER MONITOR
PR	PILOT RELAY
PSR	PHASE SEQUENCE RELAY
PT	POTENTIAL TRANSFORMER
PVBL	PRE-VIBRATION LIGHT
PVBR	PRE-VIBRATION RELAY
Q	SOLID STATE SWITCH
R	RESISTOR
RB	RECTIFIER BRIDGE
RBD	RELAY BOARD
REC	RECEPTACLE
RIR	RECRANK INHIBIT RELAY
RP	RESET PUSHBUTTON
RPL	REVERSE POWER LIGHT
RPR	REVERSE POWER RELAY
RPT	REVERSE POWER TIMER
RR	RESET RELAY
RST	RACK SOLENOID TIMER
RTSR	READY-TO-SYNCRONIZE RELAY
S	SWITCH
SAP	SPEED ADJUST POTENTIOMETER
SAR	SLAVE ACTUATING RELAY
SC	SIGNAL CONDITIONER
SCR	SYNCHRONIZING CHECK RELAY
SCS	SYNCHROSCOPE
SCUR	SLAVE CURRENT RELAY
SFLR	SLAVE FUSE LOSS RELAY
SGFR	SLAVE GROUND FAULT RELAY
SHWTR	SLAVE HIGH WATER TEMP. RELAY
SL	SYNC LIGHT
SLER	SLAVE LOSS OF EXCITATION RELAY
SLOPR	SLAVE LOW OIL PRESSURE RELAY
SLS	SYNC LIGHT SWITCH
SLSR	SLAVE LOAD SHED RELAY
SM	STARTMASTER
SOBR	SLAVE OPEN BREAKER RELAY
SOCR	SLAVE OVERCRANK RELAY
SOSR	SLAVE OVERSPEED RELAY
SOVR	SLAVE OVERVOLTAGE RELAY
SPBR	SLAVE PARALLEL BUS RELAY
SPFR	SLAVE POWER FAILURE RELAY
SPOR	SLAVE POWER OK RELAY
SRG#	START RELAY GENERATOR #
SRPR	SLAVE REVERSE POWER RELAY
SS	SELECTOR SWITCH
SSR	SYSTEM START RELAY
ST	SHUNT TRIP
STR	SYSTEM TROUBLE RELAY
STFR	SLAVE TEST FAIL RELAY
SUPR	SLAVE UTILITY PROTECTIVE RELAY
SUVR	SLAVE UNDERVOLTAGE RELAY
SYR	SYNCRONIZE RELAY
T	TRANSFORMER
TB	TERMINAL BLOCK
TM	TRANSFER MOTOR
TR	TROUBLE RELAY
UCB	UTILITY CIRCUIT BREAKER
UCBR	UTILITY CLOSED BREAKER RELAY
UOBR	UTILITY OPEN BREAKER RELAY
UPBR	UTILITY PHASE BALANCE RELAY
UPR	UTILITY PROTECTIVE RELAY

SWITCHBOARD

SYM	DESCRIPTION
UTR	UTILITY TROUBLE RELAY
UCB	UTILITY CIRCUIT BREAKER
UCUR	UNDERCURRENT RELAY
UCUT	UNDERCURRENT TIMER
UFL	UNDERFREQUENCY LIGHT
UFR	UNDERFREQUENCY RELAY
UFT	UNDERFREQUENCY TIMER
UVB	UTILITY VACUUM BREAKER
UVL	UNDERVOLTAGE LIGHT
UVR	UNDERVOLTAGE RELAY
UVT	UNDERVOLTAGE TIMER
V	VIOLET
VBL	VIBRATION LIGHT
VBM	VIBRATION MONITOR
VBR	VIBRATION RELAY
VCB	VACUUM CIRCUIT BREAKER
VCS	VOLTAGE CONTROL SWITCH
VM	VOLTMETER
VMS	VOLTMETER SWITCH
VMT	VOLTMETER TRANSDUCER
VR	VOLTAGE REGULATOR
VRM	VARMETER
VRMT	VARMETER TRANSDUCER
W	WHITE
WHM	WATTHOUR METER
WM	WATTMETER
WMT	WATTMETER TRANSDUCER
WTG	WATER TEMPERATURE GAUGE
WUT	WARM UP TIMER
Y	YELLOW
Z	ZENER DIODE

ENGINE

SYM	DESCRIPTION
ALT	ALTERNATOR
AMM	AMMETER
ASOS	AIR SHUT-OFF
ASSV	AIR START SOLENOID VALVE
AVS	ALTERNATOR VOLTAGE REGULATOR
AVRPS	ALTERNATOR VOLT. REG. PRES. SWITCH
B-	BATTERY NEGATIVE
B+	BATTERY POSITIVE
BATT	BATTERY
CB	CIRCUIT BREAKER
CM	CRANKING MOTOR
CMC	CRANKING MOTOR CONTACTOR
CT	CRANK TERMINATION
D	DIODE
DM	DIODE MODULE
DSS	DUAL SPEED SWITCH
EGA	ELECTRIC GOVERNOR ACTUATOR
EGC	ELECTRIC GOVERNOR CONTROL
ESS	ELECTRIC SPEED SWITCH
FOPS	FUEL OIL PRESSURE SWITCH
FSOS	FUEL SHUT-OFF SOLENOID
GM	GOVERNOR MOTOR
GOV	GOVERNOR
GP	GLOW PLUG
GSM	GOVERNOR SYNC. MOTOR
HCCPS	HIGH CRANK CASE PRESSURE SWITCH
HM	HOUR METER
HMMPU	HOUR METER MAGNETIC PICK-UP
HWTA	HIGH WATER TEMPERATURE ALARM
HWTS	HIGH WATER TEMPERATURE SWITCH
HVS	HIGH VIBRATION SWITCH

