



Field Replacement of L-828/829 Analog Ammeter with Digital Power Meter

Document No. ALN117

Issued: June 10, 2005

Rev. C: April 15, 2009

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Record of Changes

Page	Rev	Description	EC No.	Checked	Approved	Date
All	A	Released new Service Bulletin	N/A	WT	WT	6/7/05
All	B	Revised per J Reichert installation trip	N/A	WT/JR	WT	6/20/05
All	C	Revised for new CCT/CCF and DPM Kits	N/A	RW	GM	4/15/09

Filed Replacement of L828/L829 Analog Ammeter with Digital Power Meter

1. Introduction

This service bulletin provides instructions to replace an existing ammeter with a digital power meter.

2. Special Tools and Equipment Required

Refer to Tables 1 and 2 for the tools and equipment required to install the Digital Meter.

Table 1. Required Equipment Supplied with 94A0535/XX

Description	Part Number	Quantity
Service Bulletin	ALN117	1
Retrofit Kit *	94A0425	
Mounting Kit	Various	1

*NOTE kit includes all necessary components and mounting hardware.

Table 2. Required Equipment Not Supplied

Description	Quantity
Assorted screwdrivers and hex sockets	A/R
Vacuum cleaner w/hose	1
Drill and assorted drill bits	AR
Countersink (for deburring drilled holes)	AR
Wire Strippers/Cutters	AR
Center Punch	
Wire Terminal Crimpers - 18AWG	AR
Instruction Manual supplied with CCR	1

3. General Instructions and Part Identification



WARNING: Danger High Voltage. Disconnect power to CCR before attempting removal and replacement of ammeter. Failure to observe this warning may result in personal injury, death, or equipment damage.



WARNING: Procedure requires that holes must be drilled into the component mounting plate inside of the CCR cabinet to mount

Service Bulletin ALN117

various components supplied in the retrofit kit. Drill chips and burrs from the mounting plate must **be contained and removed to prevent damage to the electronic components.**

SAS recommends that surrounding components near, and particularly underneath, drilling sites be covered to prevent metal chips from contaminating components. After all drilling has been completed, use a vacuum to remove all metal chips.

Kit component identification:

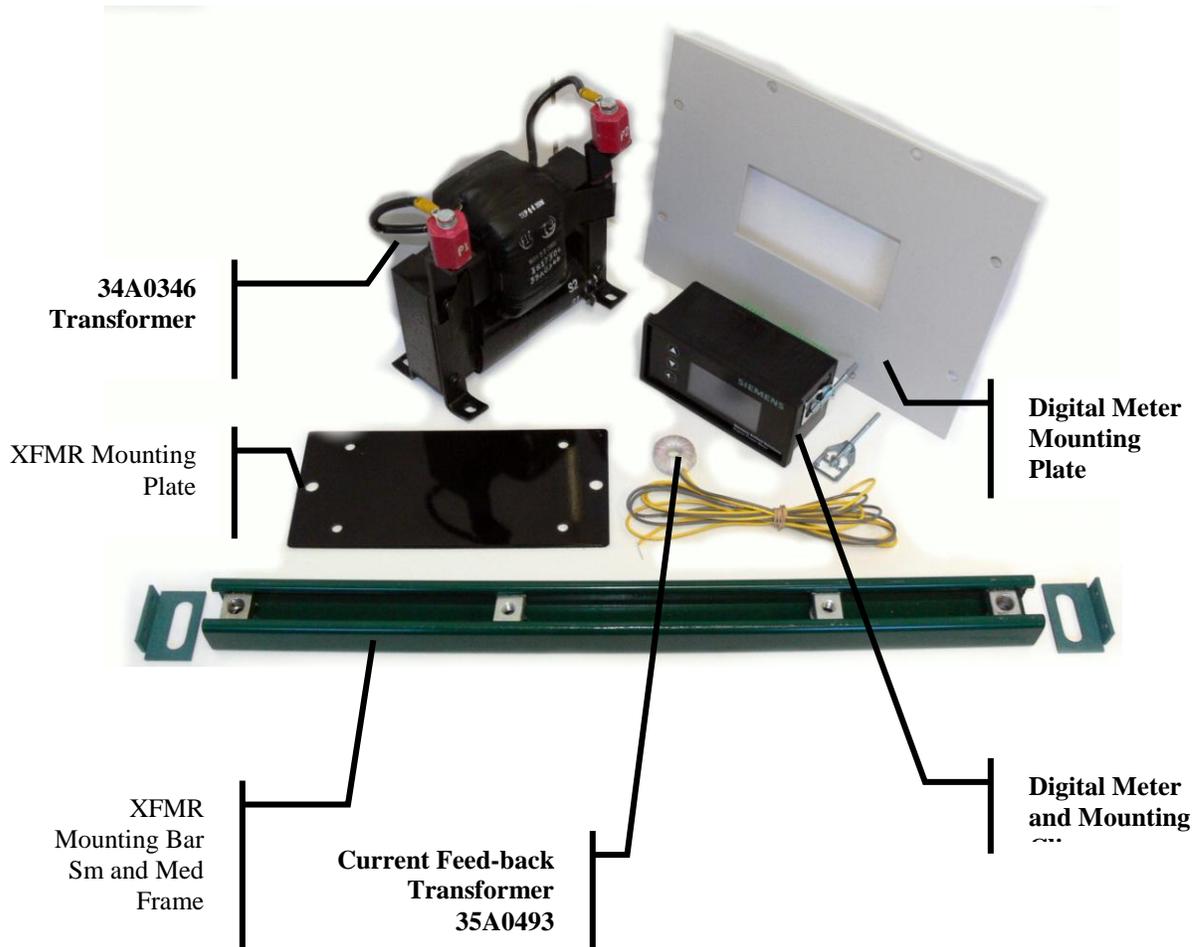


Fig 1 Part Identification

4. Analog Meter Removal Procedure

1. Remove the top and right side CCR skin panels for access to the component mounting plate.
2. Open the front door for access to the ammeter and the component mounting plate. Remove the two wires connected to the ammeter from the CCR. Use a length of this wire to short the secondary of T2 that fed the analog meter.

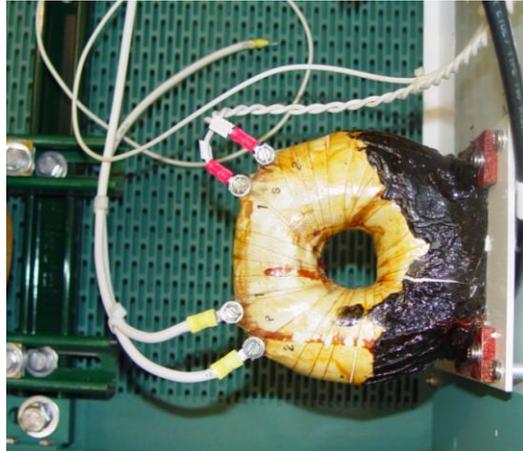
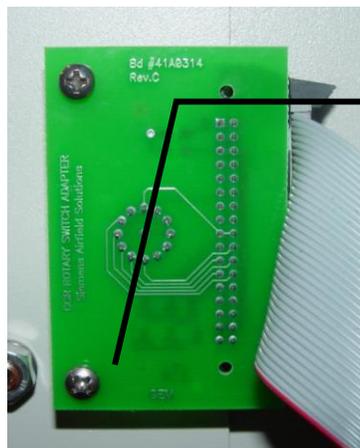


Fig 2 T2 Transformer

3. Remove the Rotary Switch from the door and meter mounting panel by removing the mounting screws shown below and the rotary switch knob from the front side of the door.



