PCB ARTWORK REVISIONS			
REV.	DESCRIPTION	DATE	

PHASE LOSS DETECTION

FREQUENCY COMPENSATION

PHASE REFERENCE ATTENUATORS AND FILTERS

DELAY DETERMINATOR

PLL

POWER SUPPLY

PLUG-IN BOARD CONNECTIONS

J6
En
El
PL#
A
B
C
N
CK2
Ad
CK1
+12
+5
COM
E
SIGHI
I1#
I2#
ES
+30
UNC

J3
UNC
I2#
I1#
SIGHI
ES
24VAC
24VAC
+30
+5
+12
COM
COM

D5 1N914
D4 9.1V
R36 100K
R28 10.0K
U4A MC34074BC
C11 22uF
R40 1.00K
R33 46.4K
D6 6.2V 1N5341B
C28 22uF
U4C MC34074BC
TP1
TP4
TP6
R2 220
D7 1N4004
R41 Select
R37 1.50K
R38 1.50K
R42 10.0K

R6 2.00M
R7 2.00M
R8 2.00M
RN7D 15K
RN7C 15K
RN7F 15K
RN7E 15K
RN7A 15K
RN7B 15K
RN7G 15K

J5 EXTERNAL PHASE REFERENCES

J7 TEST PHASE REFERENCES

PM1 EP1024
PM2 EP1024
PM3 EP1024
PM4 EP1024
PM5 EP1024
PM6 EP1024
P1 G
P2
R K

J1 GATE DRIVE FOR LINE TO LOAD SCRS

J2 GATE DRIVE FOR LINE TO LOAD SCRS

X1
Y1

J8 TO FCOAUX60 AUXILLIARY FIRING BOARD

T1 EP10XX
X2
Y2
CP2
CP1
J4

NOTES	
NO.	DESCRIPTION
1	For current signal input, select R42 to give SIGHI = +5V with maximum signal current.
2	Select R19 for disired PLL delay angle span, where aspan = amax - amin Select R21 and R22 for desired PLL delay angle bias, where abias = 90 - (amax + amin) / 2
3	Select R36 for desired soft start time. Select R28 for desired soft stop time.
4	For 120 Deg. burst gating, remove JU1; otherwise gating is 20-30 deg. burst mode.
5	Select R2 resistance to provide disired status relay or lamp voltage (optional)
6	For off-board phase references , install J5 and R6-R8 in place of T1.
7	For converter gating with 30 deg. phase shifted references, install RN6 = 120K (0.033uF for C17-C19) For controller gating with 0 deg. phase shifted references, install RN6 = 33K (0.033uF for C17-C19).
8	For gating paralleled SCRs, connect FCOAUX60 auxiliary firing board via cable to J8.
9	Refer buffer amplifier resistance table for sighi range other than 0 to 5V.
10	Make D6 a 11V Zener if SIGHI range other than 0 to 5V.
11	Select C28 capacitance in conjuction with SIGHI source resistance to reduce the firing circuit bandwidth (optional).
12	Jumper J6-9 to J6-19 to connect +12 to J3.5 (optional)
13	Select R14 resistance to make Vc = 5.00 +/- 0.05V at TP2 with f = 60Hz.
14	Optional 1.5K pullup resistor R41, connect I1# to COM for Instant Inhibit.

Buffer Amplifier Resistance Table

SIGHI Range	(9) Resistance in Kohms					
	R20	R23	R32	R33	R34	R42
0/5V (default)	100	32.4	130	46.4	1000	10.0
0.85/5.85V	100	32.4	196	46.4	1000	10.0
0/10V (10)	100	32.4	OMIT	90.9	750	10.0
0/2V	274	32.4	78.7	47.5	1000	10.0
4/20mA	100	32.4	130	46.4	1000	0.249

ENERPRO GOLETA, CA

Approvals	Date
Drawn: J.M.	02-11-19
Verified: <ver>	mm-dd-yy

Title: General Purpose 3-Phase Firing Circuit

Drawing Number: FCOG6100

E Number: E128

Rev: R

Date: Monday, February 11, 2019

Sheet 1 of 1