ENGINE

SYM	DESCRIPTION
LFLA	LOW FUEL LEVEL ALARM
LFLAS	LOW FUEL LEVEL ALARM SWITCH
LOLA	LOW OIL LEVEL ALARM
LOLAS	LOW OIL LEVEL ALARM SWITCH
LOPA	LOW OIL PRESSURE ALARM
LOPAS	LOW OIL PRESSURE ALARM SWITCH
LWLA	LOW WATER LEVEL ALARM
LWLAS	LOW WATER LEVEL ALARM SWITCH
LWTA	LOW WATER TEMPERATURE ALARM
LWTAS	LOW WATER TEMPERATURE ALARM SWITCH
MPU	MAGNETIC PICK-UP
OPG	OIL PRESSURE GAUGE
OPI	OIL PRESSURE INDICATOR
OPS	OIL PRESSURE SWITCH
OPSS	OIL PRESSURE STEP SWITCH
OPSU	OIL PRESSURE SENDING UNIT
OS	OVERSPEED
OSI	OVERSPEED INDICATOR
OSS	OVERSPEED SWITCH
PB	PUSHBUTTON
PP	PRELUBE PUMP
PPMS	PRELUBE PUMP MAGNETIC SWITCH
PPPS	PRELUBE PUMP PRESSURE SWITCH
PR	PRE-REGULATOR
PS	PINION SOLENOID
RES	RESISTOR
RLS	RAISE-LOWER SWITCH
RNS	REMOTE NORMAL SHUT-OFF SWITCH
RNSS	REMOTE NORMAL STOP SWITCH
RSAS	REMOTE STARTING AID SWITCH
RSC	REMOTE SPEED CONTROL
RSS	REMOTE START SWITCH
SA	STARTING AID
SAMS	STARTING AID MAGNETIC SWITCH
SAS	STARTING AID SWITCH
SASV	STARTING AID SOLENOID VALVE
SATS	STARTING AID TEMPERATURE SWITCH
SM	STARTING MOTOR
SMMS	STARTING MOTOR MAGNETIC SWITCH
SR	STARTER RELAY
SS	START SWITCH
SSMPU	SPEED SWITCH MAGNETIC PICK-UP
SSS	START-STOP SWITCH
TD	TIME DELAY
TM	TACHOMETER
TMMPU	TACHOMETER MAGNETIC PICK-UP
TMS	TACHOMETER
TS	TERMINAL STRIP
TSDV	THROTTLE SOLENOID DUMP VALVE
TSS	TACHOMETER SPEED SENSOR
WTG	WATER TEMPERATURE GAUGE
WTI	WATER TEMPERATURE INDICATOR
WTS	WATER TEMPERATURE SWITCH
WTSU	WATER TEMPERATURE SENDING UNIT

DANE COUNTY

CUSTOMER

TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

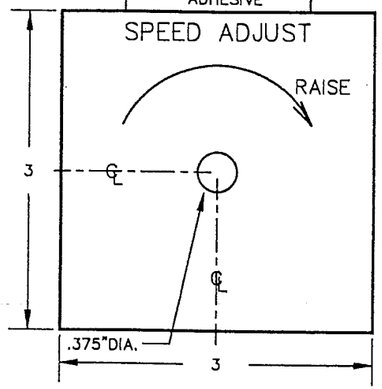
SCALE	NONE	REVISIONS	BY	DATE
DATE	122394			
DR'N	TLF	CK'D		
APP'VD		1) ADDED NOMENCLATURE	DJA	020295

TITLE: GENERATOR SWITCHBOARD NOMENCLATURE

NO. 952-0148-10

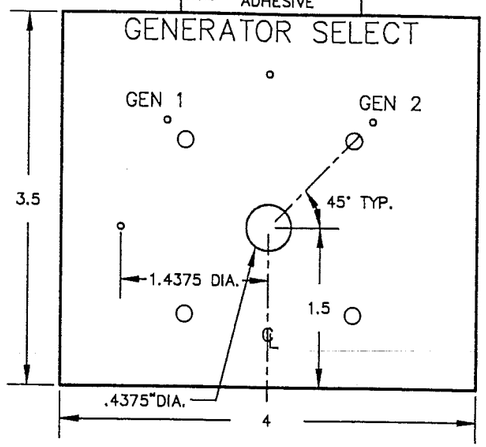
ITEM# 1 | QTY. 2
MAT. BLK/WHT/.063
MTG. ADHESIVE