Switch PCB Mounting
Screws (2)

Fig 3 Rotary Switch PCB

4. Next, remove the analog meter mounting panel from the door. Disconnect the leads to the meter and then remove all eight (8) of the hex nuts and lockwashers on the backside of the door to remove the meter and mounting panel. Save these (8) hex nuts and lockwashers to re-attach the new DPM mounting plate.

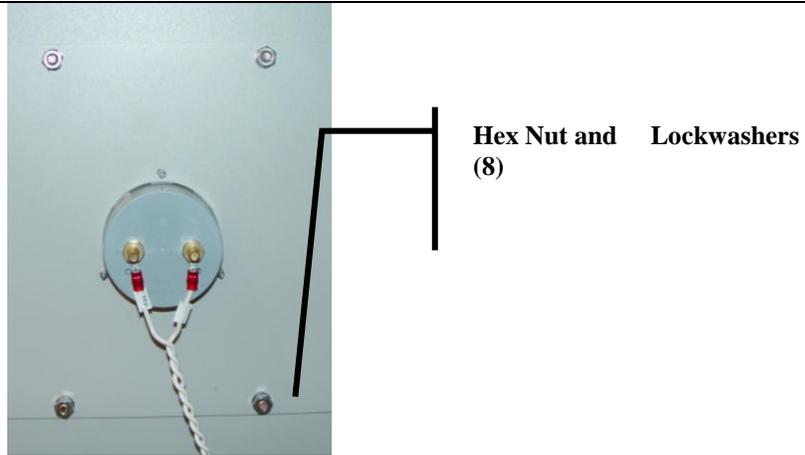


Fig 4 Rear View Ammeter

5. Digital Power Meter Installation Procedure

NOTE: See Section 3 for warning on metal chip contamination.

NOTE: See Wiring Diagram 43A2522, and 43A2845 in Section 6.

Sm. Frame CCR	H33 x W24 x D25	4-10kw CCT	94A0535/10
		4-7.5kw CCF	
Med Frame CCR	H36 x W29 x D30	10kw CCF ¹	94A0535/20
		15kw CCF	
		15-30kw CCT	
Lg. Frame	H40 x W33 x D34	20-30kw CCF	94A0535/30

- Assemble the transformer and bar assembly if you are installing into a small or medium frame CCR. See the schematic section.
To install the transformer into a large frame CCR: Connect the transformer to the top of the regulator main transformer core as shown in the following diagram (46, 47, 36, and 34).

¹ As of 3/13/09 10kw CCF was moved to medium frame from the small frame. 240-480 V, 10kw regulators were built in small frames from 6/28/05 until 3/13/09. See 94A0535 for alternative T7 mounting location if 10kw (240-480 V) built between these dates.

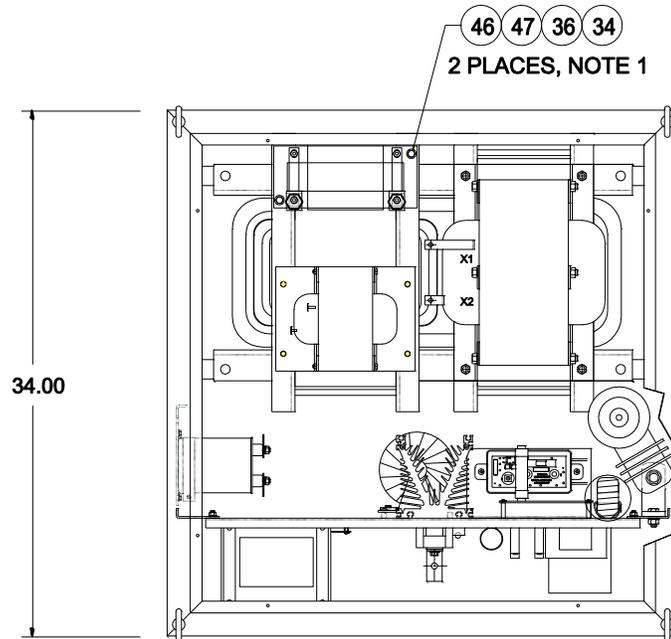


Fig 5 T7 Mounting, Large Frame

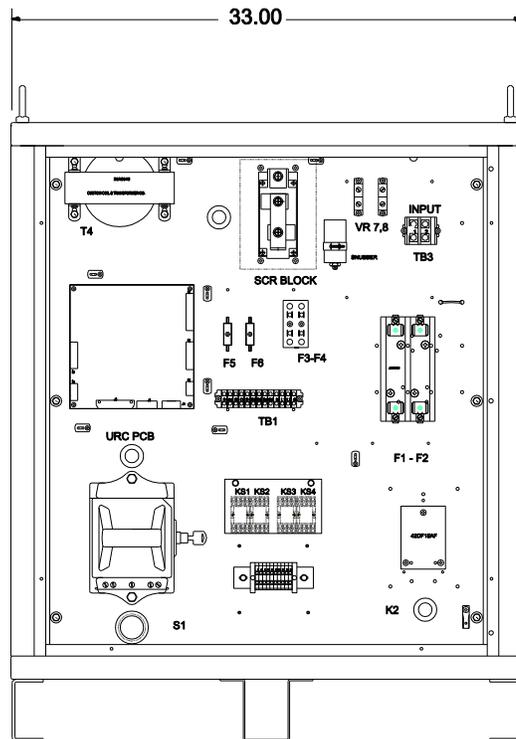


Fig 6 T7 Mounting, Large Frame (view 2)

