CITY OF HASTINGS, NEBRASKA
ADDENDUM NO. 1, 11-26-25
480V SWITCHGEAR INSTALLATION
NORTH DENVER STATION UNIT 5
Contract No. HU 2025-140

This addendum document must be signed and submitted with your bid package.

The following bid sections were updated accordingly:

- Section 3.1 – General – *Changed the point of contact for the project.*
- Section 3.4 – Scope of Work/Technical Specification:
  - *Clarified that Hastings Utilities will be handling the lifting, moving, and rigging.*
  - *Clarified that the Contractor will need to support the cable tray*
  - *Clarified that the Contractor will be responsible to remove and reinstall the buss bar splice in the middle section*
  - *Clarified that any wire length issues will be handled on a change order basis and on a case-by-case basis for remedy method.*

Provided the following information with this addendum:

- *Original construction drawings of the existing gear*
- *One Line drawings of the existing 480V switchgear*
- *Existing Transformer Drawings*

CITY OF HASTINGS

By Derek Pfeifer

Title Production Engineer

The undersigned bidder hereby certifies that the revision set forth in this addendum have been incorporated in their bid and are a part of the contract documents.

Signed _____

Title _____

Firm _____

Date _____

ALL ISSUED ADDENDUM(S) MUST BE ACKNOWLEDGED
& RETURNED WITH YOUR BID DOCUMENTS

SECTION 3 – SCOPE OF WORK & TECHNICAL SPECIFICATION

SECTION 3-0 SCOPE OF WORK & TECHNICAL SPECIFICATION

3.1 General

The City of Hastings ("Hastings") is accepting bids for the removal of existing 480V switchgear and installation of replacement switchgear for the North Denver Generator #5 in Hastings, Nebraska.

The Bidder is REQUIRED to visit the site prior to submitting a bid to ensure that the bidder can complete the switchgear replacement within the outage dates. The Bidder shall inform himself of all conditions and factors which would affect the execution of the work. No claims for financial compensation or time extension, based on the lack of such prior information (or its effect on the cost of the work) will be permitted by the Owner. Please contact ~~Nathan Bren, Electrical Engineer, at 402-462-3652~~ Derek Pfeifer, Production Engineer at 402-463-3676 if you have any questions about this project or to set up a visit.

The Owner is recommending that the Bidder provide plenty of time for the bid packages to arrive. There have been multiple bids recently that were not delivered on time due to the shipping companies' delays. Please ensure the bids are mailed with adequate time. They will be promptly opened at 1:30pm on the bid opening day, and late bids cannot be considered.

3.2 Schedule

This shall include the completion of various activities in accordance with the milestone time periods and dates listed. The Contractor shall submit a preliminary project schedule including existing switchgear removal, new switchgear installation, and electrical connections.

Major Milestone Schedule:

Activity	Schedule
Bid Opening	Friday, December 12, 2025
Contract Award Date	Anticipated – December 19, 2025
Outage Start Date – Start of Work	January 4, 2026
Eaton Switchgear Testing – Electrical Connections Due	January 27, 2026
Outage End Date – Completion Due	January 31, 2026

3.3 Site Description

The new switchgear will occupy the same footprint as the existing switchgear, located in the basement of the North Denver Station (NDS) plant, located adjacent to the City of Hastings office buildings at 1228 N. Denver Ave.

3.4 Scope of Work/Technical Specification

3.4.1 Remove Existing Switchgear

- Remove existing gear while preserving all existing cables.

- Modification of cable trays, conduit, and power cables may be necessary.
- ~~COH can provide assistance by operating overhead crane to lift switchgear from basement to ground floor if necessary.~~ COH will handle all rigging, transporting, and lifting of the new and existing gear. COH will be responsible to remove the floor grating and structural steel, remove the water and air lines, move the existing and new gear, lower the new gear to the basement, and raise the existing gear to the first floor.
- Contractor will be responsible to support the existing cable tray during construction. The cable tray is welded to the top of the existing gear.
- ~~COH will provide a trailer for the switchgear to be placed on.~~ COH will handle getting the existing gear to the first floor and disposal.
- COH will de-energize gear and provide a spot for Contractor to place a lock for LOTO. Some control wiring may still be energized.

3.4.2 Move New Gear – COH scope

- ~~Lower new switchgear from ground floor to basement. COH will remove piping and steel that is blocking the path.~~
- ~~COH can provide assistance by operating overhead crane to lower switchgear to basement. Contractor will be responsible for rigging switchgear sections for lifting.~~
- ~~Move new switchgear into place.~~
- ~~Contractor will supply any other equipment required to move switchgear sections.~~
- Contractor will need to remove the buss bar splice plate off the middle section of new gear to permit sliding the three sections together.

3.4.3 Install New Switchgear (Eaton Magnum PXR UL switchgear, split in 3 sections)

- See attached document (NDS 5 Eaton Switchgear Drawings - Final 2025-10-20.pdf)
- Provide all equipment and materials necessary for installation.
- Perform all necessary steps to fasten switchgears sections together
- Note from Eaton: Contractor may need to drill the mounting holes during the SWGR installation.
- Connect new switchgear bus to existing transformers. Eaton placed a small cutout in the side sheet for the transformer connections to go through, Contractor will have to drill bolt holes for the connection.
- COH will perform necessary concrete work before work is scheduled to begin. This includes adding to base due to increased switchgear size and removing section of berm to allow easier access to switchgear. This has been completed and is ready for the contractor.

3.4.4 Reconnect existing cables

- Provide and perform all necessary raceway and conduit modification.
- Reconnect existing cables to new breakers.
- If the existing cables are too short, the chosen remedy will be decided between COH electrical supervisor and the Contractor, and will be handled on a change order basis.

3.4.5 Installed equipment must meet NFPA 70 - National Electric Code (NEC) and all other applicable codes and standards.

3.4.6 Examination of Sites

Each respondent is considered to have examined the work site to fully acquaint itself with the exact existing conditions relating to the work and to fully understand the work involved

and the difficulties and restrictions regarding the proposed work. The submission of a bid will be considered as conclusive evidence that the respondent has made such examination.

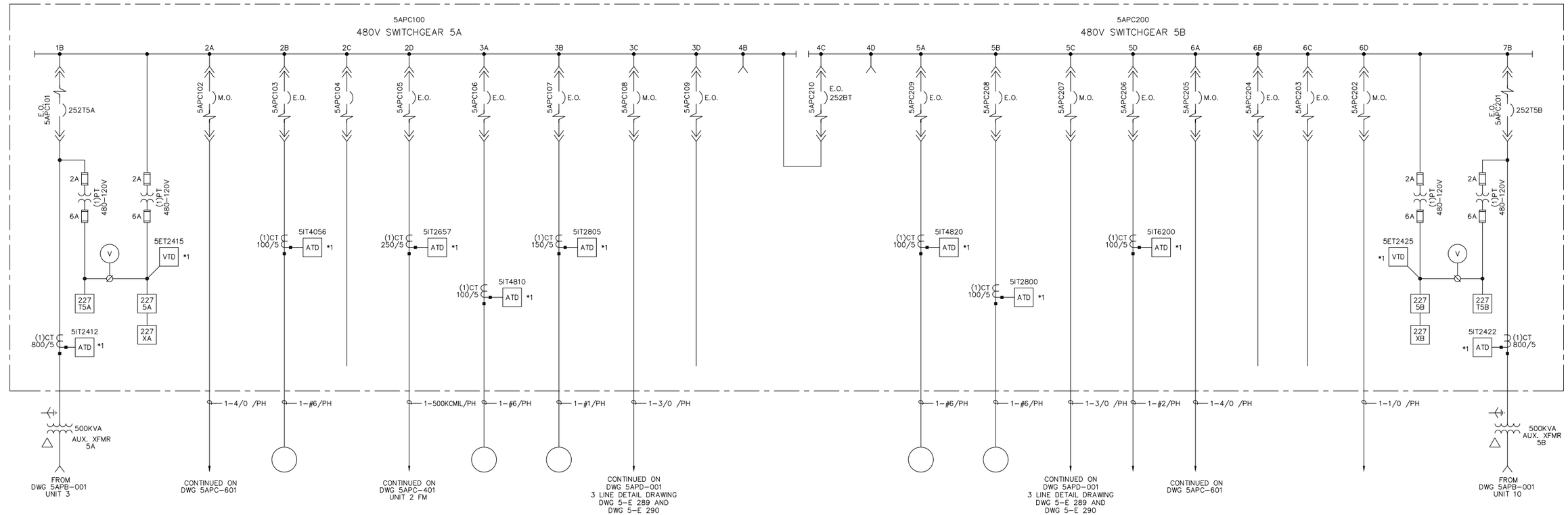
3.5 Work Not Included Under These Specifications

3.5.1 Switchgear procurement
3.5.2 Concrete work
3.5.3 Old Switchgear Disposal
3.5.4 Commissioning Testing – To be done by Eaton in last 3 or 4 days of outage.
3.5.5 Lifting, moving, or rigging the existing and new gear

3.6 Attachments

- NDS 5 Eaton Switchgear Drawings - Final 2025-10-20.pdf

CURRENT ONE LINE DRAWING



BREAKER SCHEM DIAG	5APC-002			5APC-005		5APC-006	5APC-007	5APC-009	5-E 289			5APC-004		5APC-008	5APC-010	5-E 289	5APC-011						5APC-003
WIRING DIAG	5APC-002			5APC-005		5APC-006	5APC-007	5APC-009	5-E 286			5APC-004		5APC-008	5APC-010	5-E 270	5APC-011						5APC-003
A.C.B. RATINGS AMP	800		225	70	40	225	90	125	225	90		500		90	90	225	90	225	40	40	150		800
LOAD RATING HP OR KVA	500KVA			30		150	40	75	150KVA					40	40	150KVA							500KVA
SERVICE	AUXILIARY XFMR 5A 2400-480V	POT XFRM COMPT	TURB RM MCC DWG 5APC-601	TURB AUX OIL PUMP	UNASSIGNED	EMERG FEED COOLING TOWER	CONDENSATE PUMP 5-1	U5 STATION AIR COMPRESSOR (NEW ATLAS COPCO)	LIGHTING XFMR 5-A	SPARE	FUTURE	BUS TIE	SPARE	CONDENSATE PUMP 5-2	INSTRUMENT AIR COMPR 5A (PENNSYLVANIA)	LIGHTING XFMR 5-B	OIL PUMP HOUSE	BOILER RM MCC DWG 5APC-601	FUTURE	SPARE	WELDER RECEPTACLES	POT XFMR COMPT	AUXLIARY XFMR 5B 2400-480V

REFERENCE DRAWINGS:

*1 5APC-015

SUPERSEDES PART OF DWG. E-206, DATED 1-3-67

Temporary Permit to Practice Engineering in Nebraska
Mr. Glenn E. Milkert (Electrical)
Permit No.: T0127; Expiration Date: 12/1/2001
State of Licensure: Missouri; No. E-13956
Project: Hastings Utilities, Units 4&5 Control Systems Upgrade

Hastings Utilities
North Denver Station

UNIT 5 – 480V SWITCHGEAR
ONE-LINE DIAGRAM

Rev. 7

5APC-001

NO	DATE	REVISIONS	DWN	CK	ACC	APP
7	4/26/24	ADDED ADDTL REFS TO CKTS 3C AND 5C	DR			
6	7-10-06	ADDED REFERENCES TO CKTS 3C AND 5C	SH			
5	7-1-02	CONFORMING TO CONSTRUCTION RECORDS	YCP	GEM		AMA
4	8-30-01	CONFORMING TO CONSTRUCTION RECORDS	YCP	GEM		AMA
3	2-2-01	FIELD CONSTRUCTION MARKS	KML	GEM		AMA
2	10-25-00	ISSUED FOR CONSTRUCTION	MLC	JDC		AMA
0	9-12-00	ISSUED FOR BID	RLK	TAD		JGH

Sega ®
STILWELL, KANSAS
99475607

REGISTERED PROFESSIONAL ENGINEER
STATE OF MISSOURI
GLENN E. MILKERT
NUMBER E-13956

09-08-2000 10:22am - Lvl. C

HINGE PANEL (RV)

CUBICLE 1 (FV)

AMCO A AMC

V2 V V1

CV–7 | 227A

B17 — 9 7 5 3 1 — 10 8 6 4 2 — 227AB B08 227A

R T5ATP — W G T5AG

43S–A: A1 T5ACP; A12; B1 T5AC3; B12 T5AC2; A6 T5ATP; A7; B6 T5AT1; B7 T5AT4

CS 252T5A: A1 T5AC1; A12 T5AW; A11 T5AT; B1 T5AC2; B12; B11 T5AT1; F1; F12 T5ACP; A6 T5AA; B6; C6; C7 T5AAL; D6; D7 T5ACP

VS: A1 V2; B1 B17; B12 17; A7 V1; B6 08; B7 B08

V1 V2 — AMC AMCO — B17 B08 227A 227AB — B17 B08 — 17 08 T5ACP T5AC1 T5AC3 T5AG T5AW T5ATP T5AT T5AT4 T5AA T5AAL

1 AMC; 2 AMCO; 3 B17; 4 B08; 5; 6; 7; 8; 9 T5ACP; 10 T5AC; 11 T5AC1; 12 T5AC3

1 T5AG; 2 T5AW; 3 T5ATP; 4 T5AT; 5 T5AT4; 6 T5AT5; 7 T5AA; 8 T5AT4; 9 T5APA; 10 T5AAL1; 11 T5AAL2; 12 T5A17

SEE DWG. 5APC–002 FOR FIELD WIRING

1 T5A18; 2 T5A21; 3 T5A22; 4 T5A23; 5 T5A24; 6; 7; 8; 9; 10; 11; 12

B08 — 08 B08 — 227A 227B — 11 12 B11 B12 — B17 — 17

1 2 B1 B2

11 12 H1 H2 X1 X2 7 08 — 2–PT'S 480–120V — B11 B12 H1 H2 X1 X2 B7 B08

1 2 B1 B2 4–2A — 11 12 B11 B12

AP10 — T5BT AL4–3 T5BT2 227AB 227A — 227XAL BTC1 227XAL1 BTC2 T5AT2 227X T5AT3 — DEV 227X–A

B7 1–6A B17

BTT3 BTT4 — 17 08 — DEV 227T5A

7 08 B7 — B7 — 7 08

08 B08 — BTC1 227X — BTC1 227X

AP–10 AL4–4 227AB T5BT T5BT2 T5AT2 T5AT3 BTC2 227XAL 227AL — T5ATP T5AT 227X 227X1 BTC BTC1 BTT1 BTT2 227AL 227AL1 — T5ATP T5AT T5AT2 T5AT3 T5BT T5BT2 BTC BTC1 BTC2 BTT1 BTT2 BTT3 BTT4 227AB 227AL 227AL1 227X 227X1 227XAL 227XAL1 AP10 AL4–3

BTT3 BTT4

T5AT 227X 227X1 BTC BTT1 BTT2 227AL 227AL1

T5ACP T5ACN T5ATN — T5ACP T5ACN T5ATN

CONTINUED ON DWG. 5–E 268

TO 500 K.V.A. TRANS. 5A — ø1 ø2 ø3 N — X1 X2 X3 X0

TOP 1 12 11 A R L R B — BOT 5 6 7 A R L R B — W–2" 435–A

TOP 1 12 11 A C O T B — C C O T D — P E CTO F — BOT 5 6 7 A T O C B — ST SC C — ST SC D — P E CTO F — W–2" CS

TOP 1 12 11 A B I O B — BOT 5 6 7 A O I B B — W–2" VS

TYPE CV–7 DEV 227A

ICS CV — CV — ICS — CV — 1 2 3 4 5 6 7 8 9 10

ø1 A ø2 B ø3 C N — REMOVABLE LINK

1P 1N — 4003 DWG 5–E 286 — 125V D.C. M.C.C. — 1P 1N

T5AC T5AT T5AG T5APA T5AA T5AAL1 T5AAL2 T5A17 T5A18 T5A21 T5A22 T5A23 T5A24 — T5AC1 T5A5 — T5ACP T5ATP

1 2 — A B C — BTC1 T5ACP BTC BTT2 T5AT T5AG T5A17 T5APA T5A18 T5AAL T5AAL1 T5AAL2 T5ACN — 1 2 — T5AAL1 T5AAL2 T5A22 T5A23 227X1 T5A24 — DEV 252T5A — CELL 1B

