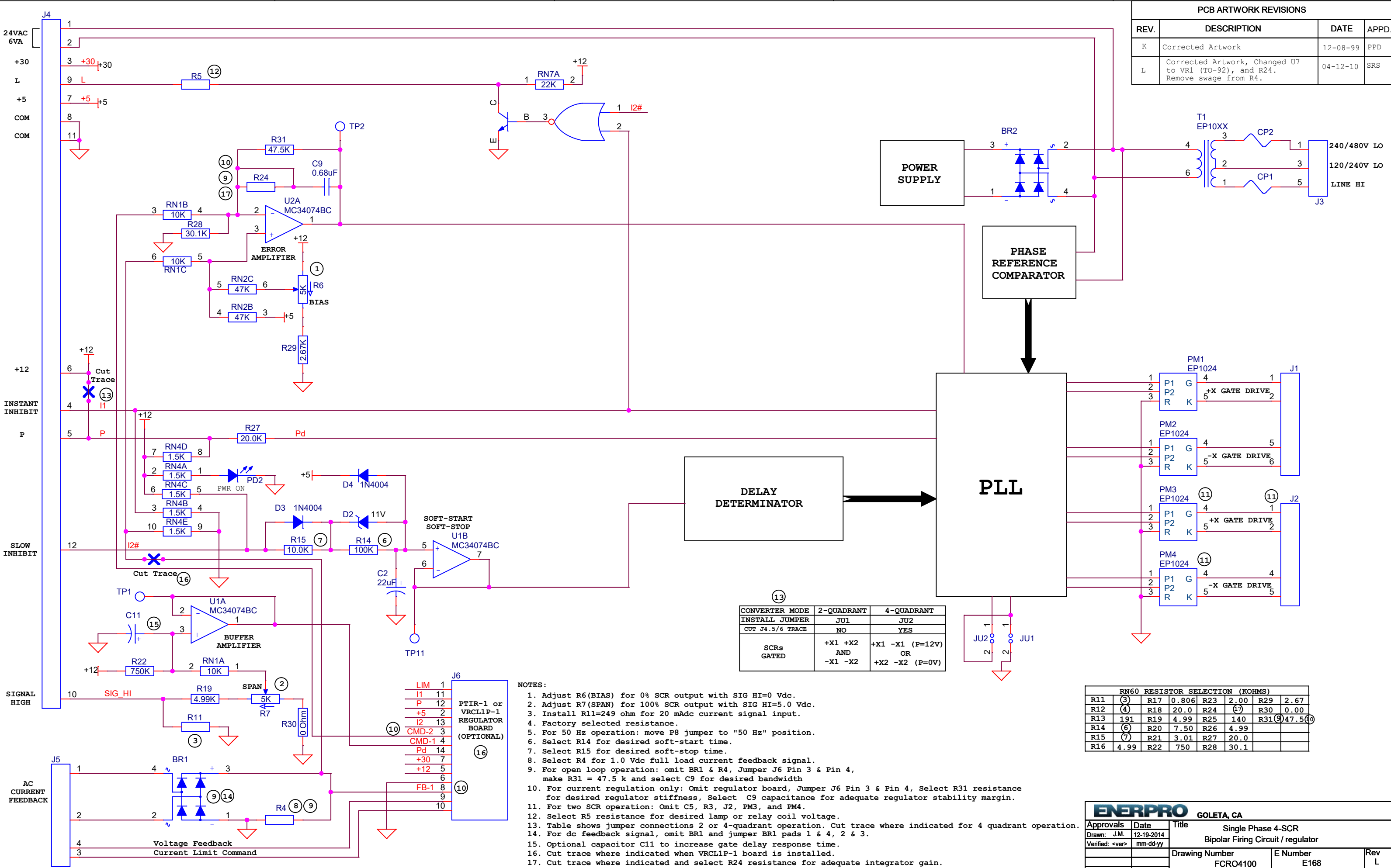


PCB ARTWORK REVISIONS			
REV.	DESCRIPTION	DATE	APPD.
K	Corrected Artwork	12-08-99	PPD
L	Corrected Artwork, Changed U7 to VR1 (TO-92), and R24. Remove swage from R4.	04-12-10	SRS



CONVERTER MODE	2-QUADRANT	4-QUADRANT
INSTALL JUMPER	JU1	JU2
CUT J4.5/6 TRACE	NO	YES
SCRs GATED	+X1 +X2 AND -X1 -X2	+X1 -X1 (P=12V) OR +X2 -X2 (P=0V)

RN60 RESISTOR SELECTION (KOHMS)					
R11 (3)	R17 0.806	R23 2.00	R29 2.67		
R12 (4)	R18 20.0	R24 (7)	R30 0.00		
R13 191	R19 4.99	R25 140	R31 (9) 47.5 (10)		
R14 (6)	R20 7.50	R26 4.99			
R15 (7)	R21 3.01	R27 20.0			
R16 4.99	R22 750	R28 30.1			

- NOTES:
- Adjust R6 (BIAS) for 0% SCR output with SIG HI=0 Vdc.
 - Adjust R7 (SPAN) for 100% SCR output with SIG HI=5.0 Vdc.
 - Install R11=249 ohm for 20 mAdc current signal input.
 - Factory selected resistance.
 - For 50 Hz operation: move P8 jumper to "50 Hz" position.
 - Select R14 for desired soft-start time.
 - Select R15 for desired soft-stop time.
 - Select R4 for 1.0 Vdc full load current feedback signal.
 - For open loop operation: omit BR1 & R4, Jumper J6 Pin 3 & Pin 4, make R31 = 47.5 k and select C9 for desired bandwidth.
 - For two SCR operation: Omit C5, R3, J2, PM3, and PM4.
 - Select R5 resistance for desired lamp or relay coil voltage.
 - Table shows jumper connections 2 or 4-quadrant operation. Cut trace where indicated for 4 quadrant operation.
 - Optional capacitor C11 to increase gate delay response time.
 - Cut trace where indicated when VRCLIP-1 board is installed.
 - Cut trace where indicated and select R24 resistance for adequate integrator gain.

ENERPRO GOLETA, CA

Approvals	Date	Title
Drawn: J.M.	12-19-2014	Single Phase 4-SCR Bipolar Firing Circuit / regulator
Verified: <ver>	mm-dd-yy	
	Drawing Number	E Number
	FCRO4100	E168
	Date: Monday, April 01, 2019	Sheet 1 of 2