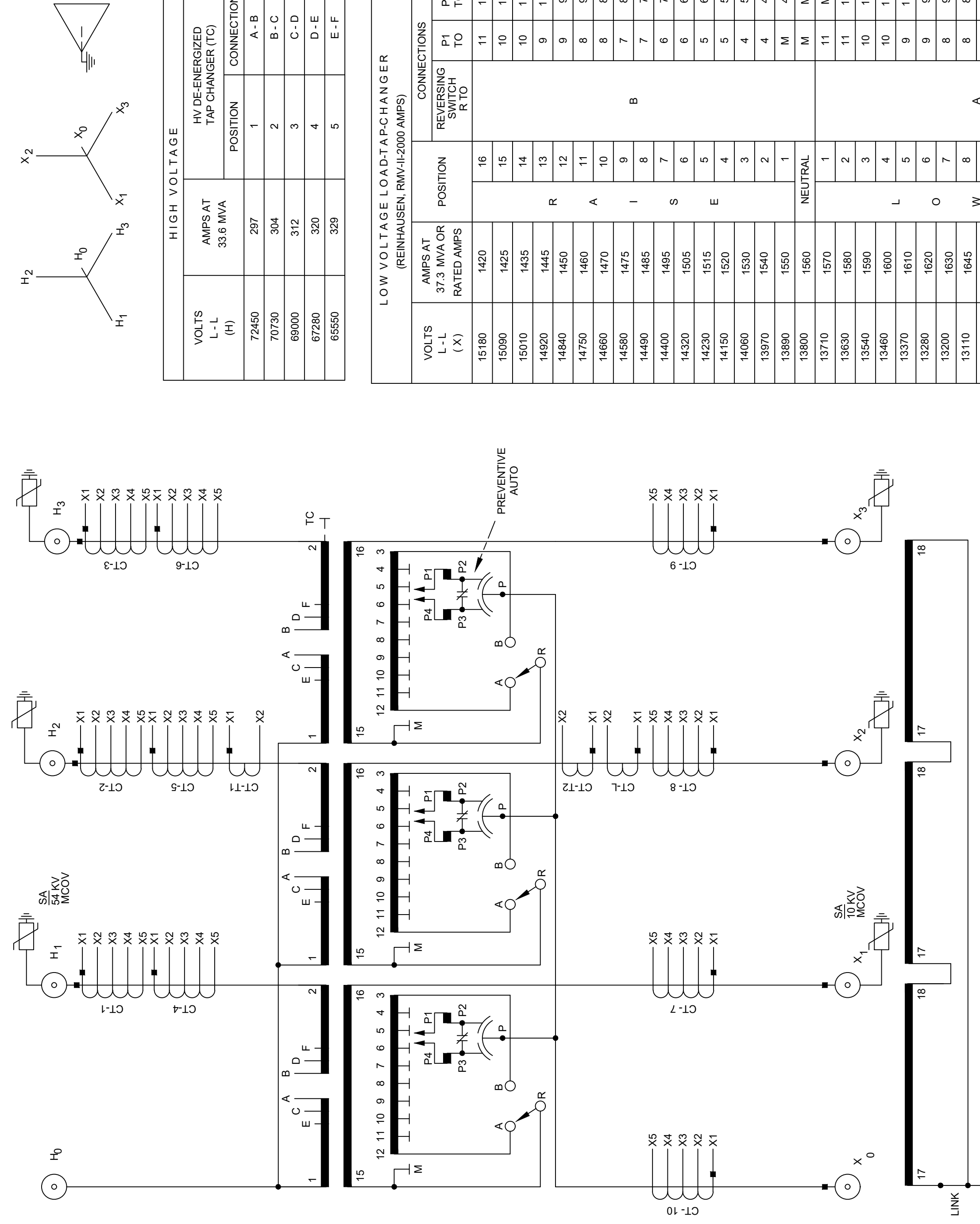


NOTE: PROVIDE 1/8" MOUNTING HOLE.

# LOAD-TAP-CHANGING TRANSFORMER

S/N CLASS ONAN/ONAF/ONAF THREE PHASE 60 HERTZ  
 HV (CU) 350 KV/BIL 69000/39840 VOLTS  
 LV (CU) 110 KV/BIL 13800GRDY/7960 VOLTS  
 HV NEUTRAL 350 KV/BIL  
 LV NEUTRAL 110 KV/BIL  
 TV (CU) 35% BURIED 7960 VOLTS  
 CONT. TEMP. RISE 55° C 20/26.7/33.3 MVA  
 IMPEDANCE 65° C 22.4/29.9/37.3 MVA  
 % AT 69000 - 13800 VOLTS AND 20 MVA



HIGH VOLTAGE		HV DEENERGIZED TAP-CHANGER (TC)	
VOLTS L-L (H)	AMPS AT 33.6 MVA	POSITION	CONNECTIONS
72450	297	1	A-B
70730	304	2	B-C
69000	312	3	C-D
67280	320	4	D-E
65550	329	5	E-F