SPEED ADJUST

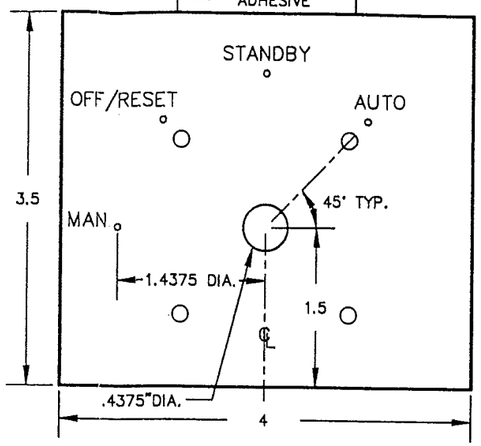


ITEM# 1 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE

GENERATOR SELECT



ITEM# 1 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE



ITEM# 5 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE

MASTER

2
6

ITEM# 6 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE

GENERATOR#1

2
6

ITEM# 7 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE

GENERATOR#2

2
6

ITEM# 8 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE

GCB-1

2
6

ITEM# 9 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE

GCB-2

2
6

ITEM# 10 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE

UCB

2
6

ITEM# 11 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE

SYNCHRONIZED WHEN DARK

1
2

ITEM# 12 | QTY. 3
MAT. BLK/WHT/.063
MTG. ADHESIVE

LAMP TEST

1
2

ITEM# 13 | QTY. 3
MAT. BLK/WHT/.063
MTG. ADHESIVE

HORN SILENCE

1
2

ITEM# 14 | QTY. 2
MAT. BLK/WHT/.063
MTG. ADHESIVE

EMERGENCY STOP

1
2

DANE COUNTY
CUSTOMER

TOTAL ENERGY TECHNOLOGIES

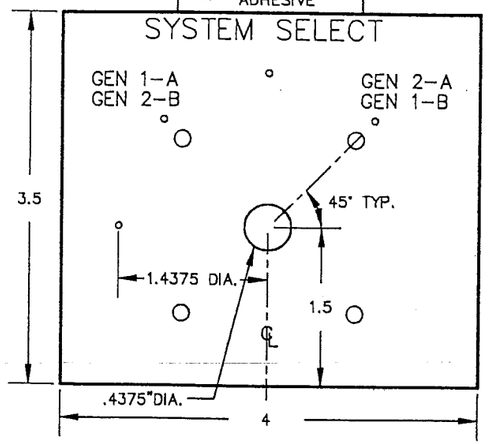
LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	122394			
DR'N TJF	CK'D	2) CHANGE QUANTITY	TJF	041095
APP'VD		1) DELETE BREAKER CONTROL	TJF	040595

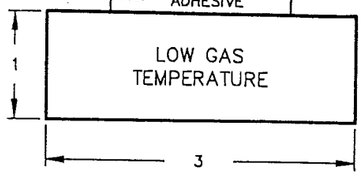
TITLE: GENERATOR SWITCHBOARD NAMEPLATES

NO. 952-0148-11
SHT 1 OF 2

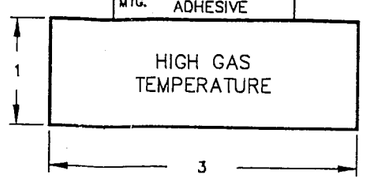
ITEM#15 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE



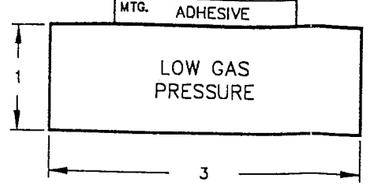
ITEM#16 | QTY. 2
MAT. BLK/WHT/.063
MTG. ADHESIVE



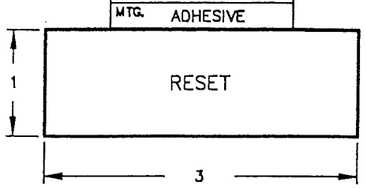
ITEM#17 | QTY. 2
MAT. BLK/WHT/.063
MTG. ADHESIVE



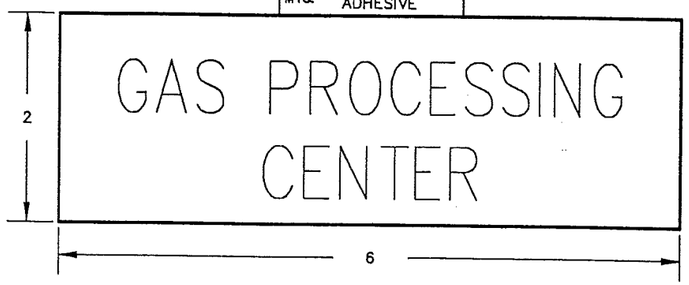
ITEM#18 | QTY. 2
MAT. BLK/WHT/.063
MTG. ADHESIVE



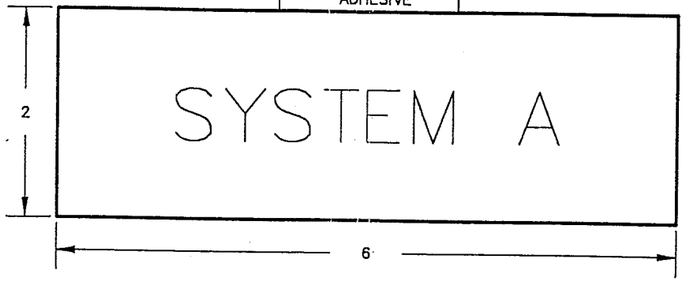
ITEM#18A | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE



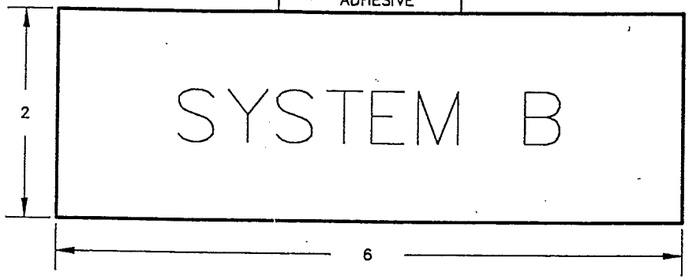
ITEM#19 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE



ITEM#20 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE



ITEM#21 | QTY. 1
MAT. BLK/WHT/.063
MTG. ADHESIVE



DANE COUNTY
CUSTOMER

TOTAL ENERGY
TECHNOLOGIES

LAKE SHORE ELECTRIC
CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	122394			
DR'N TJF	CK'D	2) CLARIFY	TJF	041095
APP'VD		1) SYSTEM SELECT NAMEPLATE	TJF	040595

TITLE: GENERATOR SWITCHBOARD NAMEPLATES

NO. 952-0148-11
SHT 2 OF 2

GENERATOR 1

0 — CS1(OFF):I:010/0 → N7:0/0 ORR1 — GEN 1 OFF/RESET RELAY

1 — SSR1(I:010/7) G1SR(O:010/2) CS1(MAN,TEST):I:010/10 → N7:0/1 SSSR 1 — SLAVE SYSTEM START RELAY1

2 — SSSR1(N7:0/1) → TON T4:1 (1 SEC, 180 SEC) DN — ENGINE MAINTAIN TIMER1

3 — SSSR1(N7:0/1) T4:1/DN STR1(I:010/3) T4:26/DN ORR1(N7:0/0) EMR1(N7:0/2) → TON T4:23 (1 SEC, 45 SEC) DN — 45 SEC. DELAY TO CRANK

4 — T4:23/DN OCR1(O:010/3) → N7:0/2 EMR1 — ENGINE MAINTAIN RELAY1

5 — EMR1(N7:0/2) → N7:0/3 PR1 — PILOT RELAY1

6 — EMR1(N7:0/2) SSSR1(N7:0/1) STR1(I:010/3) T4:26/DN → O:010/1 FVR1 — FUEL VALVE RELAY1

7 — PR1(N7:0/3) RIR1(N7:0/4) T4:3/DN ORR1(N7:0/0) → TON T4:2 (1 SEC, 15 SEC) DN — CRANK CYCLE TIMER1

8 — PR1(N7:0/3) RIR1(N7:0/4) T4:2/DN → O:010/0 SR1 — START RELAY1

9 — PR1(N7:0/3) RIR1(N7:0/4) T4:2/DN → TON T4:3 (1 SEC, 10 SEC.) DN — CRANK REST TIMER1

10 — PR1(N7:0/3) RIR1(N7:0/4) T4:4/DN ORR1(N7:0/0) → TON T4:4 (1 SEC, 115 SEC.) DN — TOTAL CRANK TIMER1

11 — EMR1(N7:0/2) RIR1(N7:0/4) ORR1(N7:0/0) ESS1(CT):I:010/1 → N7:0/4 RIR1 — RECRANK INHIBIT RELAY1

12 — T4:4/DN → O:010/3 OCR1 — OVERCRANK RELAY1

13 — ESS1(OS):I:010/2 → N7:0/6 OSR1 — OVERSPEED RELAY1

14 — EMR1(N7:0/2) RIR1(N7:0/4) ORR1(N7:0/0) → TON T4:5 (1 SEC, 3 SEC.) DN — OIL PRESSURE BYPASS TIMER1

15 — T4:5/DN → O:010/7 OPBR1 — OIL PRESSURE BYPASS RELAY1

GENERATOR 2

16 — CS2(OFF):I:010/12 → N7:1/0 ORR2 — GEN 2 OFF/RESET RELAY

17 — SSR2(I:011/1) G2SR(O:010/14) CS2(MAN,TEST):I:011/2 → N7:1/1 SSSR 2 — SLAVE SYSTEM START RELAY2

18 — SSSR2(N7:1/1) → TON T4:6 (1 SEC, 180 SEC) DN — ENGINE MAINTAIN TIMER

19 — SSSR2(N7:1/1) T4:8/DN STR2(I:010/15) T4:27/DN ORR2(N7:1/0) EMR2(N7:1/2) → TON T4:24 (1 SEC, 45 SEC) DN — 45 SEC. DELAY TO CRANK