SEE FIG_1 DWG. 5–E 271 — 5APC101 — MAIN FEED — E.O. 800A (FOR SCHEMATIC DIAGRAM SEE DWG 5APC–002)

T5AC T5AT — T5AT T5AC — 33 252T5A — T5AT5 T5AC1

B1 B2 — 1–CT 800:5A — TO 5APC–015

P N — 2PST KN SW 30A 250V — T5AN T5AP — 10A 6A — T5ACP T5ACN T5ATP T5ATN

1P 1N — P N — 2PDT KN SW 60A 250V — 2P 2N

2P 2N — 2P 2N — ø1 ø2 ø3 A B C

P N — P N

B08 08

GRD BUS

TOP 1 12 11 A C O T PO B — BOT 5 6 7 A T PO L C B — CS W2

REFERENCE DRAWINGS:

5APC–001 480V SWGR ONE–LINE DIAGRAM

SUPERSEDES DRAWING: E 267, REV. B, DATED: 5–22–67

Hastings Utilities
North Denver Station

UNIT 5
480V SW. GR.–CUB. 1
WIRING DIAGRAM

Rev. 1

5–E 267

CURRENT ONE LINE DRAWING

NO	DATE	REVISIONS	DWN	CK	ACC	APP
1	7–11–06	AS–BUILT	SH			
0	8–30–01	CONFORMING TO CONSTRUCTION RECORDS	YCP	JDC		AMA

Sega ®
STILWELL, KANSAS
99475807

09–05–2000 10:56am – Ltd. B

CONTINUED FROM DWG. 5-E 267

5406 480V TURB. RM. M.C.C. DWG. 5-E 281

5410 MAIN AUX. OIL PUMP MOTOR

5APC105 480V COOLING TWR. SW. GR. DWG. 5APC-401

CUBICLE 2(FV)

1	2AAL
2	6AAL1
3	
4	
5	
6	
7	2BP1
8	2BC
9	2BT
10	2BG
11	2B5
12	2B6
1	2B7
2	2B9
3	2B10
4	2B11
5	2B12
6	2B13
7	2B14
8	2B15
9	2B12
10	
11	
12	

SEE DWG. 5APC-005 FOR FIELD WIRING

2AAL
2AAL1

SEE FIG 4
DWG. 5-E 269
TURB. RM. M.C.C.
M.O. 225A

CELL 2A

1-CT 200:5A
TO 5APC-015

2B9 2B10 2B9C 2B11 2B12 2B6 2B13 2B5 2B14 2B15 2B7 2B16 2BN1

CELL 2B

SEE FIG 3
DWG. 5-E 269
MAIN AUX. OIL PUMP
E.O. 70A
(FOR SCHEM. DIAGR. SEE DWG. 5APC-005)

5APC103

2C9 2CP1 2C10 2C9C 2C11 2C12 2C6 2C13 2C5 2C14 2C15 2C7 2C16 2CN1

CELL 2C

SEE FIG 3
DWG. 5-E 269
UNASSIGNED
M.O. 40A

1-CT 250:5A
TO 5APC-015

2D9 2DP1 2D10 2D9C 2D11 2D12 2D6 2D13 2D5 2D14 2D15 2D7 2D16 2DN1

CELL 2D

SEE FIG 3
DWG. 5-E 269
COOLING TOWER EMERGENCY FEED
E.O. 225A
(FOR SCHEM. DIAGR. SEE DWG. 5APC-006)

5APC105

2BP1
2BN1
2CP1
2CN1
2DP1
2DN1

2CC 2CT 2CG 2C5 2C6 2C7 2C9 2C10 2C11 2C12 2C13 2C14 2C15 2C16

3-2PST KN SW 30A 250V

10A

2BP1 2BN1 2CP1 2CN1 2DP1 2DN1

SEE DWG. 5APC-006 FOR FIELD WIRING

1	2CP1
2	2CC
3	2CT
4	2CG
5	2C5
6	2C6
7	2C7
8	2C9
9	2C10
10	2C11
11	2C12
12	2C13
1	2C14
2	2C15
3	2C16
4	
5	
6	
7	2D1
8	2DC
9	2DT
10	2DG
11	2D5
12	2D6
1	2D7
2	2D9
3	2D10
4	2D11
5	2D12
6	2D13
7	2D14
8	2D15
9	2D16
10	
11	
12	

P N P N P N

P N P N

GRD BUS

MOTOR
COND. PUMP 5-1

5430

CUBICLE 3(FV)

1	3AP1
2	3AC
3	3AT
4	3AG
5	3A5
6	3A6
7	3A7
8	3A9
9	3A10
10	3A11
11	3A12
12	3A13
1	3A14
2	3A15
3	3A16
4	
5	
6	3BN1
7	3BP1
8	3BC
9	3BT
10	3BG
11	3B5
12	3B6
1	3B7
2	3B9
3	3B10
4	3B11
5	3B12
6	3B13
7	3B14
8	3B15
9	3B16
10	
11	
12	

3AC 3AT 3AG 3A5 3A6 3A7 3A9 3A10 3A11 3A12 3A13 3A14 3A15 3A16

SEE DWG. 5APC-007 FOR FIELD WIRING

SEE DWG. 5APC-009 FOR FIELD WIRING

1-CT 200:5A
TO 5APC-015

3A9 3AP1 3A10 3AC 3A11 3AT 3A12 3AG 3A13 3A5 3A14 3A6 3A15 3A7 3A16 3AN1

CELL 3A

SEE FIG 3
DWG. 5-E 269
CONDENSATE PUMP 5-1
E.O. 90A
(FOR SCHEM. DIAGR. SEE DWG. 5APC-007)

5APC106

1-CT 200:5A
TO 5APC-015

3B9 3BP1 3B10 3BC 3B11 3BT 3B12 3BG 3B13 3B5 3B14 3B6 3B15 3B7 3B16 3BN1

CELL 3B

SEE FIG 3
DWG. 5-E 269
STATION AIR COMPRESSOR
E.O. 125A
(FOR SCHEM. DIAGR. SEE DWG. 5APC-009)

5APC107

3AP1
3BP1

3CAL 3CAL1

CELL 3C

SEE FIG 4
DWG. 5-E 269
LTG. TRANS. 5-A
M.O. 225

3D9 3DP1 3D10 3DC 3D11 3DT 3D12 3DG 3D13 3D5 3D14 3D6 3D15 3D7 3D16 3DN1

CELL 3D

SEE FIG 3
DWG. 5-E 269
UNASSIGNED
E.O. 90A

5435 STATION AIR COMPRESSOR MOTOR (WORTHINGTON)

5425 LTG. TRANS. 5-A DWG. 5-E 289

T5ATP T5AT T5AT2 T5AT3 T5BT T5BT2 BTC BTC1 BTC2 BTT1 BTT2 BTT3 BTT4 227AB 227AL 227AL1 227X 227X1 227XAL 227XAL1 3CAL 3CAL1 AP10 AL4-3 2AAL 2AAL1

1	3CAL
2	3CAL1
3	
4	
5	
6	
7	3DP1
8	3DC
9	3DT
10	3DG
11	3D5
12	3D6
1	3D7
2	3D9
3	3D10
4	3D11
5	3D12
6	3D13
7	3D14
8	3D15
9	3D16
10	
11	
12	

3AP1 3AN1 3BP1 3BN1 3DP1 3DN1

3CAL 3CAL1

3-2PST KN SW 30A 250V

10A

3AP1 3AN1 3BP1 3BN1 3DP1 3DN1

P N P N P N

P N P N

GRD BUS

CONTINUED ON DWG. 5-E 269

SUPERSEDES DRAWING: E 268, REV. C, DATED: 12-10-68

REFERENCE DRAWINGS:

5APC-001 480V SWGR ONE-LINE DIAGRAM

CURRENT ONE LINE DRAWING

NO	DATE	REVISIONS	DWN	CK	ACC	APP
1	7-11-06	CHANGED "LTG. TRANS. 5-1" TO 5-A	SH			
0	8-30-01	CONFORMING TO CONSTRUCTION RECORDS	YCP	JDC		AMA

Sega ®
STILWELL, KANSAS
99475825

Hastings Utilities
North Denver Station

UNIT 5
480V SW. GR.—CUB. 2 & 3
WIRING DIAGRAM

Rev. 1

5-E 268

09-05-2000 10:56am - Lvl. 8

CONTINUED FROM DWG. 5-E 268

HINGE PANEL (RV)

CUBICLE 4 (FV)

CONTINUED ON DWG. 5-E 270

2AAL
2AAL1
3CAL
3CAL1
AP10
AL4-3

BTG1
BTAL

AP10
AL4-3

227X2
227AL2
BTN1

74AL
74AL1

BTT
227AL3
74AL
AL4-3

T5AT
T5AT2
T5BTP
T5BT
T5BT2
T5BT3
BTC
BTC1
BTC2
BTT
BTT1
BTT2
BTT3
227AB
227AL2
227AL3
227X
227X2
227XAL
227XAL1
BTN1

BTP1
BTC
BTC2
BTT
BTT4
BTG
BTG1
BTA
BTAL
227AB
T5ATP
T5AT3
T5BTP
T5BT3

1	T5ATP
2	T5AT3
3	227AB
4	BTC2
5	BTT4
6	BTC
7	T5AT
8	T5AT2
9	T5BT
10	T5BT2
11	BTC1
12	BTT1

1	BTT2
2	BTT3
3	227X
4	227XAL
5	227XAL1
6	227AL
7	227AL1
8	227X1
9	
10	
11	
12	

1	74AL
2	74AL1
3	227XAL
4	227XAL1
5	227AL
6	227AL3
7	4BAL
8	4BAL1
9	BTP1
10	BTT
11	BTG
12	BTG1

SEE DWG. 5APC-004 FOR FIELD WIRING

1	BTAL1
2	BTAL2
3	BTPA
4	BTAL
5	BT7
6	BT13
7	BT14
8	
9	AL4-3
10	4DP1
11	4DC
12	4DT

1	4DG
2	4D5
3	4D6
4	4D7
5	4D9
6	4D10
7	4D11
8	4D12
9	4D13
10	4D14
11	4D15
12	4D16

A11	BTP1
B1	227AB
B12	BTCT
B11	BTC2
C12	T5ATP
D12	T5AT3
B7	BTT4
C6	T5BTP
D6	T5BT3

43T

R
W
G
BTG
BTP1

A1	BTC
A12	
A11	BTT
B1	BTCT
B12	
B11	
F1	BTG1
F12	
A6	BTA
B6	
C6	
C7	BTAL
D6	
D7	BTP1

CS
252BT

74AL1
74AL
P
N
DEV 47

4BAL
4BAL1
1 2 3
CELL 4B
SEE FIG 4 THIS DWG.
FUTURE M.O.

BTC
227X1
227AL1

P
N

BTP1
BTT
BTG
BTA

227AL1 BTP1 227AL2 227X1 BTT BTG 227X2 BT13 BTAL1 BTAL2 BTPA BT7 BTN1

1 2 3
DEV 252BT
CELL 4C
SEE FIG 2 THIS DWG.
BUS TIE
E.O. 500A
FOR SCHEMA. DIAGR.
SEE DWG. 5APC-004

409 4DP1 4D10 4D11 4D12 4D13 4D14 4D15 4D16 4DN1

CELL 4D
SEE FIG 3 THIS DWG.
FUTURE
E.O.

BTP1
BTN1
4DP1
4DN1

BTT
BTG
BTAL1
BTAL2
BT7
BT13
BT14
BTPA

2-2PST KN SW 30A 250V
P N
20A
BTP1 BTN1

P N
10A
4DP1 4DN1

BTP1
4DP1

1 A
2 B
3 C

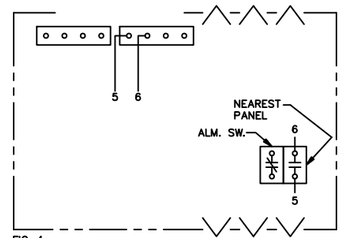
P
N
P
P
N
N

GRD BUS

TOP
BOT
"W-2" 43T

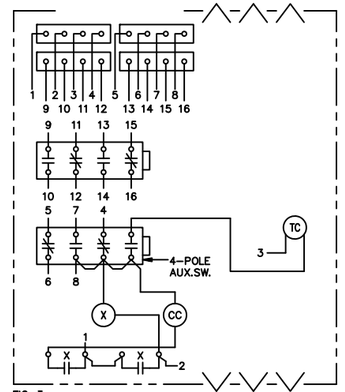
TOP
BOT
"W-2" CS

FIG-4



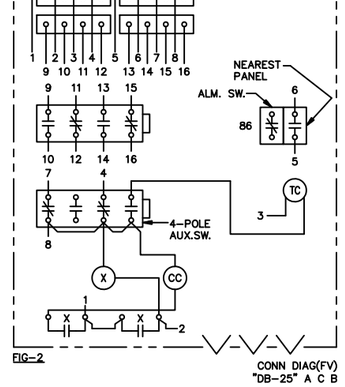
CONN DIAG(FV)
"DB-15" MAN. OPR.

FIG-3



CONN DIAG(FV)
"DB-15" A C B

FIG-2



CONN DIAG(FV)
"DB-25" A C B

REFERENCE DRAWINGS:

5APC-001 480V SWGR ONE-LINE DIAGRAM

SUPERSEDES DRAWING: E 269, REV. B, DATED: 5-22-67

CURRENT ONE LINE DRAWING

NO	DATE	REVISIONS	DWN	CK	ACC	APP
0	8-30-01	CONFORMING TO CONSTRUCTION RECORDS	YCP	JDC		AMA

Sega ®
STILWELL, KANSAS
99475826

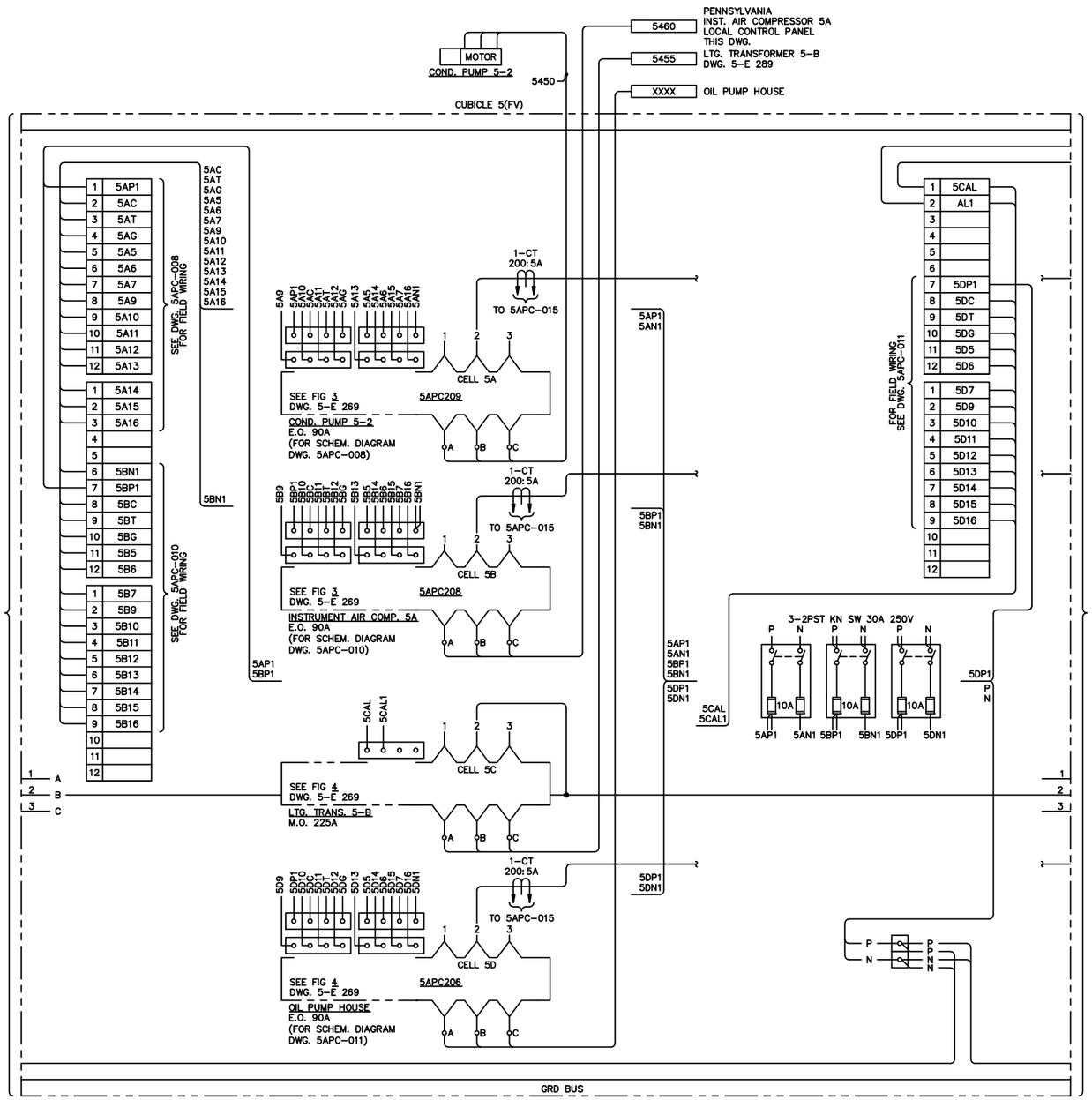
Hastings Utilities
North Denver Station

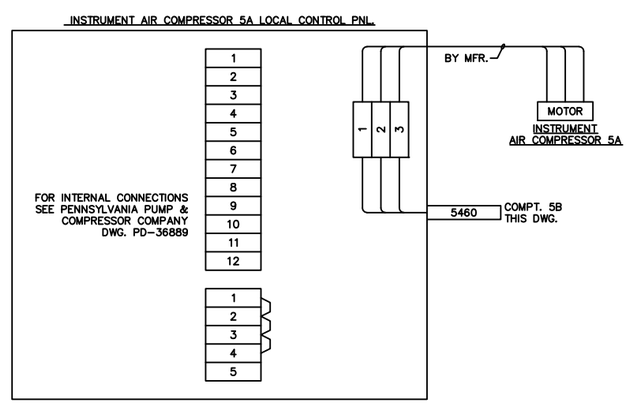
UNIT 5
480V SW. GR.-CUB. 4
WIRING DIAGRAM