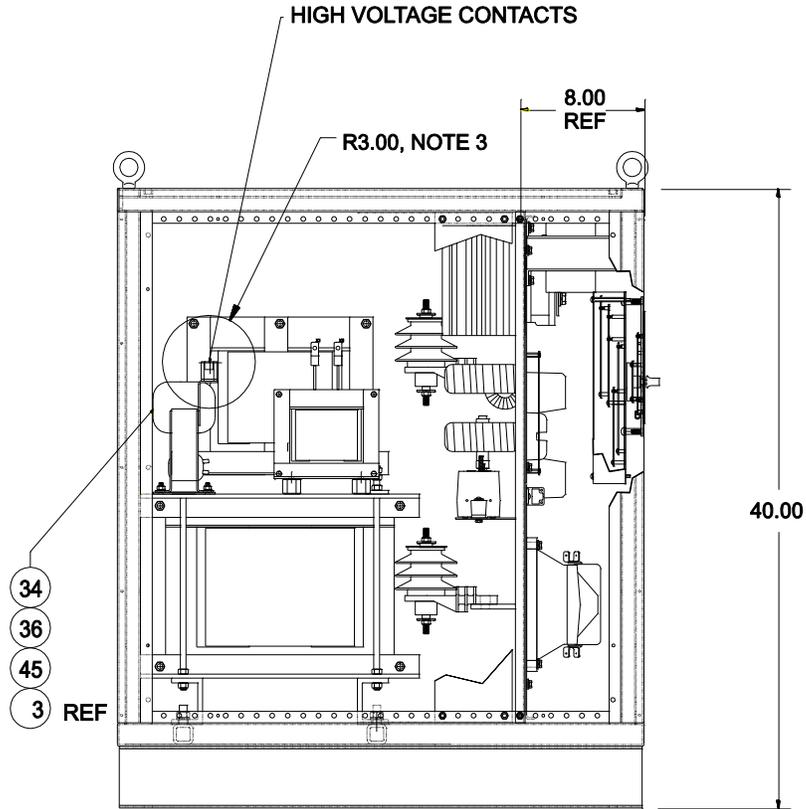


Fig 7 T7 Mounting, Large Frame (view 3)

44A6917 BOM				
3	35A0346	VOLTAGE TX, 5000 / 50V, 50-60HZ.	EA	REF
34	65A0015/24	1/4-20 HEX NUT	EA	6
36	66A0026/24	1/4 SPLIT LOCKWASHER	EA	6
45	60A2666	PLATE, TX MOUNTING, 20KW FERRO URC	EA	1
46	64A0173/14	1/4-20 X 7/8 HEX HEAD BOLT	EA	2
47	66A0015/24	1/4 FLATWASHER	EA	2

NOTES:

1. SOME MAIN CORES ARE NOT MACHINED FOR T7 PLACEMENT. MACHINING MAY BE REQUIRED AT THESE MOUNTING LOCATIONS.

2. TRANSFORMER MOUNTING PANEL 60A2666 MAY BE OMITTED ON 30KW FERRO REGULATORS.

3. IT IS IMPERATIVE THAT A WINDOW OF OPEN AIR AROUND THE HIGH VOLTAGE CONTACTS OF T7 REMAINS A MINIMUM OF 3 INCHES RADIUS AWAY FROM SURROUNDING OBJECTS.

T7 Mounting	35A0346	
Mounting Kit	44A6478/M	CCF6610
		CCF6615
		CCT6615
		CCT6620
		CCT6630
	44A6478/S	CCF6604
		CCF6607
		CCT6604
		CCT6607
		CCT6610
	44A6917	CCF20-30

2. Install current feed-back transformer around one of the output leads (e.g. at the Series Cut Out) as shown or any other available location.

NOTE: This transformer can also be installed on the secondary of T2 that previously fed the analog meter. Install the wire added earlier to short T2 through this transformer.



Fig 8 Installation of Current Feed Back Transformer

3. Take the supplied DPM mounting panel and insert the digital meter from the front side of the panel. Then attach the two meter mounting clips to the side of the meter on the backside of the panel and secure the meter to the panel. Tighten the screw in the mounting clip until the meter is firmly secured to the panel. **CAUTION: DO NOT OVERTIGHTEN. See Figs 9 through 11.**

Next mount the panel assembly to the CCR door by using the eight (8) studs and hex nuts that were used to mount the analog after mounting plate that was removed at the beginning.

6. DPM Kit Diagrams

SIEMENS

SIEMENS AIRFIELD SOLUTIONS, INC.
877 GAHANNA PARKWAY
COLUMBUS, OHIO 43230
TEL: 614-861-1304
FAX: 614-864-2069

PART SPECIFICATION

PART NUMBER:

44A6917

REV:

A

SHEET:

1 OF 1

SCALE:

NTS

PART DESCRIPTION:

DESCRIPTION: MTG KIT, T7 POTENTIAL TX, 20-30KW FERRO

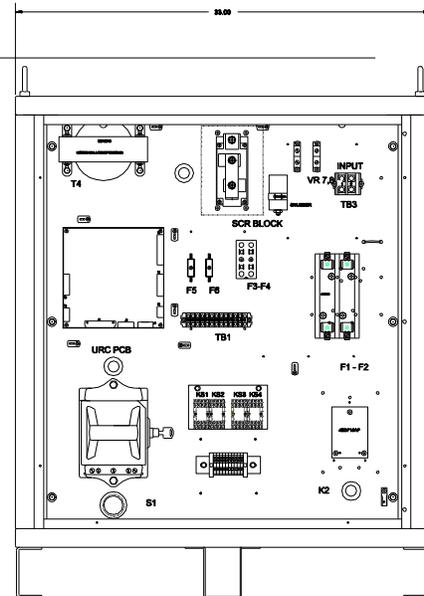
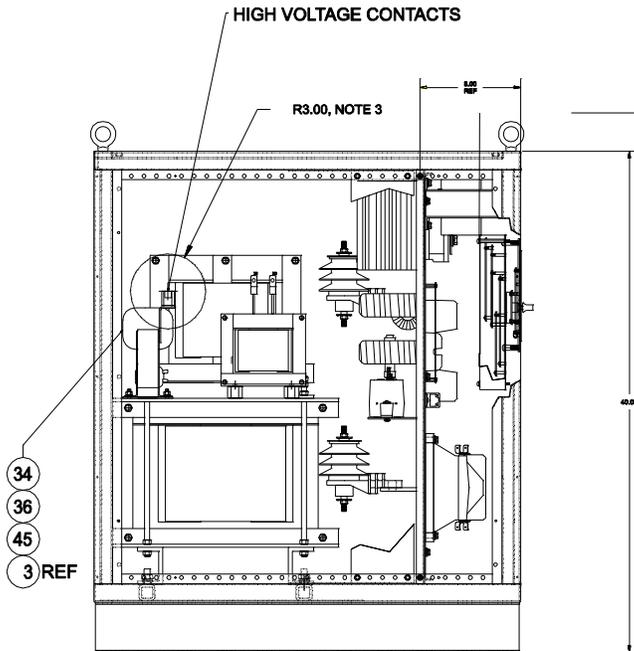
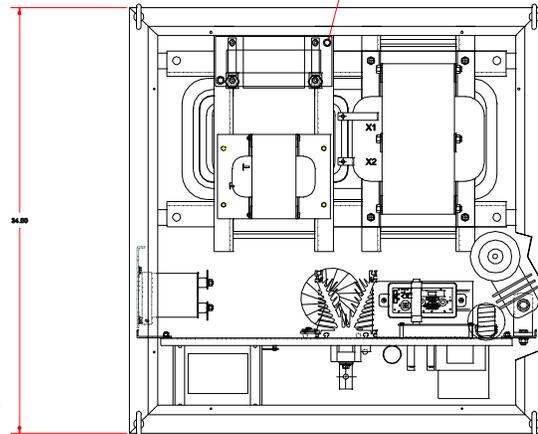
44A6917 BOM				
3	35A0346	VOLTAGE TX, 5000 / 50V, 50-60HZ.	EA	REF
34	85A0015/24	1/4-20 HEX NUT	EA	6
36	86A0026/24	1/4 SPLIT LOCKWASHER	EA	6
45	60A2666	PLATE, TX MOUNTING, 20KW FERRO URC	EA	1
46	64A0173/14	1/4-20 X 7/8 HEX HEAD BOLT	EA	2
47	86A0015/24	1/4 FLATWASHER	EA	2