20 — T4:24/DN OCR2(O:010/15) → N7:1/2 EMR2 — ENGINE MAINTAIN RELAY2

21 — EMR2(N7:1/2) → N7:1/3 PR2 — PILOT RELAY2

22 — EMR2(N7:1/2) SSSR2(N7:1/1) STR2(I:010/15) T4:27/DN → O:010/13 FVR2 — FUEL VALVE RELAY2

23 — PR2(N7:1/3) RIR2(N7:1/4) T4:8/DN ORR2(N7:1/0) → TON T4:7 (1 SEC, 15 SEC) DN — CRANK CYCLE TIMER2

24 — PR2(N7:1/3) RIR2(N7:1/4) T4:7/DN → O:010/12 SR2 — START RELAY2

25 — PR2(N7:1/3) RIR2(N7:1/4) T4:7/DN → TON T4:8 (1 SEC, 10 SEC.) DN — CRANK REST TIMER2

28 — PR2(N7:1/3) RIR2(N7:1/4) T4:9/DN ORR2(N7:1/0) → TON T4:9 (1 SEC, 115 SEC.) DN — TOTAL CRANK TIMER2

27 — EMR2(N7:1/2) RIR2(N7:1/4) ORR2(N7:1/0) ESS2(CT):I:010/13 → N7:1/4 RIR2 — RECRANK INHIBIT RELAY2

28 — T4:9/DN → O:010/15 OCR2 — OVERCRANK RELAY2

29 — ESS2(OS):I:010/14 → N7:1/6 OSR2 — OVERSPEED RELAY2

30 — EMR2(N7:1/2) RIR2(N7:1/4) ORR2(N7:1/0) → TON T4:10 (1 SEC, 3 SEC.) DN — OIL PRESSURE BYPASS TIMER2

31 — T4:10/DN OIL PRESSURE BYPASS RELAY 2 → O:011/1 OPBR2

SYSTEM OPERATION

32 — SSR1(I:010/7) T4:14/DN → TON T4:11 (1 SEC, 600 SEC, 10 MIN) DN — 10 MIN TIMER

33 — COMP GRT (SOURCE A N7:10, SOURCE B 2466) → N7:3/0 370KW (> 370KW) — START GEN 1

34 — COMP GEQ (SOURCE A N7:10, SOURCE B 1808) T4:17/DN → N7:3/1 225KW (≥ 225KW) — START GEN 2

35 — COMP GEQ (SOURCE A N7:10, SOURCE B 1200) → N7:3/2 100KW (≥ 100KW) — START GEN 1

36 — COMP LES (SOURCE A N7:10, SOURCE B 1258) G1RR(N7:3/8) → N7:3/6 100KW (< 100KW) — START 24 HR. SHUTDOWN

37 — COMP LES (SOURCE A N7:10, SOURCE B 1698) ESS1(CT):I:010/1 T4:17/DN → N7:3/3 200KW (< 200KW) — STOP GEN 2

38 — COMP LIM (LOW LIMIT 1917, TEST N7:10, HIGH LIMIT 2466) ESS1(CT):I:010/1 CS2(OFF):I:010/12 <100KW(N7:3/2) → N7:3/5 250-370 (≤ 250KW, ≤ 370KW) — STOP GEN 1

39 — 250-370(N7:3/5) → TON T4:25 (1 SEC, 300 SEC, 5 MIN) DN — 5 MIN STOP GEN 1

DANE COUNTY

CUSTOMER

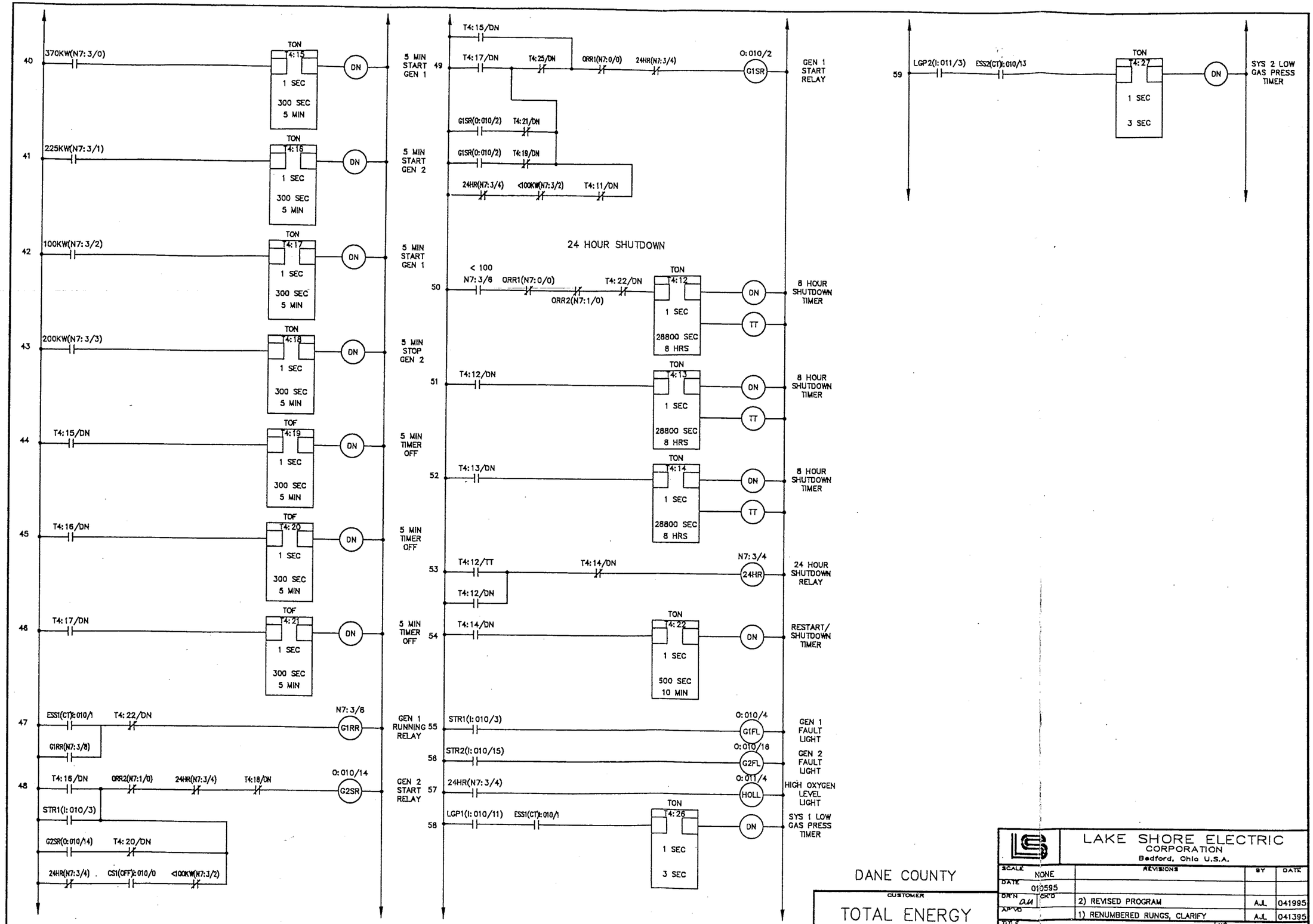
TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	010395	3) REVISED PROGRAM	AJL	041995
DR'N AJL	CK'D	2) ADDED RUNGS FOR EMR'S	AJL	041395
APV'D		1) ADDED TD'S	DJA	021795