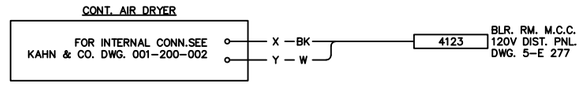
Rev. 0

5-E 269

09-05-2000 10:56am - Lvl 8







SUPERSEDES DRAWING: E 270, REV. C, DATED: 9-26-67

REFERENCE DRAWINGS:

5APC-001 480V SWGR ONE-LINE DIAGRAM

Temporary Permit to Practice Engineering in Nebraska
Mr. Glenn E. Milkert (Electrical)
Permit No.: T0127; Expiration Date: 12/1/2001
State of Licensure: Missouri; No. E-13956
Project: Hastings Utilities, Units 4&5 Control Systems Upgrade

CURRENT ONE LINE DRAWING

NO	DATE	REVISIONS	DWN	CK	ACC	APP
3	7-11-06	CHANGED "LTG. TRANS. 5-2" TO 5-B	SH			
2	7-1-02	CONFORMING TO CONSTRUCTION RECORDS	YCP	GEM		AMA
1	5-3-02	CONFORMING TO CONSTRUCTION RECORDS	YCP	GEM		AMA
0	8-30-01	CONFORMING TO CONSTRUCTION RECORDS	YCP	JDC		AMA

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STILWELL, KANSAS
99475823

STATE OF MISSOURI
REGISTERED PROFESSIONAL ENGINEER
GLENN E. MILKERT
NUMBER E-13956

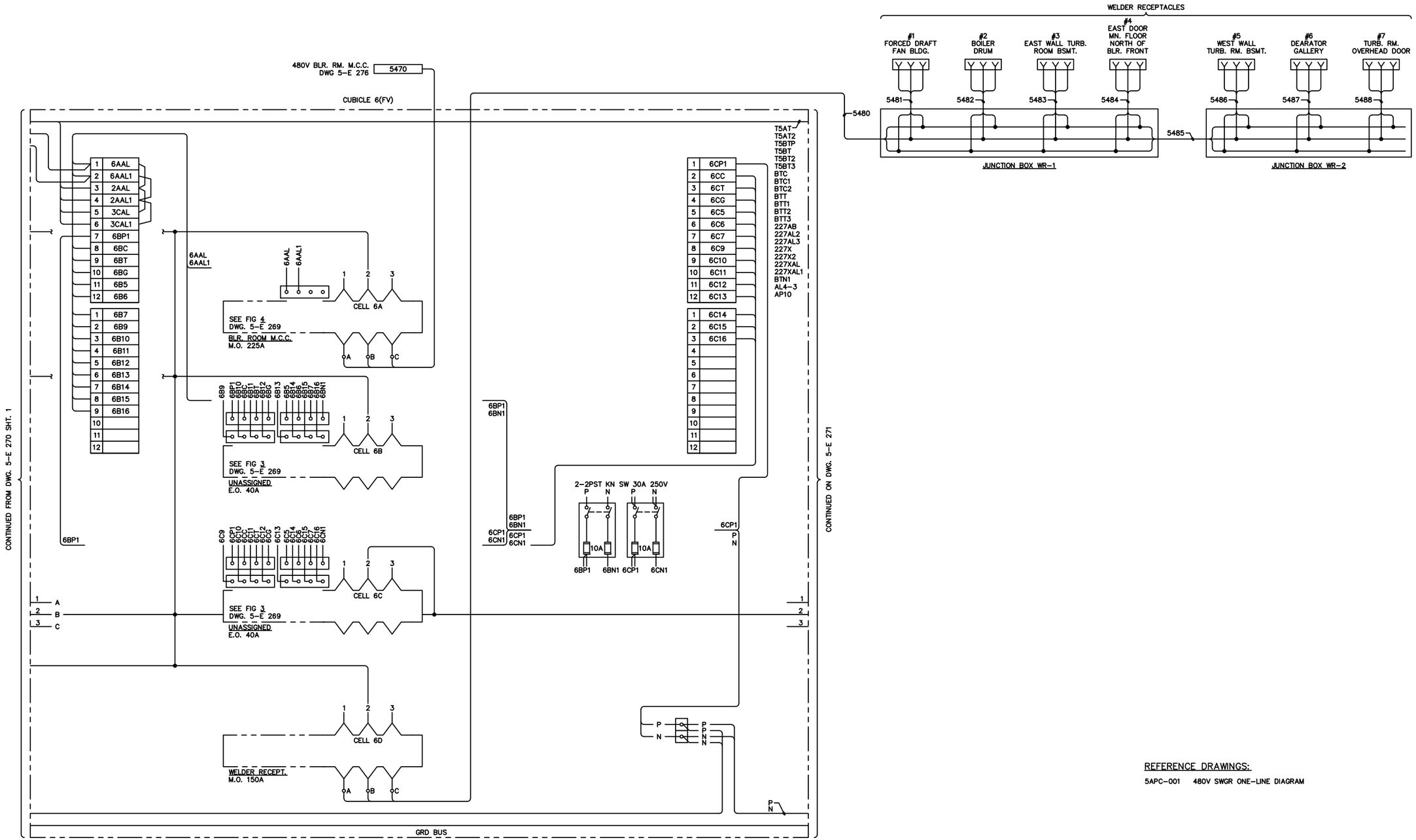
Hastings Utilities
North Denver Station

UNIT 5
480V SW. GR.-CUB. 5
WIRING DIAGRAM

Rev. 3

5-E 270
SHT 1 OF 2

09-05-2000 10:56am - Lvl. 8



CURRENT ONE LINE DRAWING

REFERENCE DRAWINGS:

5APC-001 480V SWGR ONE-LINE DIAGRAM

SUPERSEDES DRAWING: E 270, REV. C, DATED: 9-26-67

NO	DATE	REVISIONS	DWN	CK	ACC	APP
0	8-30-01	CONFORMING TO CONSTRUCTION RECORDS	YCP	JDC		AMA

NO	DATE	REVISIONS	DWN	CK	ACC	APP

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99475824

Hastings Utilities
North Denver Station

UNIT 5
480V SW. GR.-CUB. 6
WIRING DIAGRAM

Rev. 0

5-E 270
SHT 2 OF 2

09-05-2000 10:56am - Lvl. 8

HINGE PANEL (RV)

CUBICLE 7 (FV)

CONTINUED ON DWG. 5-E 270

AMCO A AMC

V2 V V1

CV-7 | 227B

B17 — 9 7 5 3 1 — 10 8 6 4 2 — 227AB B08 227B

R T5BTP

W T5BG G

43S-B: A1 T5BCP; A12; B1 T5BC3; B12 T5BC2; A6 T5BTP; A7; B6 T5BT1; B7 T5BT4

CS 252T5B: A1 T5BC1; A12 T5BW; A11 T5BT; B1 T5BC2; B12; B11 T5BT1; F1; F12 T5BCP; A6 T5BA; B6; C6; C7 T5BAL; D6; D7 T5BCP

VS: A1 V2; B1 B17; B12 17; A7 V1; B6 08; B7 B08

AMC AMCO V1 V2 B17 B08 227B 227AB B17 B08 17 08 T5BCP T5BC1 T5BC3 T5BG T5BW T5BTP T5BT T5BT4 T5BA T5BAL

1	AMC
2	AMCO
3	B17
4	B08
5	
6	
7	
8	
9	T5BCP
10	T5BC
11	T5BC1
12	T5BC3
1	T5BG
2	T5BW
3	T5BTP
4	T5BT
5	T5BT4
6	T5BT5
7	T5BA
8	T5BT4
9	T5BPA
10	T5BAL1
11	T5BAL2
12	T5BT7
1	T5B18
2	T5B21
3	T5B22
4	T5B23
5	T5B24
6	
7	
8	
9	
10	
11	
12	

SEE DWG. 5APC-003 FOR FIELD WIRING

T5BTP T5BT BTC BTC1 BTT BTT1 227AL2 227AL3 227X2 BTN1

B08 — B17

08 B08 — 227B 227AB — 17

AP-10 AL4-4 T5AT T5AT2 T5BT2 T5BT3 BTC2 227AB 227X 227XAL 227XAL1

BTT3 BTT4

T5BT BTC BTC1 BTT BTT1 227AL2 227AL3 227X2 BTN1

T5BC T5BT G5BPA T5BA T5BAL1 T5BAL2 T5B17 T5B18 T5B21 T5B22 T5B23 T5B24

T5BC1 T5BT5

T5BCP T5BTP

T5BTP

2-PT'S 480-120V

11 12 H1 H2 X1 X2 7 08

B11 B12 H1 H2 X1 X2 B7 B08

11 12 B11 B12

1 2 B1 B2 4-2A

DEV 227X-B: AP10 227XAL; T5AT BTC1; AL4-3 227XAL1; T5AT2 BTC2; 227AB T5BT2; 227B 227X; T5BT3

B7 1-6A B17

DEV 227T5B: BTT2; BTT3; 17; 08

7 1-6A 17

1 2 B1 B2

T5BC T5BT BTC1 BTT BTT1 227AL2 227AL3 227X2 BTN1 — T5BCP T5BCN T5BTN

T5AAL1 T5AA1 T5AA2 T5AA22 227X3 227X1 T5A24

DEV 252T5B

SEE FIG 1 THIS DWG.

CELL 7B

5APC201

MAIN FEED

E.O. 800A (FOR SCHEMATIC DIAGRAM SEE DWG 5APC-003)

B1 B2

1-CT 800/5A

TO 5APC-015

T5BC T5BT — T5BT5 T5BC1 — 33 252T5B

2PST KN SW 30A 250V — P N — T5BN T5BP — 10A 6A — T5BCP T5BCN — T5BTP T5BTN

A ø1 B ø2 C ø3

GRD BUS

B08 08

REMOVABLE LINK

BUS COMPT(FV)

NEAREST FRONT

A ø3 B ø2 C ø1 N — X0 X3 X2 X1 — TO 500 K.V.A. TRANS. 5B

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

21 23 22 24 — 12 11 — 10 9 — 86 86 — NEAREST PANEL NEAREST PANEL

13 15 17 19 14 16 18 20 5 4 6 8 7 — TC 3 — X 52X 5B — 1 X X 2

FIG-1

"DB-50" A C B CONN DIAG(FV)

TYPE CV-7 DEV 227B

ICS CV CV ICS — 1 2 3 4 5 6 7 8 9 10

TOP A 1 12 11 R L R B — BOT A 5 6 7 R L R B — "W-2" 43S-B

TOP A 1 12 11 C O T B — BOT C C O T D — P E CTO F — BOT A 5 6 7 T O C B — ST SC C — ST SC D — P E F CTO — "W-2" CS

TOP A 1 12 11 B O O B — BOT A 5 6 7 O O B B — "W-2" VS

SUPERSEDES DRAWING: E 271, REV. B, DATED: 5-22-67

REFERENCE DRAWINGS:

5APC-001 480V SWGR ONE-LINE DIAGRAM

CURRENT ONE LINE DRAWING

NO	DATE	REVISIONS	DWN	CK	ACC	APP
0	8-30-01	CONFORMING TO CONSTRUCTION RECORDS	YCP	JDC		AMA

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99475809

Hastings Utilities
North Denver Station

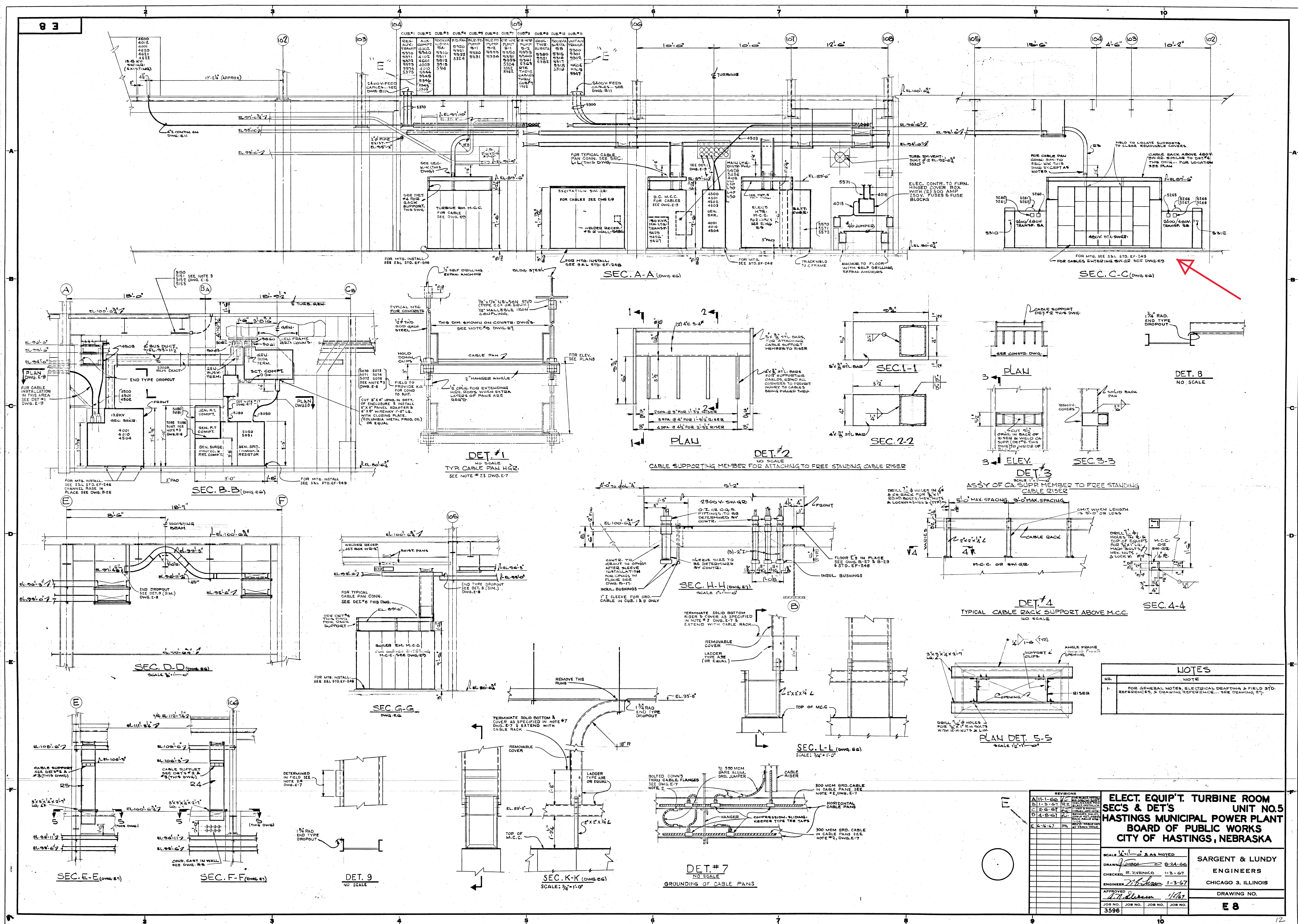
UNIT 5
480V SW. GR.-CUB. 7
WIRING DIAGRAM