NOTES:

- SOME MAIN CORES ARE NOT MACHINED FOR T7 PLACEMENT. MACHINING MAY BE REQUIRED AT THESE MOUNTING LOCATIONS.
- TRANSFORMER MOUNTING PANEL 60A2666 MAY BE OMITTED ON 30KW FERRO REGULATORS.
- IT IS IMPERATIVE THAT A WINDOW OF OPEN AIR AROUND THE HIGH VOLTAGE CONTACTS OF T7 REMAINS A MINIMUM OF 3 INCHES RADIUS AWAY FROM SURROUNDING OBJECTS.

APPLICATION VIEW:

46 47 36 34
2 PLACES, NOTE 1



T7 MOUNTING (35A0346) 20KW FERRO REGULATOR SHOWN

REV LEVEL	ECO NUMBER	DESCRIPTION	DRAWN BY	REV DATE
A		CREATION	JEG	08APR09

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RELATED PARTS:

A

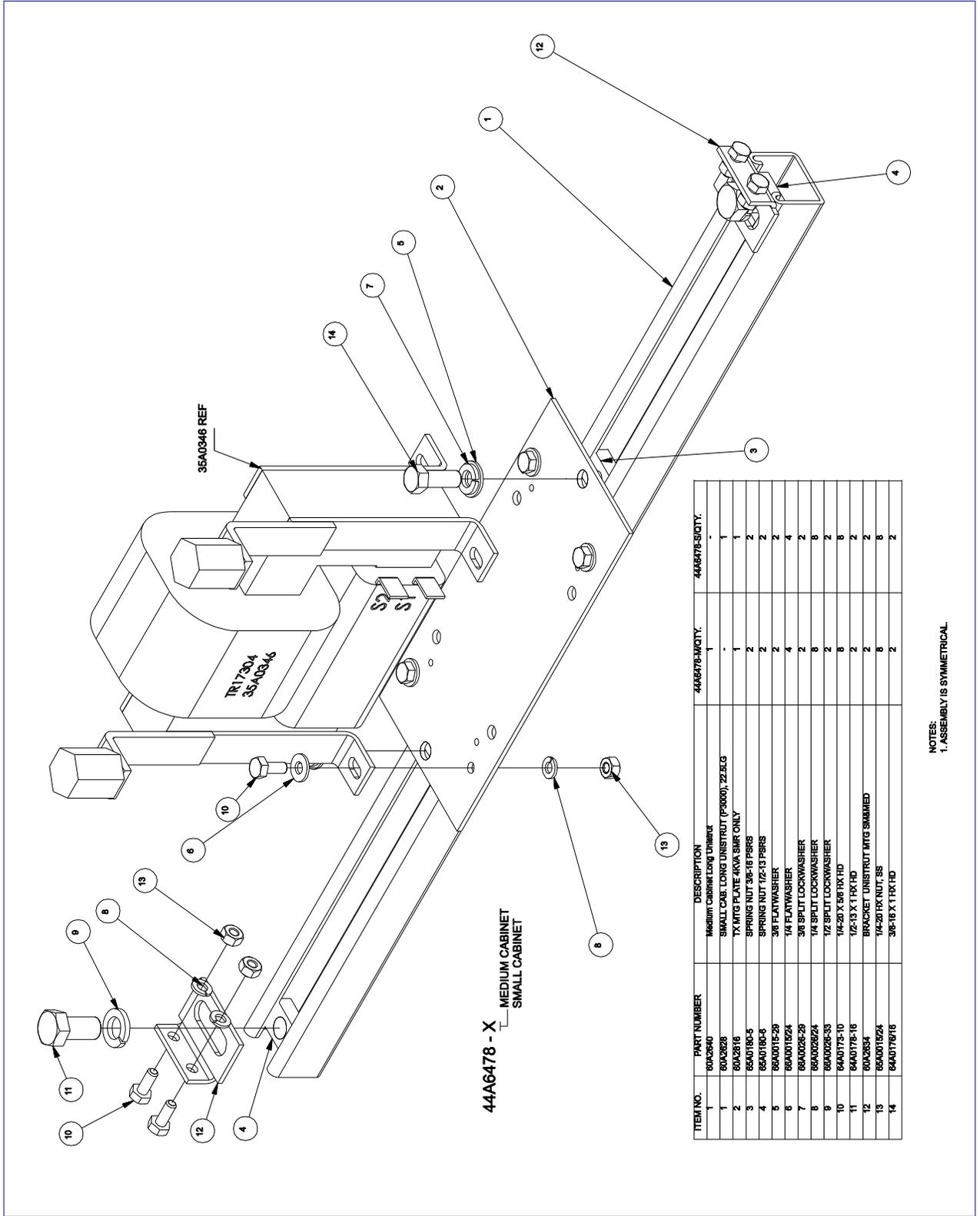
1st USED ON:

A

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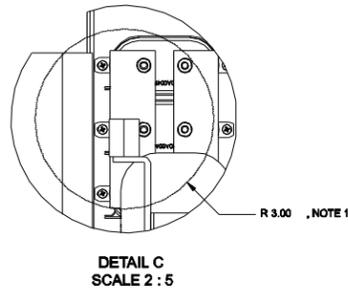
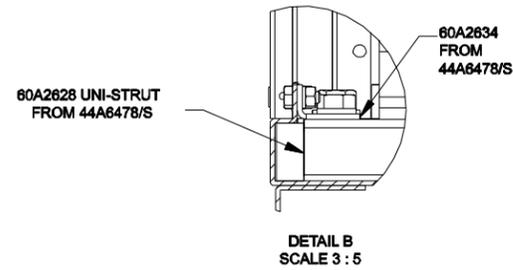
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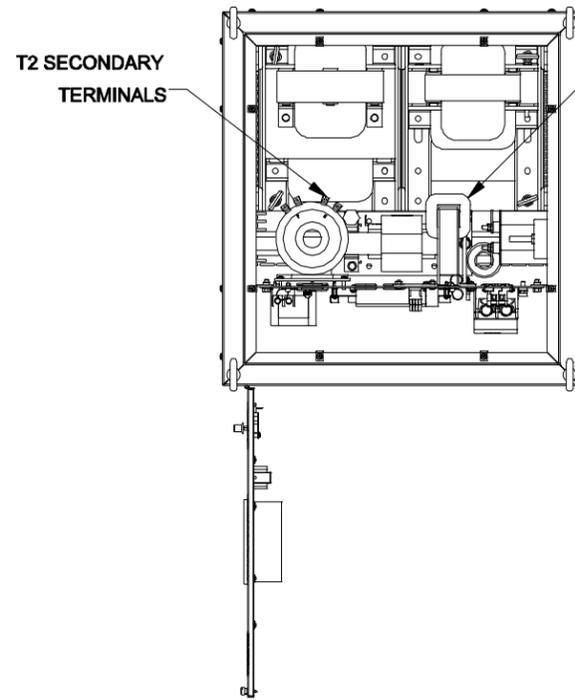
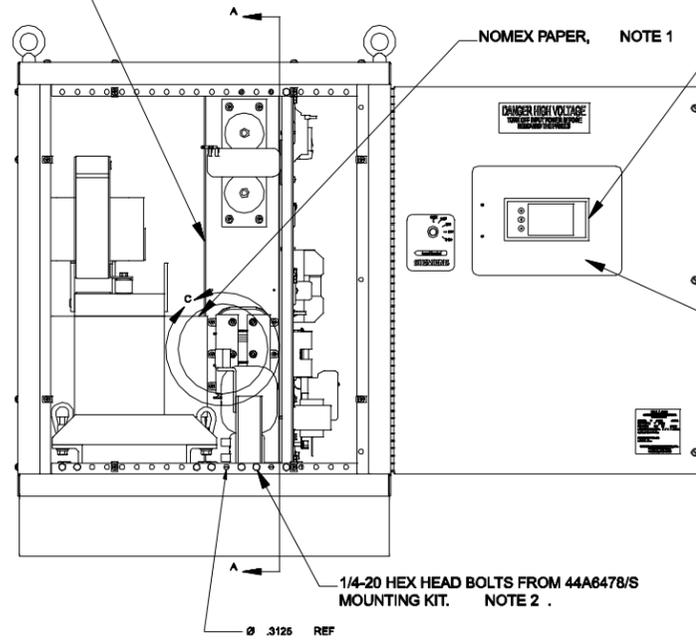


ITEM NO.	PART NUMBER	DESCRIPTION	44A6478-1 QTY.	44A6478-2 QTY.
1	60A2840	Medium Cabinet Long Unit Nut	1	-
2	60A2828	SMALL CAB LONG UNISTRUT (P3000), 2X.5X.5	-	1
3	60A2816	TX MTS PLATE 2X0.5X.5 ONLY	1	1
4	65A0180-5	SPRING NUT 3/8-16 PERS	2	2
5	65A0180-5	SPRING NUT 1/2-13 PERS	2	2
6	65A0175-29	3/8 FLATWASHER	2	2
7	65A0175-24	1/4 FLATWASHER	4	4
8	65A0095-29	3/8 SPLIT LOCKWASHER	2	2
9	65A0095-33	1/2 SPLIT LOCKWASHER	2	2
10	65A0175-10	1/4-20 X.5/8 FX HD	8	8
11	65A0175-16	1/2-13 X 1 FX HD	2	2
12	60A2834	BRACKET UNISTRUT MTS SUMMER	2	2
13	65A0175-24	1/4-20 FX NUT, SS	8	8
14	65A0176-16	3/8-16 X 1 FX HD	2	2

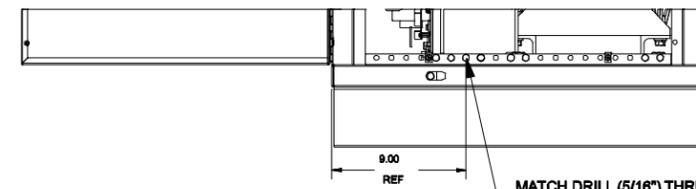
NOTES:
1. ASSEMBLY IS SYMMETRICAL.



CAPACITOR PLATE ASSEMBLY, NOTE 2

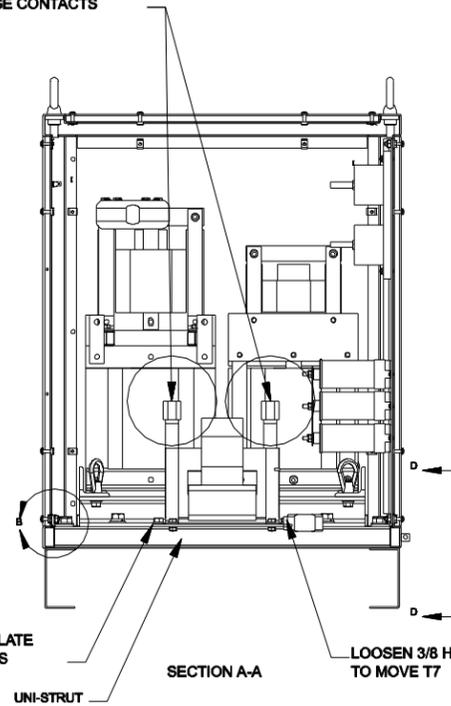


AN ALTERNATE MOUNTING LOCATION EXISTS IN THE SMALL FRAME REGULATORS (CCT 4-10 AND CCF4-7). IF THIS LOCATION IS USED, MOUNT T7 TRANSFORMER WITH #10 HARDWARE.



SECTION D-D

HIGH VOLTAGE CONTACTS

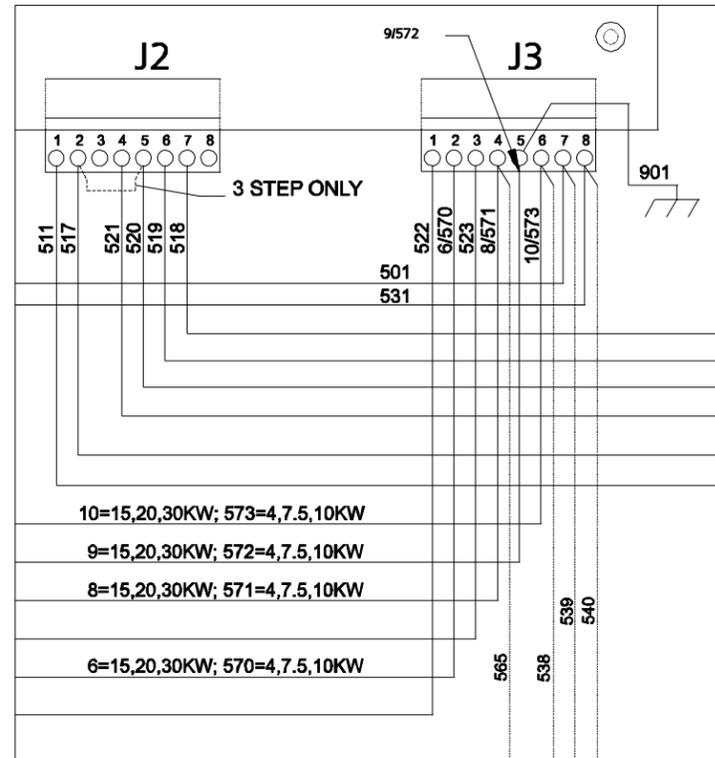


NOTES:

- IT IS IMPERATIVE THAT A WINDOW OF OPEN AIR AROUND THE HIGH VOLTAGE CONTACTS OF T7 REMAINS A MIN. OF 3 INCHES AWAY FROM SURROUNDING OBJECTS. A LESSER PROXIMITY TO NOMEX PAPER USED IN THE MAIN CORE IS ACCEPTABLE.
- MACHINING MAY BE REQUIRED THROUGH THE CAPACITOR MOUNTING PLATE TO INSTALL 60A2634 FROM 44A6478/S.