TITLE: GENERATOR SWITCHGEAR PLC SCHEMATIC

NO. 952-0148-12 SHT 1 OF 2



DANE COUNTY

CUSTOMER

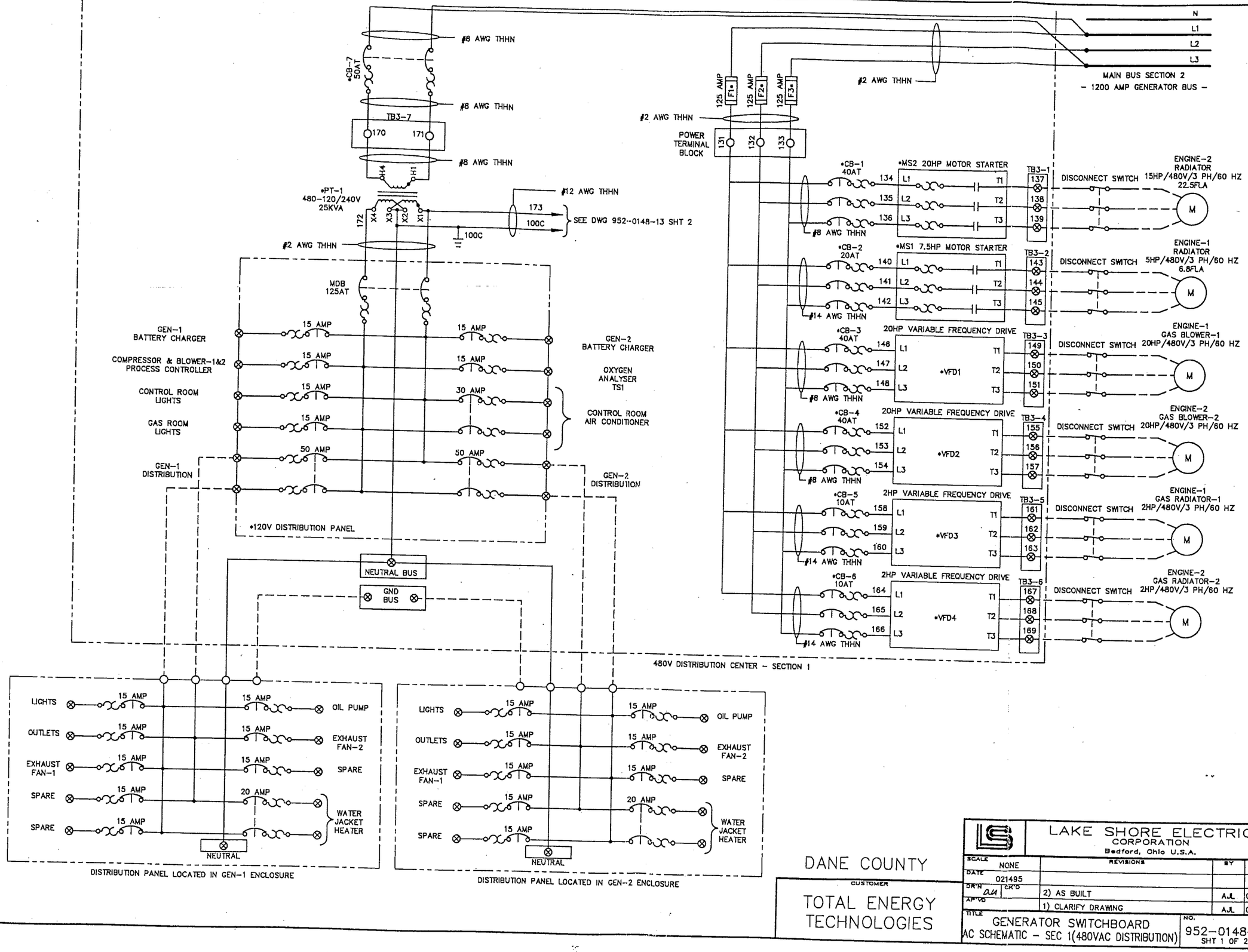
TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	010595			
DR'N	AM	2) REVISED PROGRAM	AJL	041995
CK'D		1) RENUMBERED RUNGS, CLARIFY	AJL	041395
APV'D				