Rev. 0

5-E 271

09-05-2000 10:55am - LVL B

ORIGINAL CONSTRUCTION DRAWING



12

ORIGINAL CONSTRUCTION DRAWING

134D249

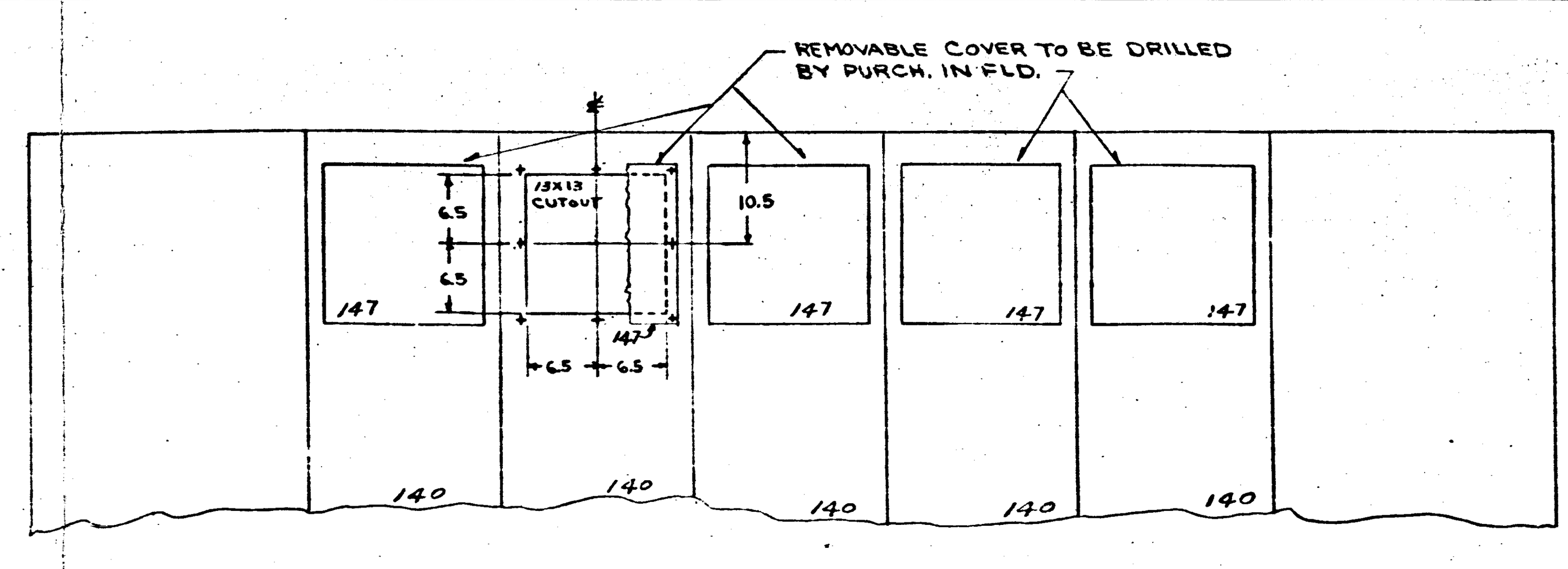
ALUM. BUS & RISERS					
SYM.	SIZE	SYM.	SIZE	SYM.	SIZE
A	1/4 X 6	E	1/4 X 3	I	1/4 X 1-1/2
B	1/4 X 5	F	1/4 X 2-1/2	J	1/4 X 1-1/4
C	1/4 X 4	G	1/4 X 2	K	1/4 X 1
D	1/4 X 3-1/2	H	1/4 X 1-3/4		

NOTE - NUMERICAL SUFFIX ADDED TO BUS SYMBOL INDICATES NO. OF BARS PER PHASE.

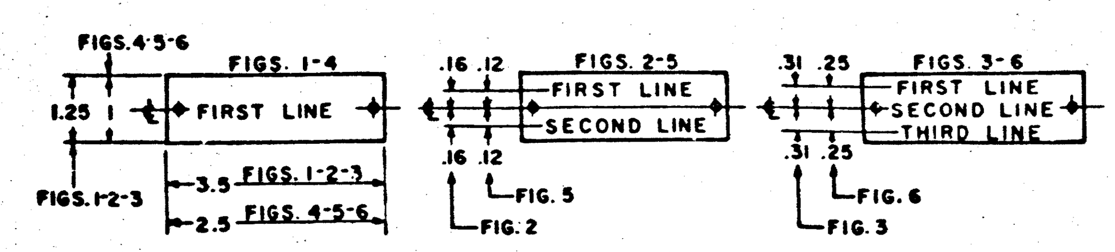
TERMINAL APPLICATION DATA

	MAIN LEADS			NEUTRAL LEADS		
CIRCUIT NO	TERMS PER PH	CABLE SIZE	B. OF M. ITEM	NO. OF TERMS	CABLE SIZE	B. OF M. ITEM
702	1	4/0	103			
703	1	#4	102			
704	1	#6	102			
705	1	4/0	103			
706	1	#2	102			
707	1	1/0	102			
708	1	4/0	103			
709	1	#2	102			
Δ 710						
712	1	#2	102			
713	1	#2	102			
714	1	#2	102			
715	1	4/0	103			
716	1	#2	102			
717	1	4/0	102			
718	1	#6	102			
719	1	#6	102			
720	1	2/0	102			

Δ - FUTURE

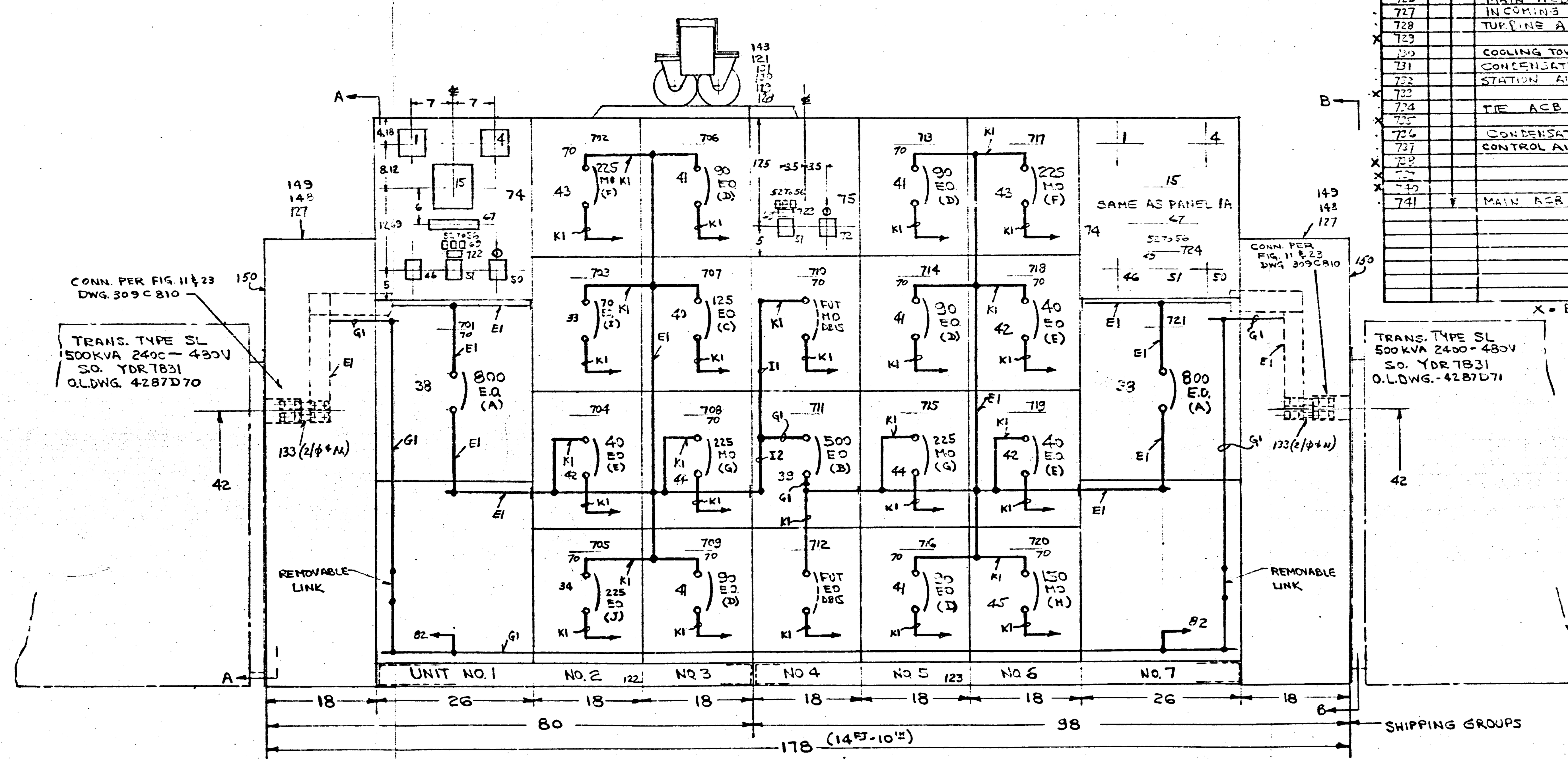


PARTIAL PLAN VIEW



NP IT. NO.	B OF M IT. NO.	FIRST LINE	SECOND LINE	THIRD LINE	LET.	FIG. NO	REQ. NO
701	70	MAIN ACB	480V. BUS 5A		.188	2	1
702		TURBINE ROOM	MCC			2	1
703		TURBINE AUX.	OIL PUMP			2	1
X 704							1
705		COOLING TOWER	EMERG. FEED			2	1
706		CONDENSATE	PUMP 5-1			2	1
707		STATION AIR	COMPRESSOR			2	1
708		LIGHTING	TRANS. 5A			2	1
X 709							1
X 710							1
711		TIE ACB				1	1
X 712							1
713		CONDENSATE	PUMP 5-2			2	1
714		CONTROL AIR	COMPRESSOR			2	1
715		LIGHTING	TRANS. 5B			2	1
X 716							1
717		B.R. MCC				1	1
X 718							1
X 719							1
720		WELDER FEED				1	1
721		MAIN ACB	480V BUS 5B			2	1
722	69	MAIN ACB	480V BUS 5A			5	1
723		TIE				4	1
724		MAIN	480V BUS 5B			5	1
725							
726		MAIN ACB	480V BUS 5A			5	1
727		INCOMING	D.C. SUPPLY			5	1
728		TURBINE AUX.	OIL PUMP			5	1
X 729							1
730		COOLING TOWER	EMERG. FEED			5	1
731		CONDENSATE	PUMP 5-1			5	1
732		STATION AIR	COMPRESSOR			5	1
X 733							1
734		TIE ACB				4	1
X 735							1
736		CONDENSATE	PUMP 5-2			5	1
737		CONTROL AIR	COMPRESSOR			5	1
X 738							1
X 739							1
X 740							1
741		MAIN ACB	480V BUS 5B			5	1

X = BLANK



1	50	24Y4120	6-21-66
2	SO 24Y4120	DWG. WAS FOR CA CHANGES MADE PER CUSTOMER MARKED PRINT.	3-28-66

WESTINGHOUSE ELECTRIC CORPORATION

TITLE HASTINGS UTILITIES HASTINGS NEBRASKA

LOW VOLTAGE METAL ENCLOSED SWGR.

DIMENSIONS IN INCHES—SCALE | ASSEMBLY - FRONT VIEW

ENG. SEC. 134D250 REF. F.P. 135D214 DWG. B-M. 681C006

DFTM. CA 6-21-66 | J. K. Kessler 10-7-1966

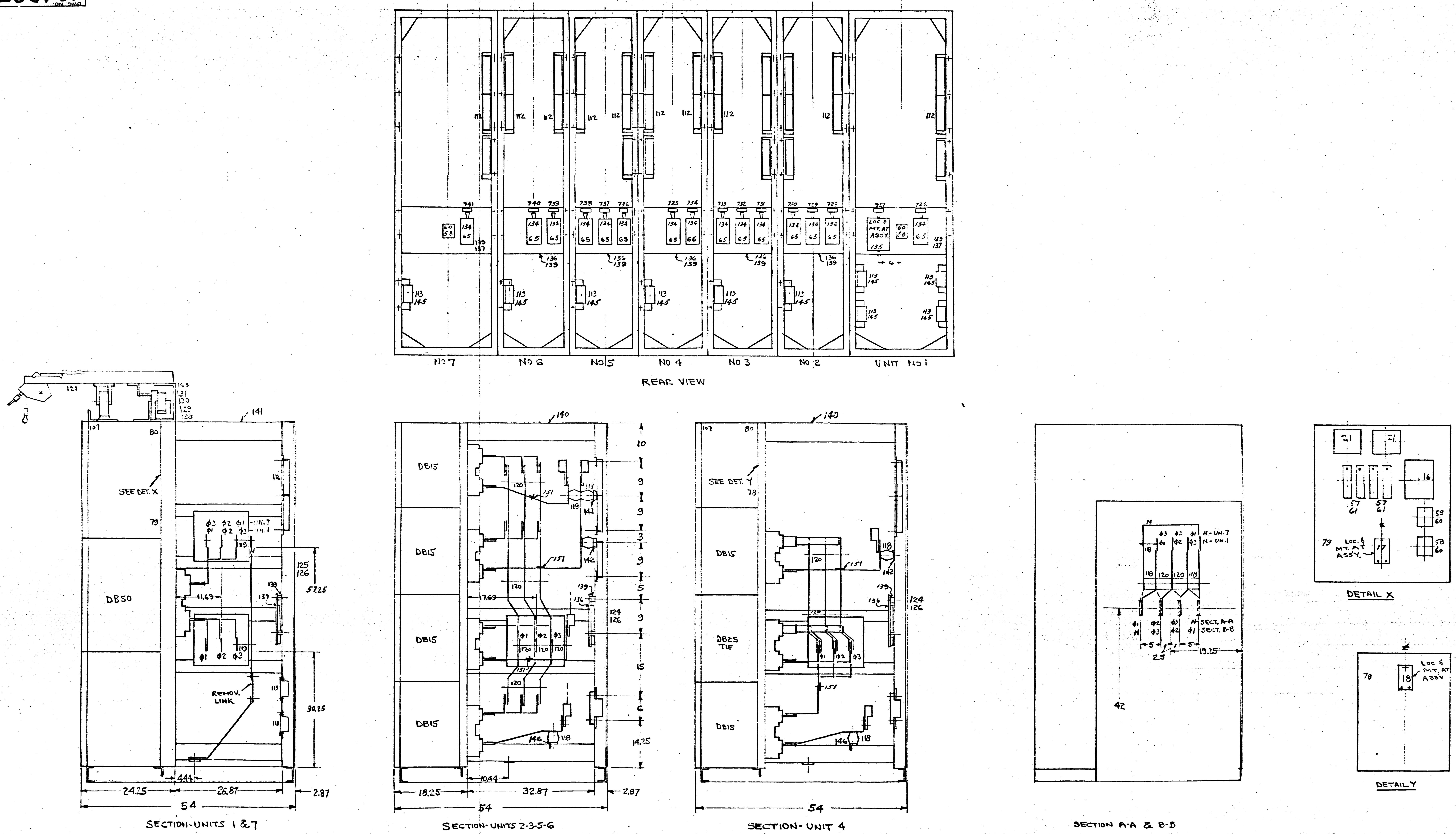
134D249

DIVISION SWGR. PLANT LOCATION EAST PITTSBURGH 6600

FORM 31957 A

ORIGINAL CONSTRUCTION DRAWING

134D250



SO 24Y4120
G.O. OM-12750-UY2
IT. | CHANGE
EP17192
1
SO. 24Y4120 2
DWG WAS FOR C.A.
DWG COMPLETED FOR MFG.
R.L.H. 10-5-66
10-6-66
10-7-66
P17346