LOW VOLTAGE LOAD-TAP-CHANGER (REINHOLDEN RMW/H-2000 AMPS)			
VOLTS L-L (X)	AMPS AT 37.3 MVA OR RATED AMPS	POSITION	CONNECTIONS REVERSING SWITCH TO P1 TO P4
15180	1420	16	11 11
15090	1425	15	10 10
15010	1435	14	10 10
14920	1445	13	9 10
14840	1460	12	9 9
14750	1480	11	8 9
14660	1470	A	8 8
14580	1475	I	7 8
14490	1485	7	7 7
14400	1495	S	6 7
14320	1505	6	6 6
14230	1515	E	5 6
14150	1520	4	5 5
14060	1530	3	4 5
13970	1540	2	4 4
13890	1550	1	M 4
13800	1560	NEUTRAL	M M
13710	1570	1	11 M
13630	1580	2	11 11
13540	1590	3	10 11
13460	1600	4	10 10
13370	1610	L	9 10
13280	1620	O	9 9
13200	1630	7	8 9
13110	1645	8	8 8
13020	1655	9	7 8
12940	1665	10	7 7
12850	1675	E	6 7
12770	1685	12	6 6
12680	1700	R	5 6
12590	1710	14	5 5
12510	1720	15	4 5
12420	1735	16	4 4

APPROXIMATE WEIGHTS (LBS)	
UNTANKING (CORE & COIL)	85,000
TANK & FITTINGS	44,475
OIL - MAINTANK ( 5.175 GAL)	38,825
OIL - RADIATORS ( 675 GAL)	5,075
OIL - LTC TANK ( 350 GAL)	2,625
TOTAL ( 6,200 GAL)	166,000

\* INCLUDES 2000 LBS. PREVENTIVE AUTO.  
 BUSHING CURRENT TRANSFORMER FOR WINDING HOT-SPOT TEMPERATURE RATIO: 1600:5  
 CT-L

F885010  
 REVISION 0

BUSHING CURRENT TRANSFORMER FOR WINDING HOT-SPOT TEMPERATURE RATIO: 400:5		
CURRENT RATIO	TAP	TAP
300:5	X3-X4	X1-X3
400:5	X1-X2	X1-X4
500:5	X4-X5	X2-X5
600:5	X2-X3	X1-X5
1100:5	X2-X4	

OIL LEVEL BELOW TOP OF MANHOLE FLANGE AT 25° C 13.0 INCHES  
 OIL LEVEL CHANGES 0.88 INCHES PER 10° C CHANGE IN OIL TEMPERATURE. TRANSFORMER TANK TO WITHSTAND FULL VACUUM AND 15 LBS. POSITIVE PRESSURE.  
 TRANSFORMER FILLED WITH INHIBITED OIL.

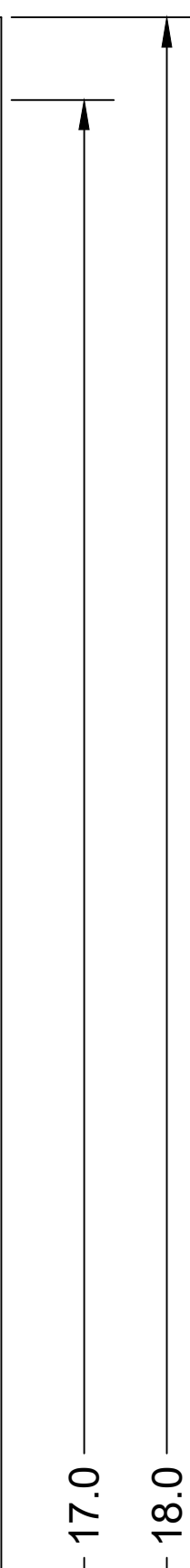
DELTA STAR, INC.  
 LYNCHBURG OPERATION  
 3550 MAYFLOWER DR., LYNCHBURG, VA 24506  
 (804) 845-0007

BEFORE INSTALLING OR OPERATING, READ INSTRUCTIONS.  
 THE UNIT DID NOT CONTAIN PCB AT TIME OF INITIAL FILLING.

NOTE: TRANSFORMER IS DESIGNED FOR A NOMINAL 8.5% IMPEDANCE (HV - LV) ON A 20 MVA BASE, WITH A ± 7.5% STANDARD TOLERANCE. EXACT IMPEDANCE VALUE TO BE ADDED AFTER FACTORY TESTING.

SERIAL NUMBER	MVA	VOLTAGE (KV)	IMPEDANCE (%)
	20	69 - 138	
	20	69 - 138	

TRAVERSE CITY LIGHT & POWER DEPT.  
 S.O. # F-885010/51  
 P.O. # CONTRACT  
 HALL STREET SUBSTATION



FILE  
 M105002

DRAWING  
 861

TRAVERSE CITY LIGHT & POWER  
 HALL STREET SUBSTATION  
 TRANSFORMER NO.2 - NAMEPLATE

URS  
 GRAND RAPIDS, MI.  
 3995 SPARK DR., S.E.  
 616-574-8800  
 architecture,  
 interiors, inc.

DATE	ISSUED FOR
05/26/2004	APPROVED FINAL RECORD DRAWINGS
07/07/03	FINAL RECORD DRAWINGS
02/17/03	RECORD DRAWINGS
05/16/02	BIDS AND CONSTRUCTION
03/27/02	75% ANKER REVIEW
07/2002	PRELIMINARY DESIGN

DA/E PKM  
 DR PKM  
 CK PKM  
 APP PKM  
 MALONEY IN CHARGE