TITLE: GENERATOR SWITCHGEAR PLC SCHEMATIC

NO. 952-0148-12 SHT 2 OF 2



DANE COUNTY

CUSTOMER

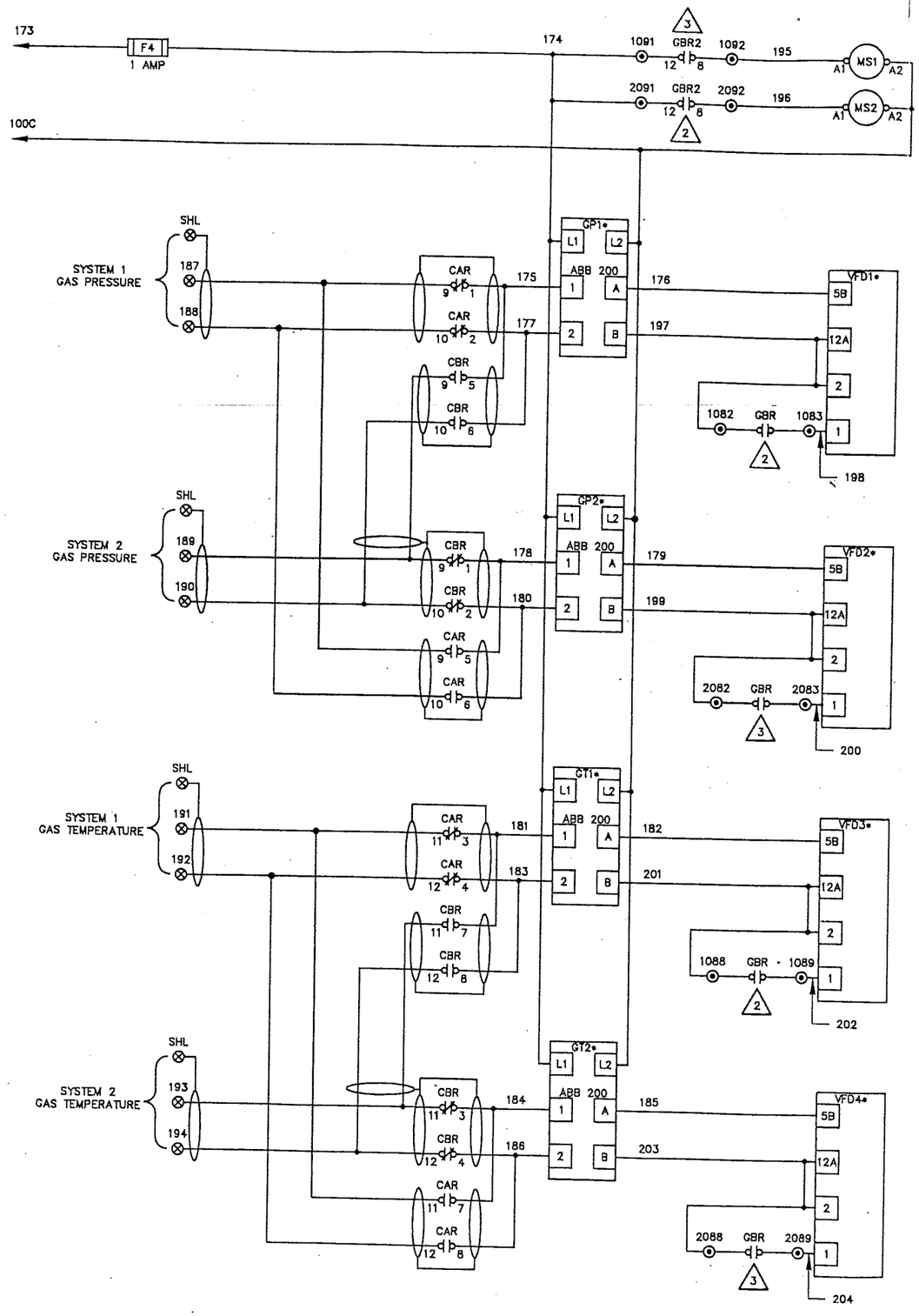
TOTAL ENERGY TECHNOLOGIES

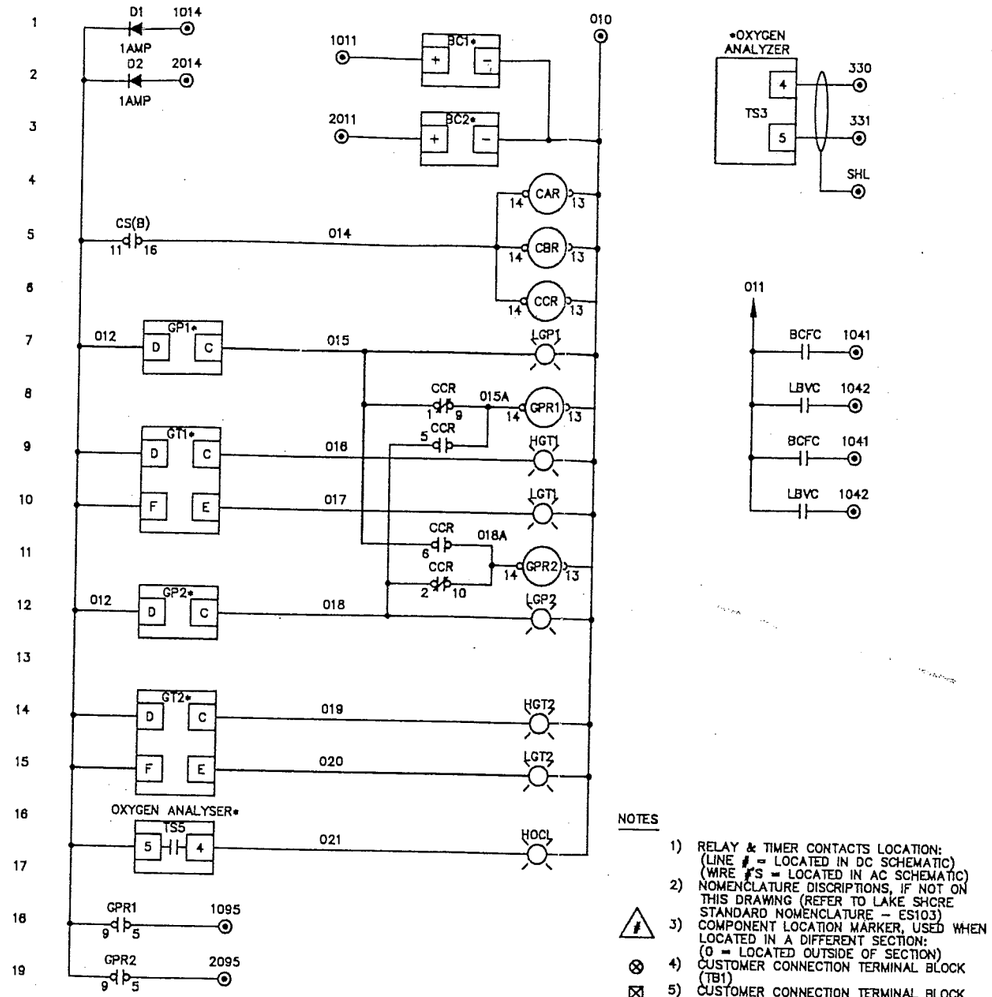
LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	021495			
DR'N AM	CK'D	2) AS BUILT	AJL	042495
APV'D		1) CLARIFY DRAWING	AJL	022895

TITLE: GENERATOR SWITCHBOARD AC SCHEMATIC - SEC 1(480VAC DISTRIBUTION)

NO. 952-0148-13 SHT 1 OF 2





NOTES

1) RELAY & TIMER CONTACTS LOCATION: (LINE # = LOCATED IN DC SCHEMATIC) (WIRE #'S = LOCATED IN AC SCHEMATIC)
2) NOMENCLATURE DISCRIPTIONS, IF NOT ON THIS DRAWING (REFER TO LAKE SHORE STANDARD NOMENCLATURE – ES103)
3) COMPONENT LOCATION MARKER, USED WHEN LOCATED IN A DIFFERENT SECTION: (0 = LOCATED OUTSIDE OF SECTION)
4) CUSTOMER CONNECTION TERMINAL BLOCK (TB1)
5) CUSTOMER CONNECTION TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