FORM 31957 A

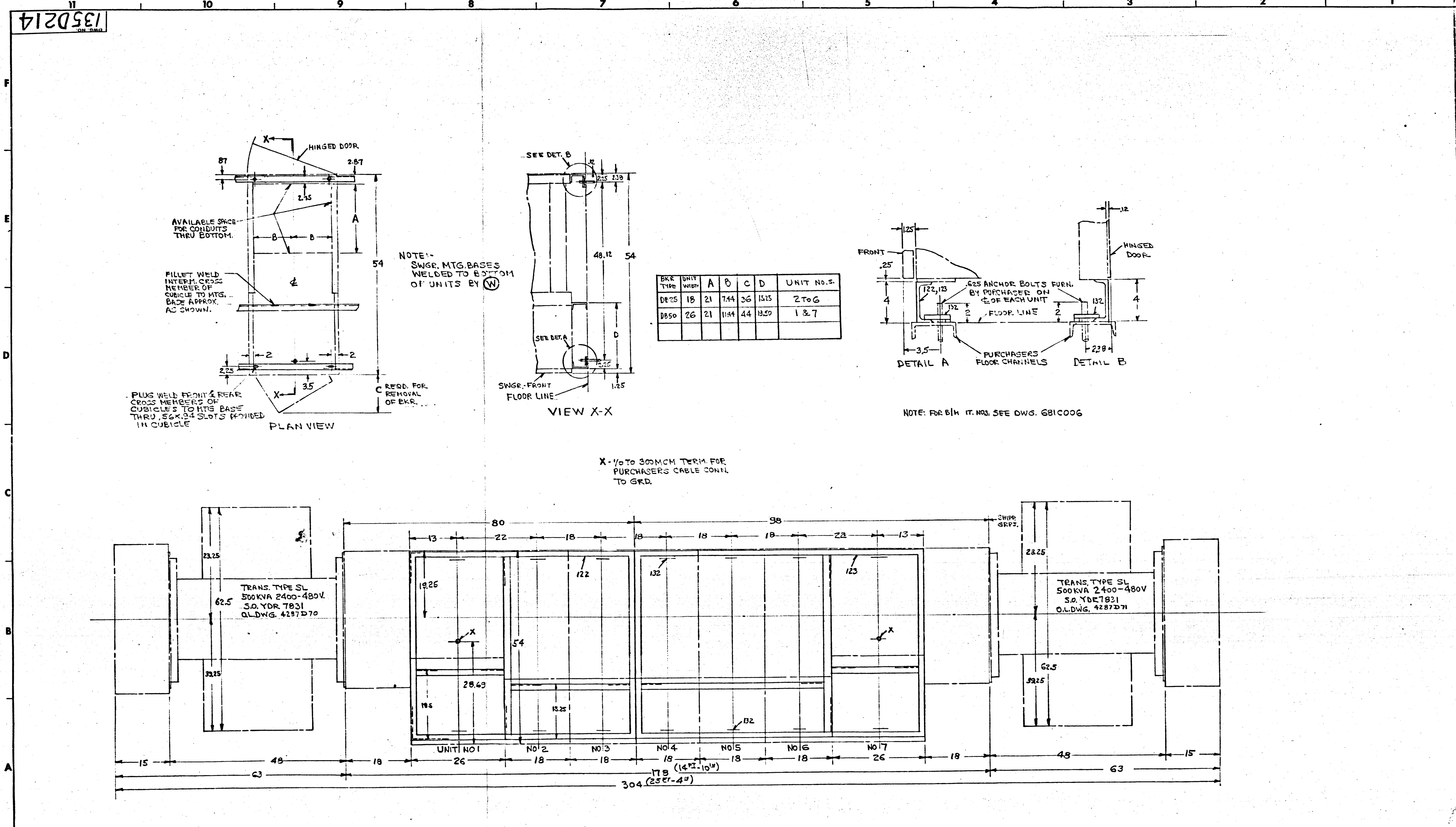
WESTINGHOUSE ELECTRIC CORPORATION

TITLE HASTINGS UTILITIES HASTINGS NEBRASKA
LOW VOLTAGE METAL ENCLOSED SWGR
DIMENSIONS IN INCHES—SCALE | ASSEMBLY- SECTIONS & R. VIEW
DFTSM. CA 6-22-66 | J. K. Hamlen 10-7-1966
ENG. REF. DWG. 134D249 135D214 CBIC006

134D250

DIVISION SWGR PLANT LOCATION EAST PITTSBURGH PA 6600

ORIGINAL CONSTRUCTION DRAWING



BKR TYPE	UNIT WIDTH	A	B	C	D	UNIT NO.S.
DB25	18	21	7.44	36	15.25	2 TO 6
DB50	26	21	11.44	44	19.50	1 & 7

S.O. 24Y4120 — 1 — G.O. DM12750-MG

EP17192 — S.O. 24Y4120 — 2 — TRANS. REF. DWG. ADDED R.L.H. 9-27-66 — EP17140

WESTINGHOUSE ELECTRIC CORPORATION

TITLE HASTINGS UTILITIES HASTINGS NEBRASKA

LOW VOLTAGE METAL ENCLOSED SWGR.

DIMENSIONS IN INCHES—SCALE FLOOR PLAN

DFTMN 6-23-66 J.K. 10-7-1966

ENG. REF. DWG. 1346243-50 681C008

135D214

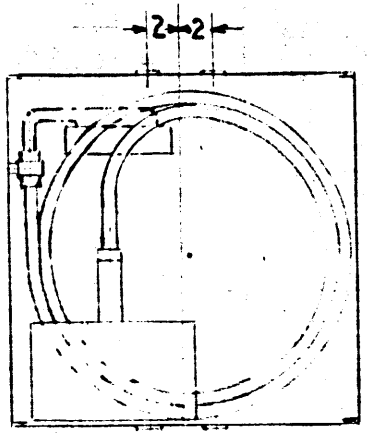
DIVISION SWGR PLANT LOCATION EAST PITTSBURGH, PA. 6600

FORM 31957 A

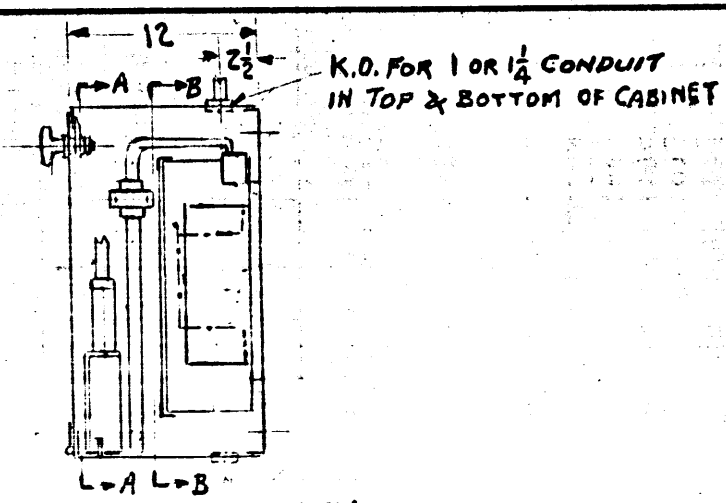
SUB.	S.O. 6-6600
1	D.
6/14/61	K. TUSING
6/14/61	

EP 14075
2 24Y3149
FIGS. 1 & 3 OF VIEW B-B WERE NOT ON ORIG 7-13-45
EP16679

500-A-583



VIEW AA



SECTIONAL SIDE VIEW

VIEW B-B

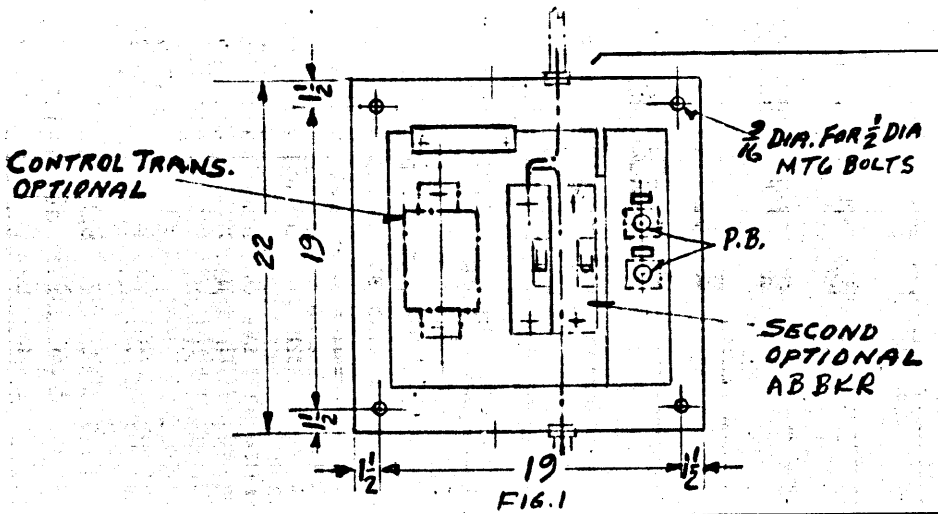


FIG. 1

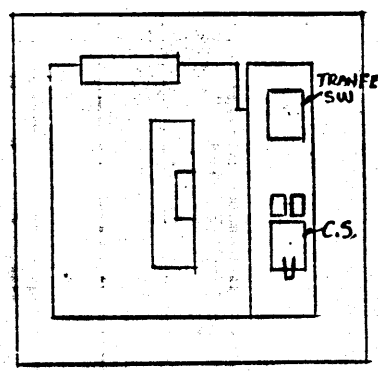


FIG. 2

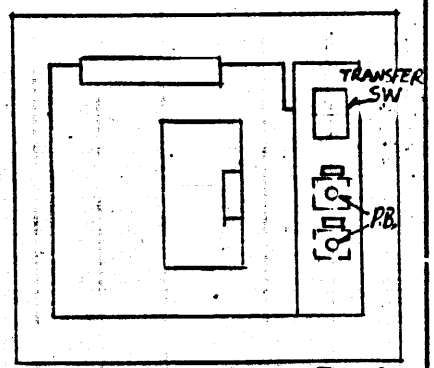


FIG. 3

DWG. . DWG. 500A 613
GEN. ASSY DWG. 310C 307

DIVISION AS&D WESTINGHOUSE ELECTRIC CORPORATION PLANT LOCATION EAST PITTSBURGH PA

TITLE LOW VOLTAGE METAL ENCLOSED SWGR.-TEST CABINET OUTLINE ASS'Y.-DIM. IN INCHES N T S

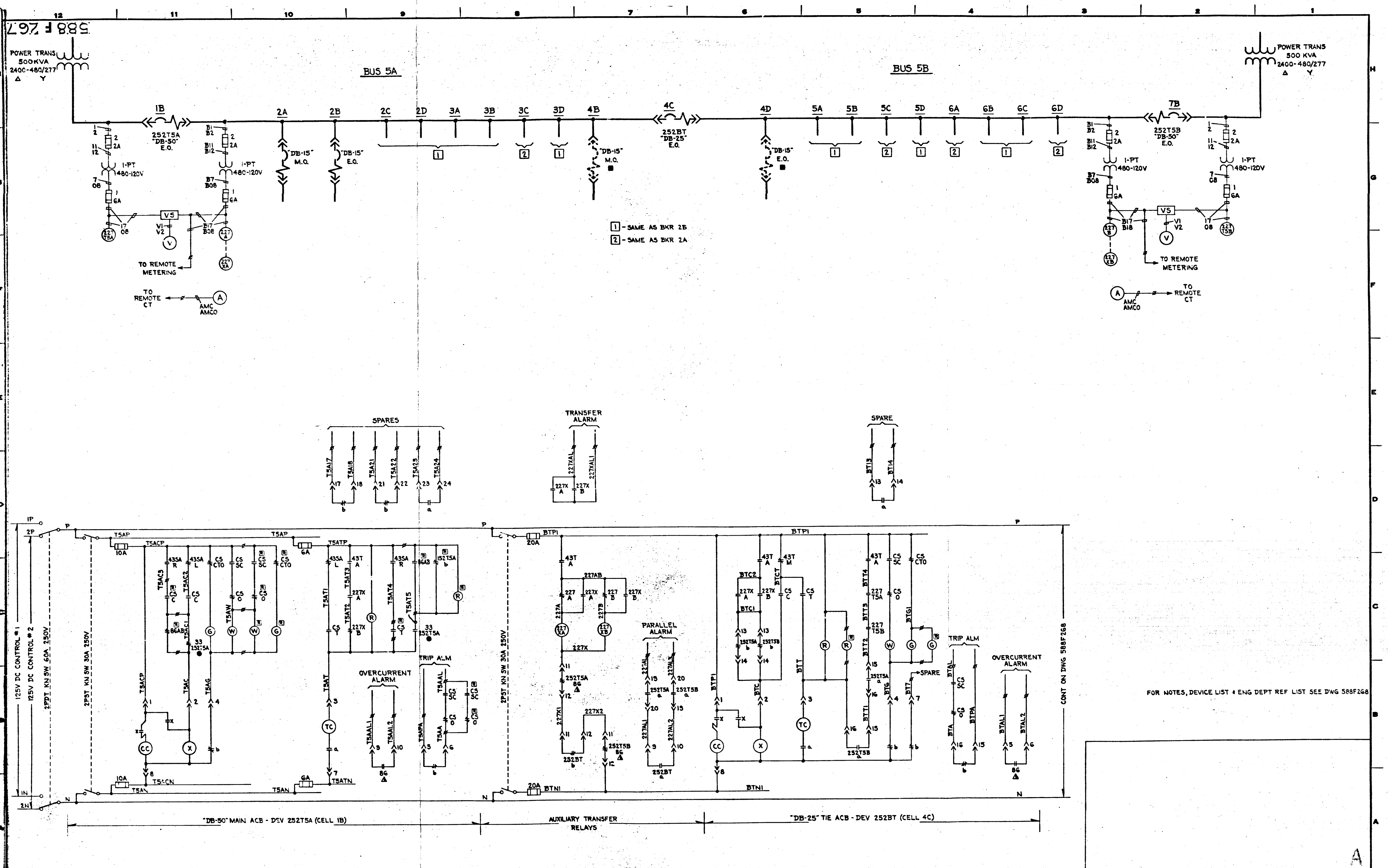
SUB. 1

50-0A583

6600

FORM 31950

ORIGINAL CONSTRUCTION DRAWING



NOTE TO CUSTOMER

MATERIAL SUPPLIED BY WESTINGHOUSE ELECTRIC CORPORATION IS ACCORDING TO CONTRACT AND NOT MODIFIED BY ANYTHING SHOWN ON THIS DIAGRAM. LOCATION OF APPARATUS, WIRES OR CABLES MUST NOT BE DETERMINED FROM DIAGRAM.

PANEL CONNECTIONS SHOWN AS VIEWED FROM REAR EXCEPT AS NOTED. AUXILIARY SWITCHES AND CONTACTS SHOWN FOR OPEN, OFF OR DE-ENERGIZED POSITION OF MAIN DEVICES.

CURRENT AND POTENTIAL TRANSFORMER SYMBOLS SHOW TERMINALS OF THE SAME INSTANTANEOUS POLARITY AS INDICATED AT THE RIGHT.

CONNECTIONS ARE FOR PHASE ROTATION 1-2-3.

ALL CONNECTIONS MADE WITH #14 STRANDED WIRE. EXCEPT AS INDICATED.

WESTINGHOUSE ELECTRIC CORPORATION	
TITLE HASTINGS UTILITIES	HASTINGS, NEBRASKA
LVME SWGR	
480V 3Ø 60~	ONE LINE & SCHEMATIC
DFTM. GCKUNDRICK	588F267
DIVISION SWGR	PLANT LOCATION EAST PITTSBURGH, PA 16300

FORM 2A35-8

ORIGINAL CONSTRUCTION DRAWING

588F268

NOTES:

▲ — ALARM SWITCH CONTACTS OPERATE, WHEN BREAKER IS TRIPPED AUTOMATICALLY BY ONE OF THE FOLLOWING ATTACHMENTS, SERIES OVERLOADS, UNDERVOLTAGE, OR REVERSE CURRENT TRIP. CONTACTS DO NOT OPERATE WHEN BREAKER IS TRIPPED MANUALLY OR BY THE SHUNT TRIP.
CONTACTS SHOWN IN THE RESET POSITION.

● — CELL SWITCH SHOWN WITH BREAKER IN TEST OR WITHDRAWN POSITION.

ø — TERMINAL POINT FOR REMOTE CONNECTIONS.