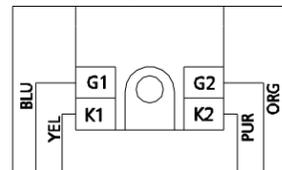
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INITIAL & DATE:					
SIEMENS					
SIEMENS AIRFIELD SOLUTIONS, INC. 977 Goshanna Parkway, Columbus, Ohio 43220 Telephone: 614-861-1304, Fax: 614-864-2089					
DRAWING TITLE DIGITAL POWER METER SIGNATURE SERIES 4-30KW RETRO-FIT KIT					
A	---	CREATION	JEG	08APR08	
REV LEVEL	ECO NUMBER	REVISION DESCRIPTION	DRAWN BY	REV DATE	
94A0535		J. GAFFNEY	DSAPROD		
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94A0535-XX				1 OF 2	
				A	

J2/J3 WIRING DETAIL ENLARGED

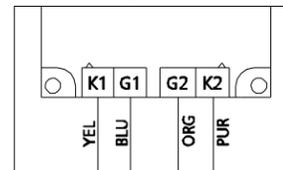


10=15,20,30KW; 573=4,7.5,10KW
 9=15,20,30KW; 572=4,7.5,10KW
 8=15,20,30KW; 571=4,7.5,10KW
 6=15,20,30KW; 570=4,7.5,10KW

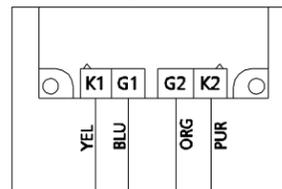
7.5KW, SCR 28A0039, 208-480V (NO GND WIRE)



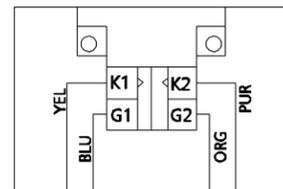
10KW, SCR 28A0038, 208-480V (NO GND WIRE)



15KW, SCR 28A0034, 208-480V (NO GND WIRE)

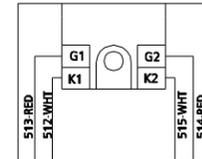


20 & 30KW, SCR 28A0041, (ALSO 28A0028), 208-480V (NO GND WIRE)

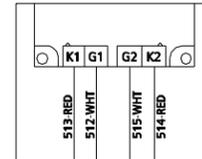


PREVIOUS SCR WIRING

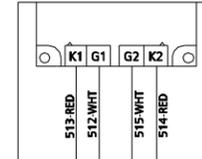
7.5KW, SCR 28A0039, 208-480V (NO GND WIRE)



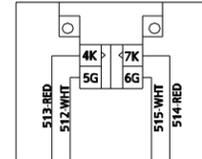
10KW, SCR 28A0038, 208-480V (NO GND WIRE)



15KW, SCR 28A0034, 208-480V (NO GND WIRE)



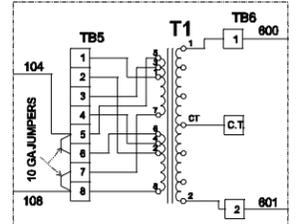
20 & 30KW, SCR 28A0041, (ALSO 28A0028), 208-480V (NO GND WIRE)



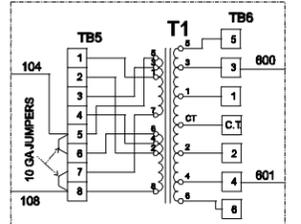
100 SERIES WIRES - PRIMARY POWER - 600V - 105°C

POWER	208 V	220 V	240 V	347V	480 V	2400 V
4 kW	14AWG 89AD184/9	14AWG 89AD184/9	14AWG 89AD184/9	14AWG 89AD184/9	14AWG 89AD184/9	
7.5 kW	8AWG 89AD196/9	8AWG 89AD196/9	8AWG 89AD196/9	8AWG 89AD196/9	14AWG 89AD184/9	
10 kW	8AWG 89AD196/9	8AWG 89AD196/9	8AWG 89AD196/9	8AWG 89AD196/9	14AWG 89AD184/9	
15 kW	4AWG 89AD198/9	4AWG 89AD198/9	6AWG 89AD197/9	6AWG 89AD197/9	10AWG 89AD195/9	
20 kW	1/0AWG 89AD201/9	1/0AWG 89AD201/9	2AWG 89AD199/9	2AWG 89AD199/9	6AWG 89AD197/9	
30 kW	1/0AWG 89AD201/9	1/0AWG 89AD201/9	2AWG 89AD199/9	2AWG 89AD199/9	6AWG 89AD197/9	

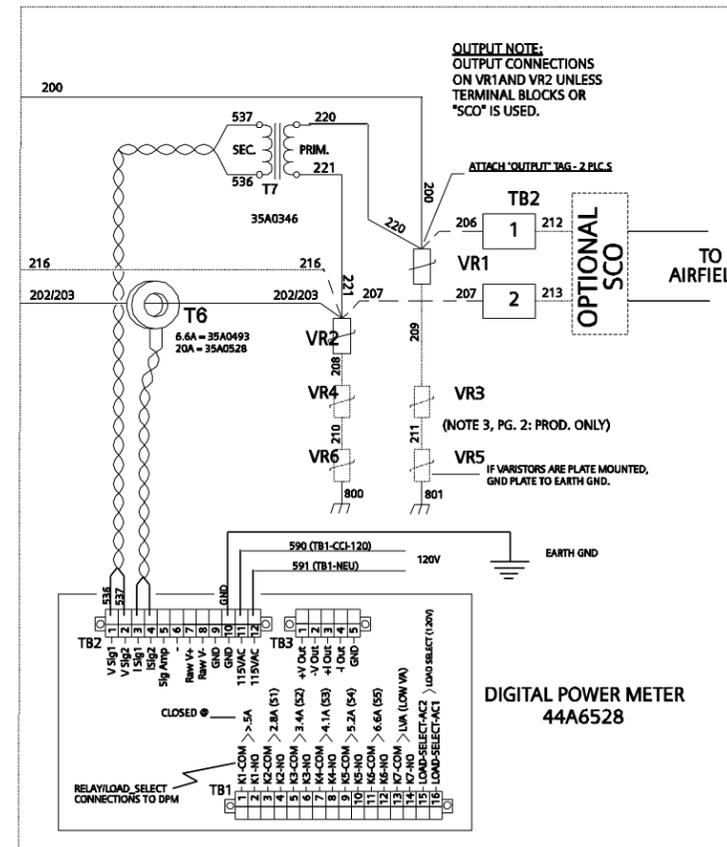
ALT., 7.5KW, 240V, 35C0197 CORE



ALT., 15KW, 240V, 35A0291 CORE



DIGITAL POWER METER OPTION



DIGITAL POWER METER 44A6528

NOTES:

- WIRE SIZES:
 100-113: PRIMARY POWER, SEE TABLE.
 200-217: HIGH VOLT., 12AWG, 25KV, SIL, 89A0086/1.
 400-403: MEDIUM CURRENT, 12AWG, 600V, 89A0185/9.
 500-560: STD CONTROL, 18AWG, 600V, 89A0182/9.
 600-: HI-VOLTAGE, 8AWG, 7.5KV, 89A0202:
 OBSOLETE - USE "200" SERIES WIRE.
 751-759: SMR, 22AWG, 2 COND. W/SHLD, 89A0126.
 800-804: GROUND, 12AWG, 600V, GN/YL, 89A163/5.
 900-905: GROUND, 18AWG, 600V, GN/YL, 89A0163/7.
- SEE BILL OF MATERIALS FOR NUMBER OF MOV'S OR SURGE SUPPRESSORS IN EACH LEG.
- IF 6.6A REGULATOR IS WIRED W/O METER, LAND 507 ON J5-1 IN PLACE OF 505.
- IF 20A REGULATOR IS WIRED W/O METER, LAND 205 ON T3-S2 IN PLACE OF 203.
- IF A JUMPER IS NEEDED FOR ANY CORE LEAD, USE HIGH VOLTAGE 89A0086/1 WIRE.

L	1767	VAR & DPM UPDATES	BE	15MAR07
K	.....	EXTEND T4 LEADS 11 & 12	BE	05SEP06
J	1463	REF. ALSO ECO-1571.	BE	10JUL06
I	1372	SEE ECO (REMOVED 89A0202)	BE	26JAN05
H	1325	SEE ECO (CVM WIRE LABELING)	BE	28SEP04
G	.....	ADDED PPC SENSOR OPT.	BE	29MAR04
F	1224	SEE ECO	BE	08MAR04
E	1158	SEE ECO	BE	14NOV03
D	1141	SEE ECO	BE	19SEP03
C	1133	SEE ECO	BE	25AUG03
B	.....	CORRECTED CVM/T2/M1 NOTE,	BE	16JUL03
A	1070	ADDED 2ND T4 PT. NO. & CORRECTED CHOKE L1 T84 NO.5 TO 1-3-2-4 (WAS 1-2-3-4).	BE	18APR03
M	1829	NEW CONTROL BD, NO T5, RES	JLR	14SEP07

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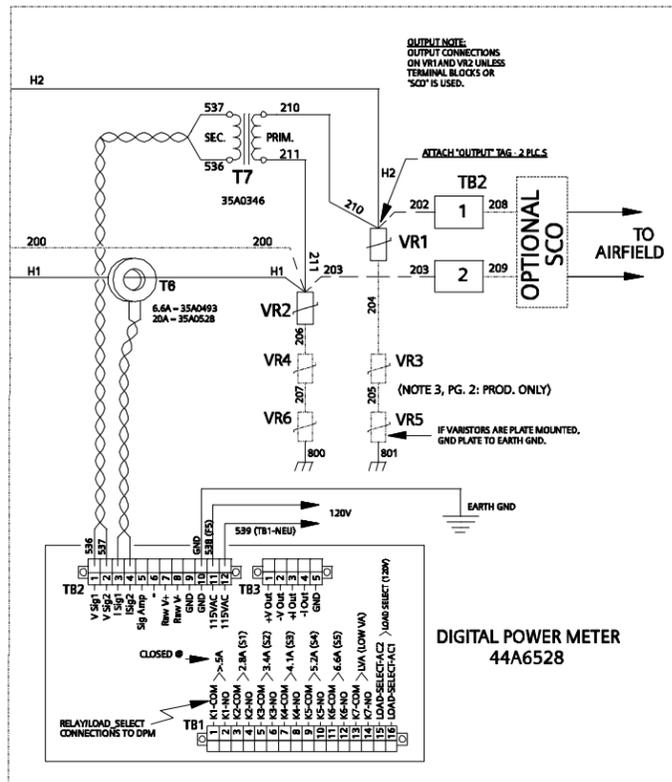
SIEMENS AIRFIELD SOLUTIONS
 977 Gahanna Parkway, Columbus, Ohio 43230
 Telephone: 614-861-1304, Fax: 614-864-2069

DRAWING TITLE:
**WIRING DIAGRAM, L-828 WJURC,
 4 TO 30KW CCT REG., 6.6 & 20AMP,
 SIGNATURE SERIES**

SCALE: N/A SHEET NUMBER: 2 OF 2

DRAWING NUMBER: **43A2845**

DIGITAL POWER METER OPTION



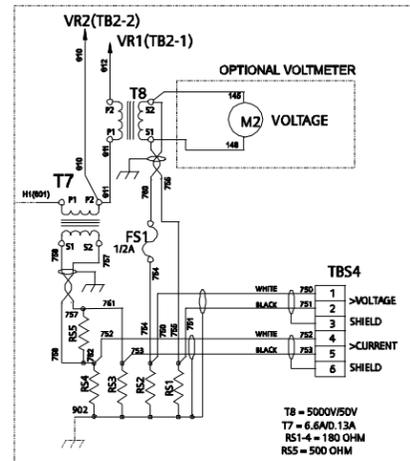
300 SERIES WIRES
TANK LOOP
600V - 105°C

POWER	ALL
4 kW	10 AWG 89A0195/9
7.5 kW	8 AWG 89A0196/9
10 kW	8 AWG 89A0196/9
15 kW	2 AWG 89A0199/9
20 kW	2 AWG 89A0199/9
30 kW	2 AWG 89A0199/9