6) LAKE SHORE CONNECTION TERMINAL BLOCK (TB2 OR TB3)
7) LAKE SHORE CONNECTION TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
8) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (TB4)
9) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
10) CUSTOMER ENGINE TERMINAL BLOCK (ETB)
11) CUSTOMER WIRING
12) CUSTOMER CABLING
13) CUSTOMER SUPPLIED EQUIPMENT
14) LAST WIRE # USED –

DC CONTROL CIRCUIT	021
AC CONTROL CIRCUIT	194
AC C.T. CIRCUIT	200
AC INSTRUMENT CIRCUIT	300
AC REGULATOR CIRCUIT	400
48VDC CONTROL CIRCUIT	500
125VDC CONTROL CIRCUIT	600

DANE COUNTY

CUSTOMER

TOTAL ENERGY TECHNOLOGIES

LAKE SHORE ELECTRIC CORPORATION
Bedford, Ohio U.S.A.

SCALE	NONE	REVISIONS	BY	DATE
DATE	021495			
DR'N	CR'D	2) AS BUILT	AJL	042495
APP'VD		1) ADDED MS1&MS2, CLARIFY DRAWING	AJL	030195

TITLE: GENERATOR SWITCHBOARD AC & DC SCHEMATIC – SEC 1

NO. 952-0148-13
SHT 2 OF 2