Ⓡ — REMOTE EQUIPMENT

■ — FUTURE EQUIPMENT

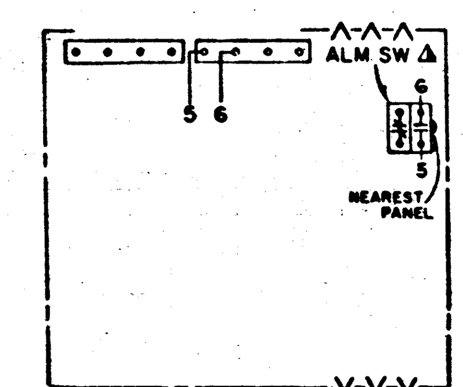


FIG-4 CONN DIAG (FV) "DB-15" MAN. OPR.

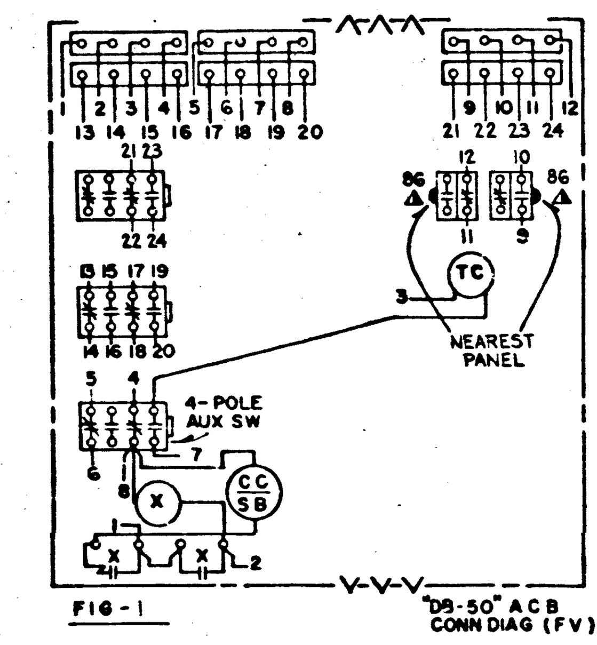


FIG-1 "DB-50" ACB CONN DIAG (FV)

"DB" BREAKER
OPERATION SEQUENCE

1. CONTROL SWITCH CS-C CLOSED.
2. "X" RELAY PICKS UP & SEALS IN THRU AUX. CONTACT "X".
3. CLOSING COIL ENERGIZED THRU "X" CONTACT, CLOSING BREAKER.
4. IN CLOSING, BKR. CLOSING MECH. MECHANICALLY UNLATCHES "X" CONTACTS FREE OF "X" ARMATURE INTERRUPTING CLOSING CIRCUIT.
5. WITH BREAKER IN CLOSED POSITION, THE BREAKER MECH. IS LATCHED CLOSED BUT "X" CONTACTS REMAIN UNLATCHED FROM "X" ARMATURE.
6. WHEN BKR. IS TRIPPED, CLOSING MECH. DROPS, PERMITTING "X" LATCH TO RESET PROVIDED "X" COIL IS DE-ENERGIZED.

CC - CLOSING COIL
TC - TRIPPING COIL
X - CONTROL RELAY

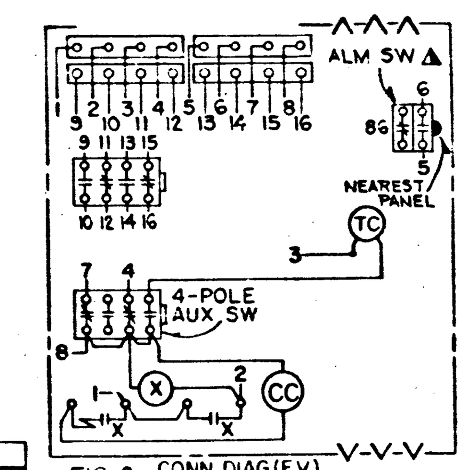


FIG-2 CONN DIAG (FV) "DB-25" ACB

LIST OF APPARATUS

	IDENT	TYPE	DESCRIPTION
	CS	W-2	CONTROL SWITCH
	VS	W-2	VOLTMETER SWITCH
	V	KA 241	VOLTMETER
	A	KA 241	AMMETER
	227 A/B	CV-7	UNDERVOLTAGE RELAY
	227T5 A/B	SG	UNDERVOLTAGE RELAY
	227X A/B	MG-6	AUX TO DEVICE 227 A/B
●	33		CELL SWITCH
	43S A/B	W-2	CONTROL SELECTOR SWITCH
	43T	W-2	TRANSFER SWITCH
	252T5 A/B	DB-50	MAIN AIR CKT BKR
	252BT	DB-25	TIE AIR CKT BKR
	74	SG	ALARM RELAY FOR POWER FAILURE
▲	86		ALM SW USED FOR OVERCURRENT LOCKOUT

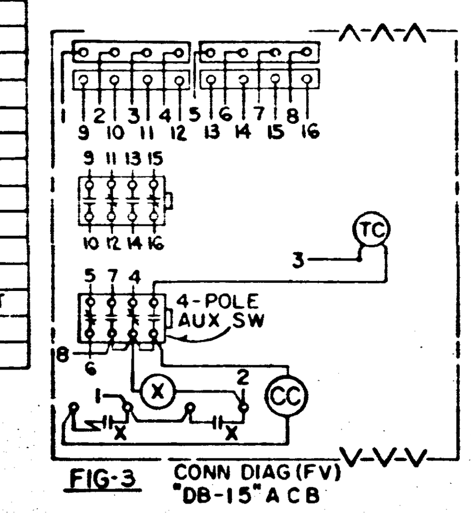
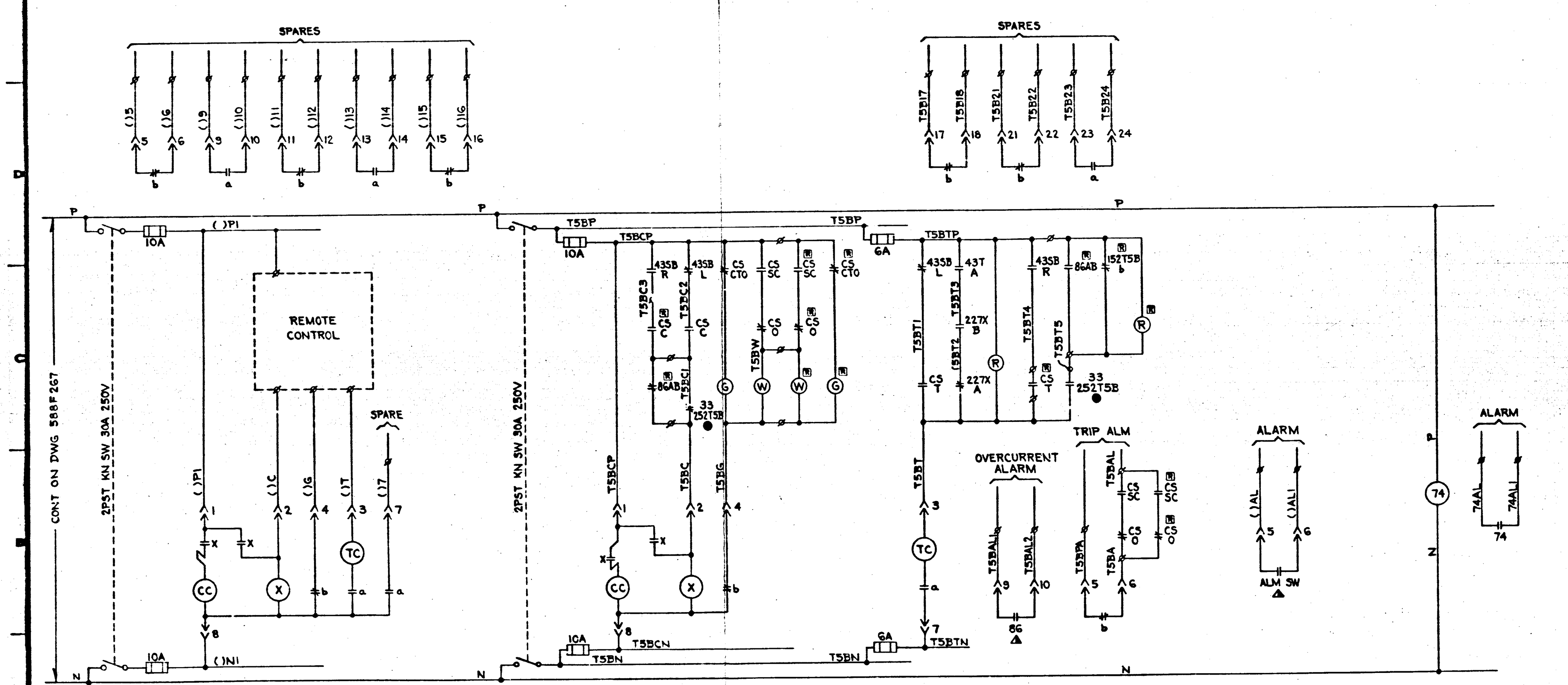


FIG-3 CONN DIAG (FV) "DB-15" ACB

DWG REF LIST —

FRONT VIEW ____ DWG 134D249
SECTIONS ____ DWG 134D250
BILL / MTL ____ DWG 681C006
FLOOR PLAN ____ DWG 135D214
NP CHART ____ DWG 134D249
ONE LINE & SCHEMATIC DWG 588F267
CONN DIAG (UNIT 1) DWG 588F269
CONN DIAG (UNIT 2-3) DWG 588F270
CONN DIAG (UNIT 4) DWG 588F271
CONN DIAG (UNIT 5-6) DWG 588F272
CONN DIAG (UNIT 7) DWG 588F273



"DB-15" FEEDER ACB
CELLS 2B, 2C, 2D, 3A, 3B, 3D, 4D-FUT, 5A, 5B, 5D, 6E & 6C
( )-USE CELL NO. FOR WIRE PREFIX

"DB-50" MAIN ACB - DEV 252T5B (CELL 7B)

"DB-15" M.O. FEEDER ACB
CELLS 2A, 3C, 4B-FUT, 5C & 6A
( )-USE CELL NO. FOR WIRE PREFIX

ALARM RELAY FOR POWER FAILURE

NOTE TO CUSTOMER

MATERIAL SUPPLIED BY WESTINGHOUSE ELECTRIC CORPORATION IS ACCORDING TO CONTRACT AND NOT MODIFIED BY ANYTHING SHOWN ON THIS DIAGRAM. LOCATION OF APPARATUS, WIRES OR CABLES MUST NOT BE DETERMINED FROM DIAGRAM.

PANEL CONNECTIONS SHOWN AS VIEWED FROM REAR EXCEPT AS NOTED. AUXILIARY SWITCHES AND CONTACTS SHOWN FOR OPEN, OFF OR DE-ENERGIZED POSITION OF MAIN DEVICES.

CURRENT AND POTENTIAL TRANSFORMER SYMBOLS SHOW TERMINALS OF THE SAME INSTANTANEOUS POLARITY AS INDICATED AT THE RIGHT.

CONNECTIONS ARE FOR PHASE ROTATION 1-2-3.

ALL CONNECTIONS MADE WITH #14 STRANDED WIRE. EXCEPT AS INDICATED.

WESTINGHOUSE ELECTRIC CORPORATION

TITLE HASTINGS UTILITIES — HASTINGS, NEBRASKA
LVME SWGR
480V 3ø 60~ — SCHEMATIC
DFTM. G.C. KUNDRICK
588F268
DIVISION SWGR — PLANT LOCATION EAST PITTSBURGH, PA — 3300
FORM 2A35-B

588F 269

HINGE PANEL (RV)

UNIT 1 (FV)

BUS COMPT (FV)

PWR TRANS

NEAREST FRONT

CONTROL AND INSTRUMENT SWITCHES
CONTACTS ARE CLOSED FOR POSITION INDICATED
CONTACTS MARKED C1,A1,A2,E1, ETC. ARE CLOSED IN CLOSE, TRIP, RAISE, LOWER, OFF, 1, 2, 3, POSITION RESPECTIVELY.
CONTACT 3C CLOSES WHEN HANDLE IS TURNED TO CLOSE POSITION AND REMAINS CLOSED UNTIL 1-2 HOLE IS TURNED TO TRIP POSITION.

TYPE CV-7 DEV 227A

2-PT's 480-120V

19-0179W PDS 6201-4

DEV 227X-A

DEV 227T5A

DEV 252T5A CELL 13

SEE FIG 1 DIAG 588F268

2PST KN SW 30A 250V

2PDT KN SW 60A 250V

REMOVABLE LINK

GRD BUS

CONTINUED ON DIAG 588F270

NOTES:
♦ - MOUNTED IN REAR
● - CELL SWITCH SHOWN WITH BREAKER IN TEST OR WITHDRAWN POSITION.

ENG DEPT REF - 588F268

NOTE TO CUSTOMER
MATERIAL SUPPLIED BY WESTINGHOUSE ELECTRIC CORPORATION IS ACCORDING TO CONTRACT AND NOT MODIFIED BY ANYTHING SHOWN ON THIS DIAGRAM. LOCATION OF APPARATUS, WIRES OR CABLES MUST NOT BE DETERMINED FROM DIAGRAM.
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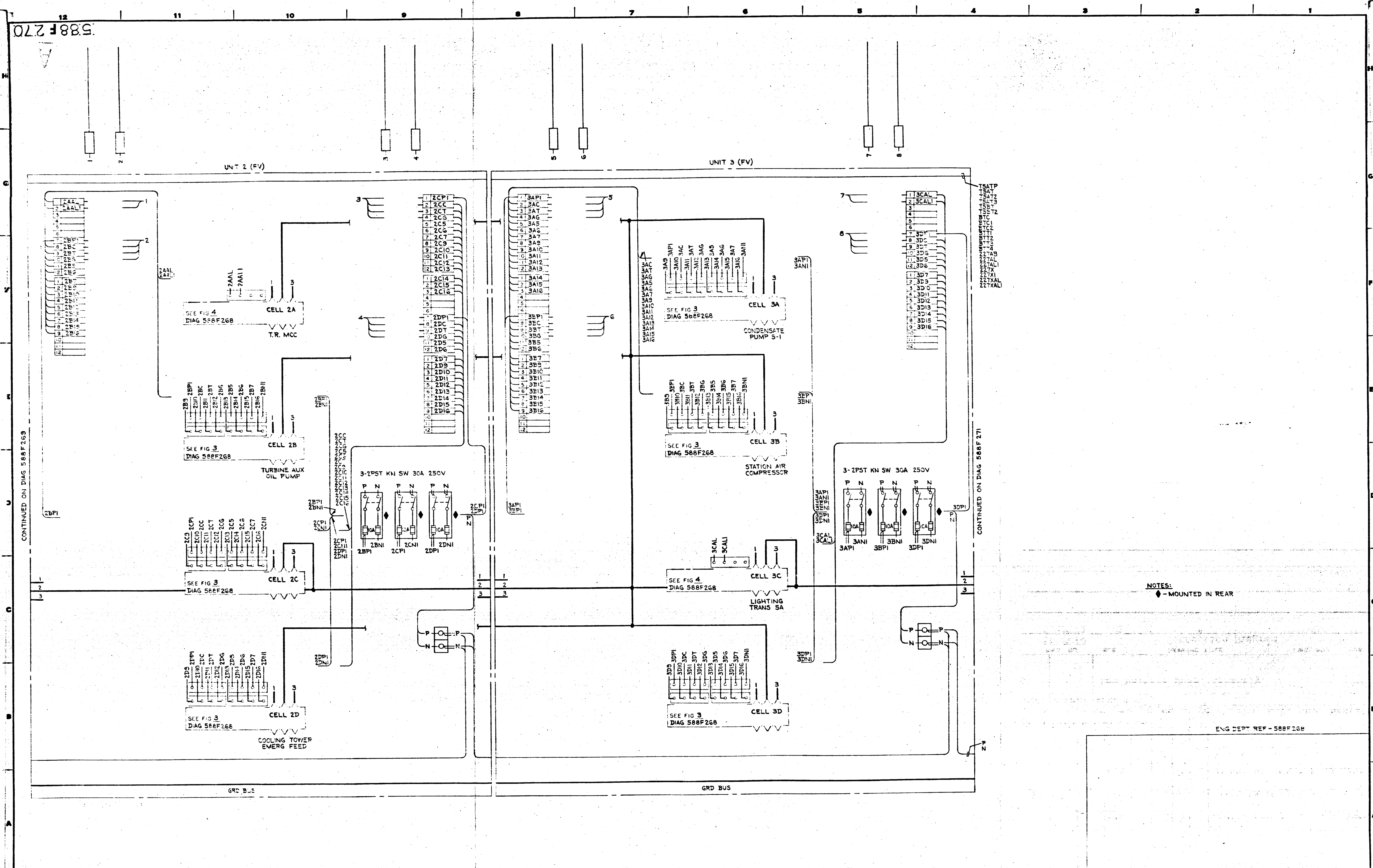
CONNECTIONS ARE FOR PHASE ROTATION 1-2-3.
ALL CONNECTIONS MADE WITH #14 STRANDED WIRE. EXCEPT AS INDICATED.