100 SERIES WIRES - PRIMARY POWER - 600V - 105°C

POWER	208 V	220 V	240 V	347V	480 V
4 kW	14 AWG 89A0184/9		14 AWG 89A0184/9	14 AWG 89A0184/9	14 AWG 89A0184/9
7.5 kW	8 AWG 89A0196/9		8 AWG 89A0196/9	8 AWG 89A0196/9	14 AWG 89A0184/9
10 kW	8 AWG 89A0196/9		8 AWG 89A0196/9	8 AWG 89A0196/9	14 AWG 89A0184/9
15 kW	4 AWG 89A0198/9		6 AWG 89A0197/9	6 AWG 89A0197/9	10 AWG 89A0195/9
20 kW	2 AWG 89A0201/9		2 AWG 89A0199/9	2 AWG 89A0199/9	6 AWG 89A0197/9
30 kW	2 AWG 89A0201/9		2 AWG 89A0199/9	2 AWG 89A0199/9	6 AWG 89A0197/9

SMR OPTION



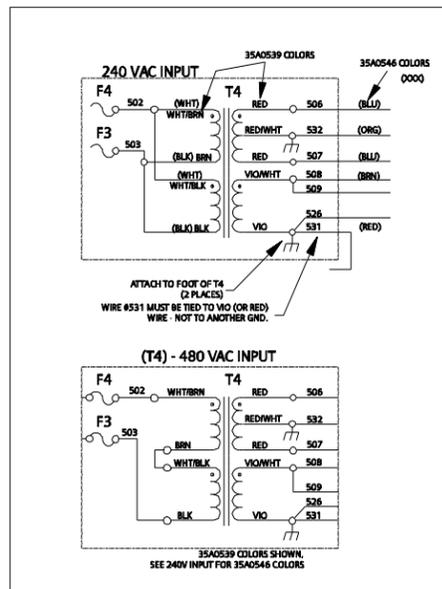
NOTES:

- WIRE NUMBERS REASSIGNED AT THE CREATION OF THIS DOCUMENT.
- WIRE SIZES:
100-105: PRIMARY POWER, SEE TABLE.
200-213: HIGH VOLTAGE, 12AWG, 25KV, 150C, 89A0086/1.
300-305: TANK LOOP, SEE TABLE.
400-409: MEDIUM CURRENT, 12AWG, 600V, 105C, 89A0185/9
500-535: STD CONTROL, 18AWG, 600V, 105C, 89A0182/9.
600-: HI-VOLTAGE, 8AWG, 7.5KV, 89A0202:
OBSOLETE - USE "200" SERIES WIRE.
707-728: SCANNING MONITOR INTERFACE, 18AWG, 600V, 89A0182/9
750-758: SCANNING MONITOR READY, 22AWG 2 COND SHLD, 89A0126
760-762: SCANNING MONITOR READY, 18AWG, 600V, 89A0182/9
800-804: GROUND, 12AWG, 600V, GN/YL, 89A163/5.
900-905: GROUND, 18AWG, 600V, GN/YL, 89A0163/7.
- SEE BILL OF MATERIALS FOR NUMBER OF MOV'S OR SURGE SUPPRESSORS IN EACH LEG.
- USE INDIVIDUAL WIRES TO EACH CAPACITOR BANK.
- DELETED.
- IF A JUMPER IS REQUIRED FOR ANY CORE LEAD, USE HIGH VOLTAGE 89A0086/1 WIRE.

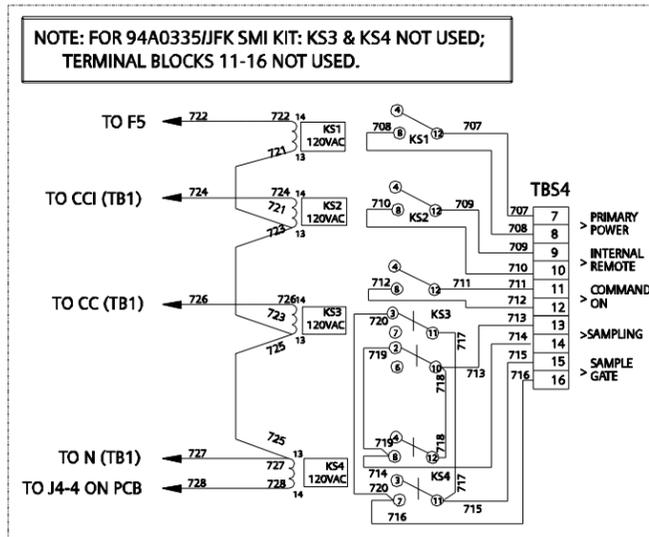
ASSEMBLY NOTES:

- ADD APPROPRIATE JUMPER WHERE REQUIRED (ONLY 1 JUMPER REQ'D FOR A 6.6A, 5-STEP). TIE ALL JUMPERS INTO CABLE HARNESS SO CONNECTOR HAS TO BE PULLED FROM PCB WHEN REPLACING PCB.
- GROUNDING NOTES:
- GND EACH PANEL TO THE FRAME
- JUMPER INTERNAL GND LUG TO EXTERNAL GND LUG

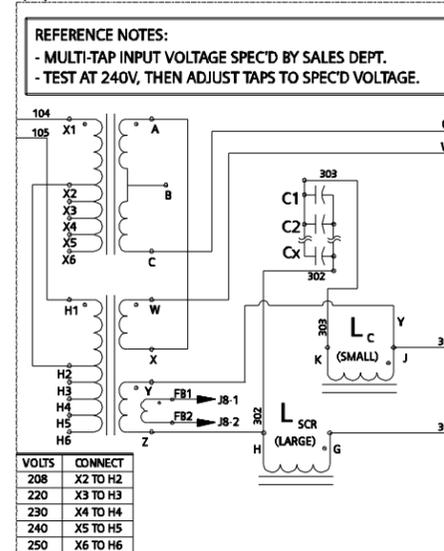
REVS A - H SUPPLY TX LEAD COLORS



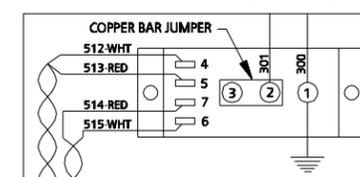
SMI & SMR OPTIONS



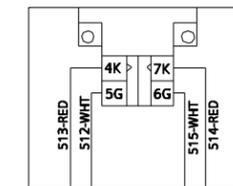
(T1): 7.5KW MULTITAP 35A0636



PREVIOUS 4KW SCR WIRING (28A0011)



PREVIOUS SCR WIRING:
SCR 28A0028, 7.5 - 30KW,
208-480V



REV	DATE	DESCRIPTION	BY	LEVEL
Z	18JUN08			
Y	17DEC07	SEE ECO-1947 (SCR COLOR CODE CHG)	BE	
X	12MAR07	SEE ECO-1860 (DPM & SNUBBER CHG'S)	BE	
W	29NOV06	TITLEBLOCK UPDATE	CMS	
V	05SEP06		BE	
U	ECO-011463		BE	
Z				

DRAWING TITLE:
AIRFIELD LIGHTING COMPUTER SYSTEM
L-828 WURC, 4-30KW, 6.6 & 20AMP,
SIGNATURE SERIES FERRO CCF
WIRING DIAGRAM
2 OF 2

DRAWING NUMBER:
43A2522

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REVISIONS:
10 MAY 01
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