WESTINGHOUSE ELECTRIC CORPORATION
TITLE HASTINGS UTILITIES — HASTINGS NEBRASKA
LVME SWGR
480V SP 60M
CONN DIAG
DPTM. G.C. KUNDRICK
588F269
DIVISION SWGR
PLANT LOCATION EAST PITTSBURGH, PA
FORM 2A35-8

ORIGINAL CONSTRUCTION DRAWING



NOTE TO CUSTOMER

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CURRENT AND POTENTIAL TRANSFORMER SYMBOLS SHOW TERMINALS OF THE SAME INSTANTANEOUS POLARITY AS INDICATED AT THE RIGHT.

CONNECTIONS ARE FOR PHASE ROTATION 1-2-3.

ALL CONNECTIONS MADE WITH #14 STRANDED WIRE. EXCEPT AS INDICATED.

WESTINGHOUSE ELECTRIC CORPORATION

TITLE HASTINGS UTILITIES HASTINGS NEBRASKA
LVME SWGR
480V 3Ø 60~ CONN DIAG UNITS 2-3

DFTM. GC KENDRICK

588F270

DIVISION SWGR PLANT LOCATION EAST PITTSBURGH, PA.

FORM 2A35-8

588F271

TAG & COIL THESE WIRES IN UNIT 3 FOR SHIPPING

HINGE PANEL (RV)

UNIT 4 (FV)

1 2 3 4 5 6 7 8

BTPI BTC BTC2 BTT BTT4 BTG BTGI BTA BTAL 227AB TSATP TSAT3 T5BTP T5BT3

A11 BTPI B1 227AB B12 BTCT B11 BTC2 C12 T5ATP D12 T5AT3 B7 BTT4 C6 T5BTP D6 T5BT3

43T

R W G BTG BTPI

A1 BTC A12 A11 BTT B1 BTCT B12 B11 BTGI F1 F12 A6 BTA B6 C6 C7 BTAL D6 D7 BTPI

CS 252BT

1 TSATP 2 TSAT3 3 227AB 4 BTC2 5 BTT4 6 BTC 7 TSAT 8 TSAT2 9 T5BT 10 T5BT2 11 BTCI 12 BTT1

1 BTT2 2 BTT3 3 227X 4 227XAL 5 227AL1 6 227AL 7 227ALI 8 227XI 9 10 11 12

227X2 227AL2 BTNI

74AL 74ALI

1 74AL 2 74ALI 3 227XAL 4 227XALI 5 227AL 6 227AL3 7 4BAL 8 4BALI 9 BTPI 10 BTT 11 BTG 12 BTGI

BTT 227AL3

TSAT TSAT2 T5BTP T5BT T5BT2 T5BT3 BTC BTCI BTC2 BTT BTT1 BTT2 BTT3 227AB 227AL2 227AL3 227X 227X2 227XAL BTNI

1 BTAL1 2 BTAL2 3 BTPA 4 BTAL 5 BT7 6 BT13 7 BT14 8 9 10 4DPI 11 4DC 12 4DT

1 4DG 2 4DS 3 4DG 4 4D7 5 4D9 6 4D10 7 4D11 8 4D12 9 4D13 10 4D14 11 4D15 12 4D16

74AL 74ALI

DEV 74

4BAL 4BALI

SEE FIG 4 DIAG 588F268

CELL 4B (FUT)

2-2PST KN SW 30A 250V

BTPI BTT BTG BTA

BTPI BTT1 4DPI 4DNI

BTPI BTNI

227X2 227AL2 BTNI

BTPI BTT BTG BTAL1 BTAL2 BT7 BT13 BT14 BTPA

20A BTNI BTPI

6A 4DNI 4DPI

BTPI 4DPI

BTC 227XI 227ALI

SEE FIG 2 DIAG 588F268

DEV 252BT

CELL 4C

227ALI 227AL2 BTPI 227XI BTC BTT 227X2 BTG BT13 BTAL1 BT14 BTAL2 BTPA BT7 BTA BTNI

4DPI 4DNI

4D9 4DNO 4DC 4DI 4DT 4DI2 4DG 4DI3 4DS 4DI4 4D6 4DI5 4D7 4DI6 4DNI

SEE FIG 3 DIAG 588F268

CELL 4D (FUT)

TAG & COIL THESE WIRES IN UNIT 3 FOR SHIPPING

GRD BUS

CONTINUED ON DIAG 588F270

"W-2" 43T

CTO SC ST

"W-2" CS

CONTINUED ON DIAG 588F272

CONTROL AND INSTRUMENT SWITCHES

CONTACTS ARE CLOSED FOR POSITION INDICATED
CONTACTS MARKED C7 F2, A1 E3, ETC. ARE CLOSED IN CLOSE, TRIP, RAISE, LOWER, OFF, 1, 2, 3, POSITION RESPECTIVELY.
CONTACT SC CLOSES WHEN HANDLE IS TURNED TO CLOSE POSITION AND REMAINS CLOSED UNTIL HANDLE IS TURNED TO TRIP POSITION.

NOTES:
♦ – MOUNTED IN REAR

ENG DEPT REF-588F268

1	EP 1 72 78	CHANGE	

NOTE TO CUSTOMER
MATERIAL SUPPLIED BY WESTINGHOUSE ELECTRIC CORPORATION IS ACCORDING TO CONTRACT AND NOT MODIFIED BY ANYTHING SHOWN ON THIS DIAGRAM. LOCATION OF APPARATUS, WIRES OR CABLES MUST NOT BE DETERMINED FROM DIAGRAM.
PANEL CONNECTIONS SHOWN AS VIEWED FROM REAR EXCEPT AS NOTED. AUXILIARY SWITCHES AND CONTACTS SHOWN FOR OPEN, OFF OR DE-ENERGIZED POSITION OF MAIN DEVICES.
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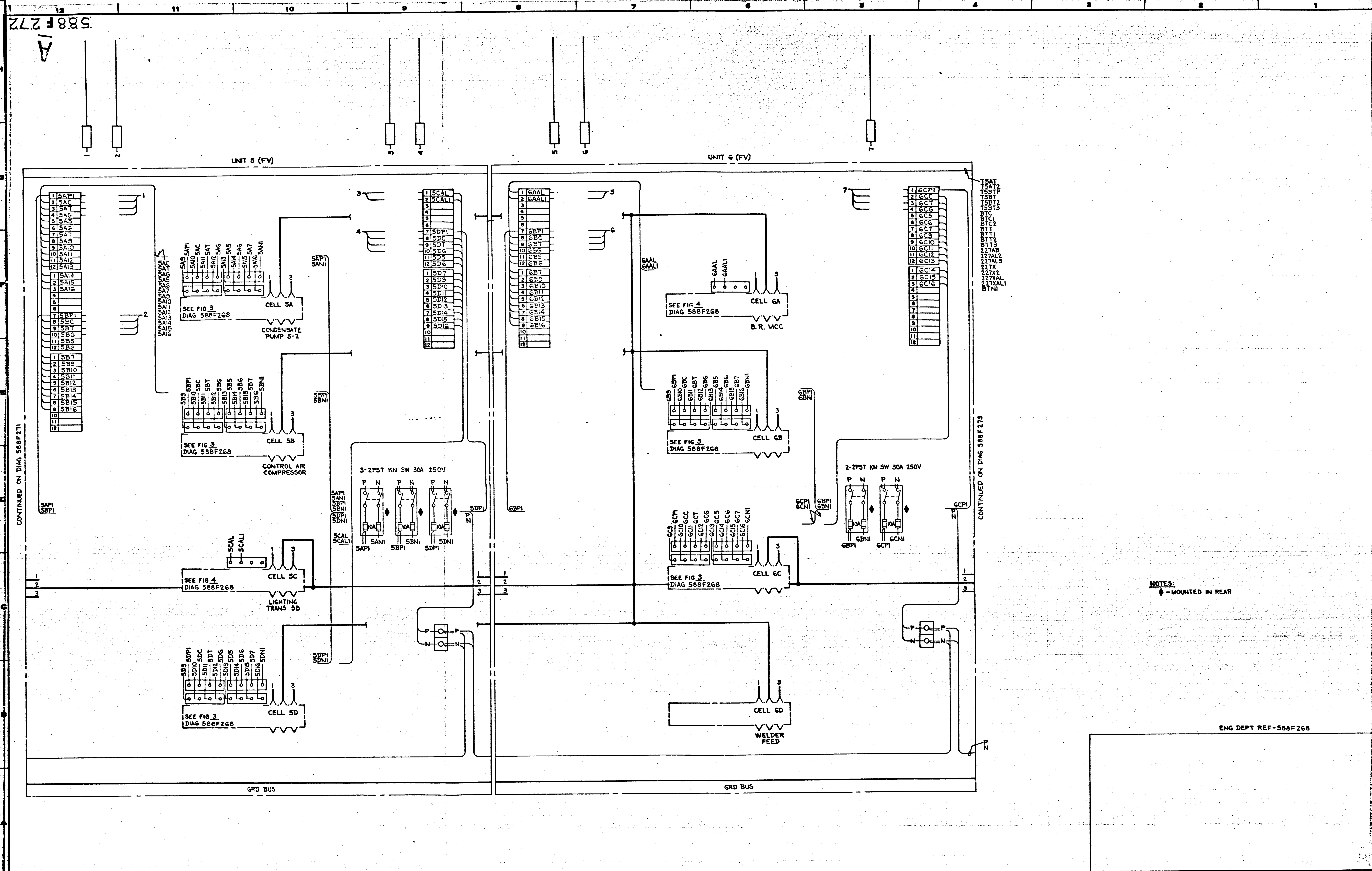
CONNECTIONS ARE FOR PHASE ROTATION 1-2-3.
ALL CONNECTIONS MADE WITH #14 STRANDED WIRE. EXCEPT AS INDICATED.

WESTINGHOUSE ELECTRIC CORPORATION

TITLE HASTINGS UTILITIES — HASTINGS, NEBRASKA
LVME 5.5GR
480V 3Ø 60~ — CONN DIAG UN 4
DRFTR. SC KUNDRICK
588F271
DIVISION SWGR — PLANT LOCATION EAST PITTSBURGH, PA

FORM 2A35-8

ORIGINAL CONSTRUCTION DRAWING



NOTES:
♦ – MOUNTED IN REAR

ENG DEPT REF – 588F268

NOTE TO CUSTOMER

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PANEL CONNECTIONS SHOWN AS VIEWED FROM REAR EXCEPT AS NOTED. AUXILIARY SWITCHES AND CONTACTS SHOWN FOR OPEN, OFF OR DE-ENERGIZED POSITION OF MAIN DEVICES.

CURRENT AND POTENTIAL TRANSFORMER SYMBOLS SHOW TERMINALS OF THE SAME INSTANTANEOUS POLARITY AS INDICATED AT THE RIGHT.

CONNECTIONS ARE FOR PHASE ROTATION 1-2-3.

ALL CONNECTIONS MADE WITH #14 STRANDED WIRE. EXCEPT AS INDICATED.

WESTINGHOUSE ELECTRIC CORPORATION

TITLE HASTINGS UTILITIES	HASTINGS, NEBRASKA	
LVME SWGR		
480V 3Ø 60~	CONN DIAG	UN'S 5-6
DFTM. G.C. KUNDRICK		588 F 272
DIVISION SWGR	PLANT LOCATION EAST PITTSBURGH, PA	6300

FORM 2A35-

588F273

HINGE PANEL (RV)

UNIT 7 (FV)

BUS COMPT (FV)

NEAREST FRONT

PWR TRANS

2-PT's 480-120V

19-0179W POS 6201-4

DEV 227X-B

DEV 227T5B

DEV 252T5B

CELL 7B

SEE FIG 1 DIAG 588F268

435-B

252T5B

CS

CONTROL AND INSTRUMENT SWITCHES

CONTACTS ARE CLOSED FOR POSITION INDICATED. CONTACTS MARKED C-F, L-R, I-O, ETC. ARE CLOSED IN CLOSE, TRIP, B/SK, LOWER, O/F, T, R, POSITION RESPECTIVELY.
CONTACT BK CLOSES WHEN HANDLE IS TURNED TO CLOSE POSITION AND REMAINS CLOSED UNTIL HANDLE IS TURNED TO TRIP POSITION.

TYPE CV-7 DEV 227B

2PST KN SW 30A 250V

REMOVABLE LINK

33 252T5B

NOTES:
♦ - MOUNTED IN REAR
● - CELL SWITCH SHOWN WITH BREAKER IN TEST OR WITHDRAWN POSITION.

ENG DEPT REF-588F268

CONTINUED ON DIAG 588F272

GRD BUS

NOTE TO CUSTOMER
MATERIAL SUPPLIED BY WESTINGHOUSE ELECTRIC CORPORATION IS ACCORDING TO CONTRACT AND NOT MODIFIED BY ANYTHING SHOWN ON THIS DIAGRAM. LOCATION OF APPARATUS, WIRES OR CABLES MUST NOT BE DETERMINED FROM DIAGRAM.
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ALL CONNECTIONS MADE WITH #14 STRANDED WIRE, EXCEPT AS INDICATED.

WESTINGHOUSE ELECTRIC CORPORATION
TITLE HASTINGS UTILITIES — HASTINGS, NEBRASKA
LVME SWGR
480V 3Ø 60~ — CONN DIAG UN 7
DFTM GC KUNDRICK
588F273
DIVISION SWGR — PLANT LOCATION EAST PITTSBURGH, PA. 15000
FORM 2A35-B

2nd Revision
24Y4126
0M12750 UY2
CHANGES
EP 12 78

INST. PNL. REAR VIEW — STRUCT #2 FRONT VIEW

	A	B	C	D	E
1	0-800A (8E) AM1 AM2 (8E) A.M. 1A	0-600V (5B) V2 V1 (5B) V.M. 1B	L1 (4C) L3 (4C) PXA-10 480/120V (8D) VL7 (5B) L9 (3C) 2C	E1 (4E) E3 (4E) PXA-10 480/120V (8D) VE7 (3B) E9 (3E) 2E	
2	ICS CV CV-2 RELAY				
3	(8E) CV2 CV1 (8E) (2E) VE7 VE9 (3E) (5B) (5B) 3B		L9 (2C) N.E.C. 6A 250V (5B) VL9 3C	E9 (2E) N.E.C. 6A 250V (3B) VE9 3E	
4	R W G (8E) C T (8E) P (8E) L (8E) A1 A2 A3 A4 A5 A6 A7 A8 B1 B2 B3 B4 B5 B6 B7 ST SC BKR. CONT. SW. S# 505A714G01 5A	V.M. SW. VL9 (2C) VE9 (3B) (1B) V1 V2 (1B) VE7 (3B) VL7 (2C) 5B	L1 (6D) L3 (6D) C.L.F. 3A 600V (2C) L11 (2C) L13 4C	E1 (6D) E3 (6D) C.L.F 3A 600V (2E) E11 (8E) E13 4E	
5			AX1 AX2 AX3 AX4 AX5 AX6 AX7 AX8 (8E) 1 2 3 4 5 6 7 8 15 16 SEE FIG 1. DB 25 DO/MO		
6	NOTE: 1. ALL WIRE # 14 #1/.010 PDS 62411-GF UNLESS NOTED OTHERWISE		φ1 φ2 φ3 L1 (4C) L3 (4C) #12 19/0179 PDS 6201-4 E1 (4E) E3 (4E) 6D	TERM. BLK MTD ON REAR FRAME	
7			AX9 AX10 AX11 AX12 AX13 AX14 AS1 AX15 AS2 AX16 (8E) 1 2 3 4 5 6 7 8 9 10 11 12 SEE FIG 1. DB 25 DO/MO 7D	(5A) P (5A) C (5A) L (1A) AM1 (1A) AM2 (3B) CV1 (3B) CV2 (6D) AX1 (6D) AX2 (6D) AX3 (6D) AX4 (6D) AX5 (6D) AX6 (6D) AX7 (6D) AX8 (7D) AX9 (7D) AX10 (7D) AX11 (7D) AX12 (7D) AX13 (7D) AX14 (7D) AX15 (7D) AX16 (7D) AS1 (7D) AS2 (7D) AS3 (6D) AS4 8E	CUST. CONN. FOR REMOTE DEVICES
8			(2C) VL7 (2E) VE7 GRD BUS 8D		

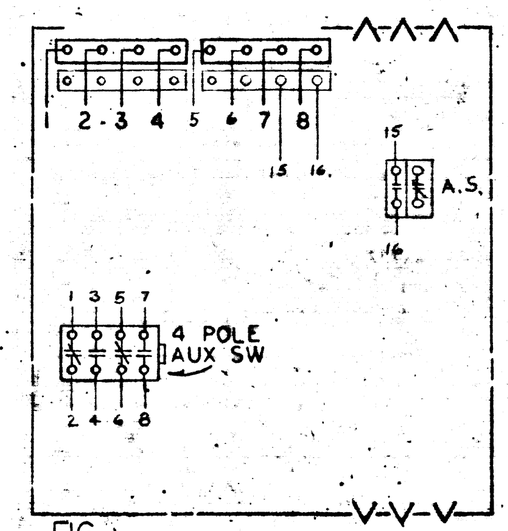


FIG. 1. DB-25 A.C.B. DO/MO

NOTE: 1. ALL WIRE # 14 #1/.010 PDS 62411-GF UNLESS NOTED OTHERWISE

SO OMEA 13325 D IT. 1A

IT.	CHANGE
1	

ENG. LAYOUT-CG-55D418 REF. DWG.

WESTINGHOUSE ELECTRIC CORPORATION

TITLE HASTINGS MUNICIPAL POWER PLANT-HASTINGS, NEB
LOW VOLTAGE SWGR
DIMENSIONS IN INCHES—SCALE ~ | WIRING DIAGRAM

DFTM. T. JACK	12-27-66			CG55C253
Scott	12/28/66			

DIVISION PLANT LOCATION

FORM 31055

ORIGINAL CONSTRUCTION DRAWING

REV	DESCRIPTION	BY	DATE	REV	DESCRIPTION	BY	DATE	REV	DESCRIPTION	BY	DATE
A	ADDED CONTACTS TO PRD & LEVEL GAUGE, REMOVED CONTROL BOX, CORRECTED STUDS.	BB	11/20/13								

	DESCRIPTION
1	LV BUSHING W/4 HOLE SPADE
4	HV BUSHING W/2 HOLE G SPADE
7	NAMEPLATES
8	RADIATOR
10	BOLTED HANDHOLE COVER
11	COVER LIFTING LUG
12	LIFTING LUG W/PULLING EYE
13	JACKING PROV. W/PULLING EYE
14	2 HOLE HORIZ NEMA GRD PAD
15	1 IN DRAIN VALVE AND SAMPLER
46	PRD/Q 208-60F W/CONTACTS
47	PRV VIAT 30206001N KRYTOX
48	THERMOMETER W/2 CONTACTS
49	4" MAG LL GAUGE W/CONTACTS
50	OIL LEVEL PLUG
51	TAP CHANGER HANDLE
52	1" UPPER FILTER VALVE
57	PRES VAC GAUGE W/PV REGULATOR
62	NITROGEN TEST-SCHRADER VALVE
64	2 INCH BALL VALVE
98	3/8" X 1" STUDS WELDED TO TANK FOR ATTACHING SHROUD
99	CENTER OF GRAVITY

APPROVAL DRAWING

PLEASE INDICATE BY SIGNING

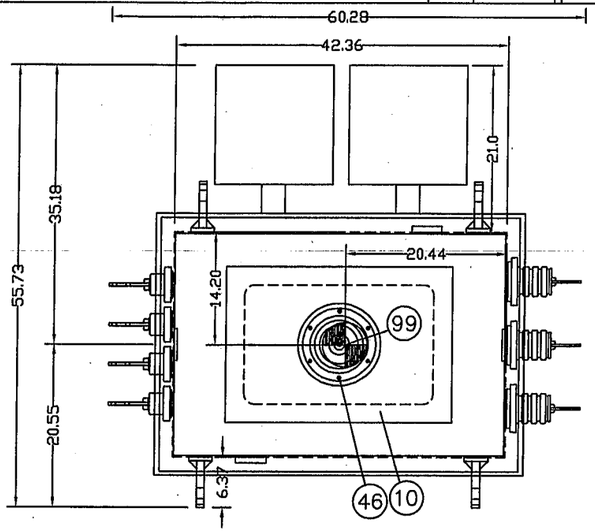
APPROVED_____ DATE_____

THIS DRAWING REPERESENTS THE TRANSFORMER COVERED BY YOUR SPECIFICATION

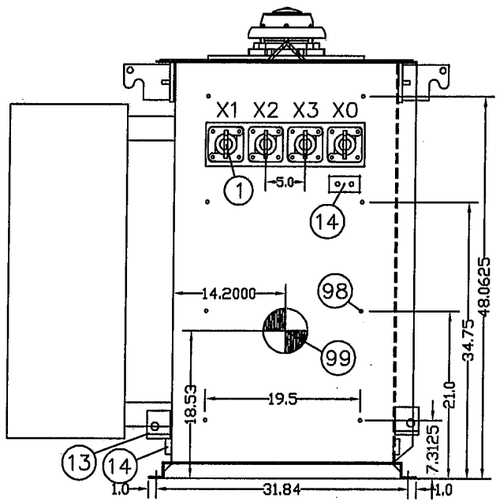
NO._____ DATED_____

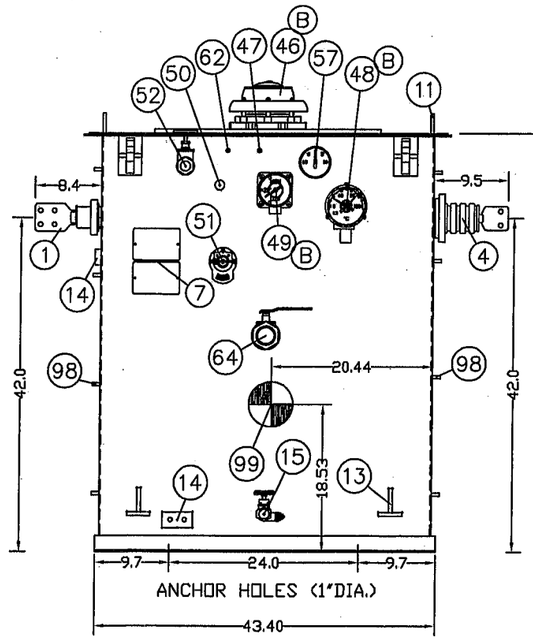
PLEASE RETURN TO HOWARD INDUSTRIES.

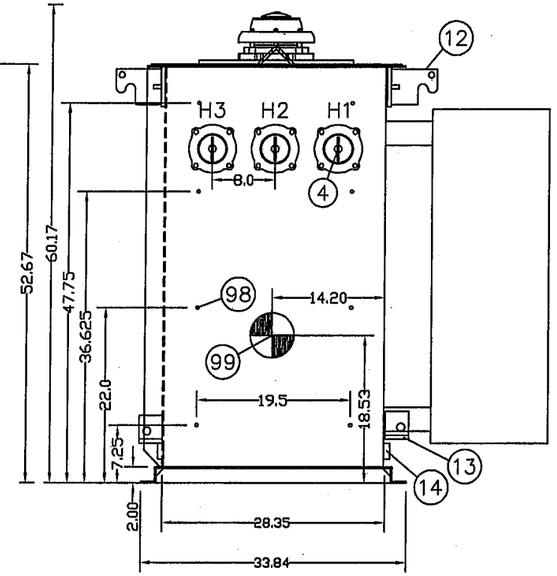
NOTE: IF DISCREPANCIES APPEAR PLEASE NOTE ON UNSIGNED DRAWING AND RETURN



CUSTOMER :	DUTTON
SPEC.	DATED
KVA 500.0 BIL 60	TAPS TS-2 ABOVE 2 BELOW
HIGH VOLTAGE 2400	
LOW VOLTAGE 480Y/277	
APPROX. CORE AND COIL WEIGHT	2673
APPROX. TANK AND ACCESS. WEIGHT	940
GAL. OF OIL 202 , APPROX. WEIGHT	1516
APPROX. TOTAL WEIGHT	5129







	SPECIAL NOTES
A	STAINLESS EXTERNAL HARDWARE
B	72" CONTROL CABLES ATTACHED,
	COILED AND TIED FOR USE
C	
D	
E	NO RUNNERS OR PALLET PROVIDED

$7SBC897

HOWARD INDUSTRIES INC.

LAUREL, MISS. USA 39440

MFG. OF DISTRIBUTION TRANSFORMERS

NAME: OUTLINE			CC 745
CAT. NO. 9985490014037			
ID. 3BCB9715		PN.	274042-00
SCALE 0.056	DWG BY BC	CHK BY	DATE 11/04/13

ORIGINAL CONSTRUCTION DRAWING

REV	DESCRIPTION	BY	DATE	REV	DESCRIPTION	BY	DATE	REV	DESCRIPTION	BY	DATE

READ INSTRUCTION MANUAL
HI 105 BEFORE OPERATING
THREE PHASE TRANSFORMER
CLASS KNAN

HOWARD INDUSTRIES ELLISVILLE, MS USA
DOE COMPLIANT

60 HERTZ
65 °C RISE %IMP

KVA 500
HV 2400
LV 480Y/277

LIQUID:ENVIROTEMP (FR3) CONTAINS LESS THAN 1 PPM PCB AT TIME OF MANUFACTURE
LIQUID LEVEL BELOW TOP OF MANHOLE FLANGE AT 25°C IS 7.00 INCHES. LIQUID
LEVEL CHANGES 0.29 INCHES PER 10° C CHANGE IN LIQUID TEMPERATURE.
MAXIMUM OPERATING PRESSURES OF LIQUID PRESERVATION SYSTEM 10 PSI POSITIVE
AND 8 PSI NEGATIVE. TANK SUITABLE FOR 7 PSI VACUUM FILLING

APPROXIMATE WEIGHTS

202	GALS. LIQ.	1516 LBS	TANK AND FITTINGS	940	LBS
CORES & COILS		2673 LBS	TOTAL	5129	LBS

SER. NO. BAR CODE CAT. NO. BAR CODE

9985490014037
P.N. 061200829500
SER. NO.

℄

ACTUAL TESTED IMPEDANCE WILL BE STAMPED AT TIME OF MANUFACTURE

DATE OF MANUFACTURE WILL BE STAMPED AT TIME OF MANUFACTURE

APPROVAL DRAWING
PLEASE INDICATE BY SIGNING
APPROVED_____DATE_____

THIS DRAWING REPRESENTS THE TRANSFORMER COVERED BY YOUR SPECIFICATION

NO._____DATED_____
PLEASE RETURN TO HOWARD INDUSTRIES.

NOTE: IF DISCREPANCIES APPEAR PLEASE NOTE ON UNSIGNED DRAWING AND RETURN

$7SBC897 3BCB9736

HOWARD INDUSTRIES INC.
LAUREL, MISS. USA 39440
MFG. OF DISTRIBUTION TRANSFORMERS

PG 1 OF 2

NAME: LASER NAME PLATE				CC	857
CAT. NO. RF/TP/D-Y					
ID. 3BCB9736			PN. 61200829.500		
SCALE 1.000	DWG BY BC	CHK BY	DATE: 11/05/13		

REV	DESCRIPTION	BY	DATE	REV	DESCRIPTION	BY	DATE	REV	DESCRIPTION	BY	DATE

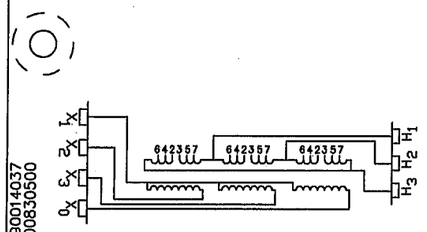
READ INSTRUCTION MANUAL
HI 105 BEFORE OPERATING

HOWARD INDUSTRIES ELLISVILLE, MS USA

H.V. WINDING CONNECTIONS				
VOLTAGE H1–H2–H3	500 KVA AMPS	TAP	CONNECTS	
2520	114.6	1/A	2 TO 3	HV
2460	117.3	2/B	3 TO 4	CU
2400	120.3	3/C	4 TO 5	
2340	123.4	4/D	5 TO 6	LV
2280	126.6	5/E	6 TO 7	CU

L.V. WINDING CONNECTIONS	
VOLTS X1–X2–X3	500 KVA AMPS
480	601

BIL LEVELS	
HV WINDING	60 KV
LV WINDING	30 KV



9985490014037
P.N. 006120083050O

SER. NO. BAR CODE CAT. NO. BAR CODE

SER. NO.

LVBLOC = (S2) LV SEG. BLOCK
CPN11 = (11G) LVB BLOCK
CPHAS1 = (WYE) LV PHASE

HVBLOC = (S4) HV SEG. BLOCK
CNP2 = (2N) HVB BLOCK
CPHAS2 = (DEL) HV PHASE

CODE5 = (S) TAP CODE

APPROVAL DRAWING

PLEASE INDICATE BY SIGNING

APPROVED_____ DATE_____

THIS DRAWING REPRESENTS THE TRANSFORMER COVERED BY YOUR SPECIFICATION

NO._____DATED_____

PLEASE RETURN TO HOWARD INDUSTRIES.

NOTE: IF DISCREPANCIES APPEAR PLEASE NOTE ON UNSIGNED DRAWING AND RETURN

$7SBC897 3BCB9739

HOWARD INDUSTRIES INC.
LAUREL, MISS. USA 39440
MFG. OF DISTRIBUTION TRANSFORMERS

PG 2 OF 2

NAME: LASER NAME PLATE			CC 857
CAT. NO. RF/TP/D–Y			
ID. 3BCB9736		PN. 61200830.500	
SCALE 1.000	DWG BY BC	CHK BY	DATE: 11/05/13

REV	DESCRIPTION	BY	DATE	REV	DESCRIPTION	BY	DATE	REV	DESCRIPTION	BY	DATE

APPROVAL DRAWING

PLEASE INDICATE BY SIGNING

APPROVED_____ DATE_____

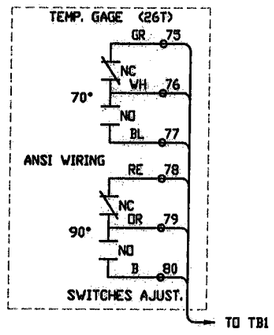
THIS DRAWING REPRESENTS THE TRANSFORMER COVERED BY YOUR SPECIFICATION

NO._____DATED_____

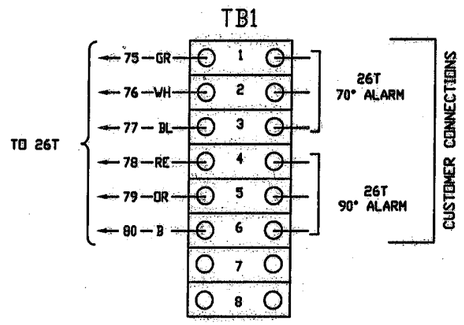
PLEASE RETURN TO HOWARD INDUSTRIES.

NOTE: IF DISCREPANCIES APPEAR PLEASE NOTE ON UNSIGNED DRAWING AND RETURN

FIELD DEVICES



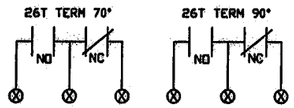
CONTROL BOX



1: 26T, THERMOMETER GAGE

NORMALLY OPEN	WH - WHITE	RE - RED
NORMALLY CLOSED	GR - GREEN	B - BLUE
TERMINAL BLOCK	BL - BLACK	YL - YELLOW
	OR - ORANGE	BN - BROWN
		PU - PURPLE

TERMINAL BLOCK SPECS: 600V, 40A, 8-18AWG, 20 LB-IN TORQUE



GAGE CONTACT SCHEMATIC

HOWARD INDUSTRIES INC.

LAUREL, MISS. USA 39440

MFG. OF DISTRIBUTION TRANSFORMERS

PART NUMBER:	71754032.713
NAME:	WIRING DIAGRAM
CC	719
DESCR:	9985490014037

PG	SCALE	DWG BY	CHK BY	DATE
1 OF 1	NTS	BC	JS	11/05/13