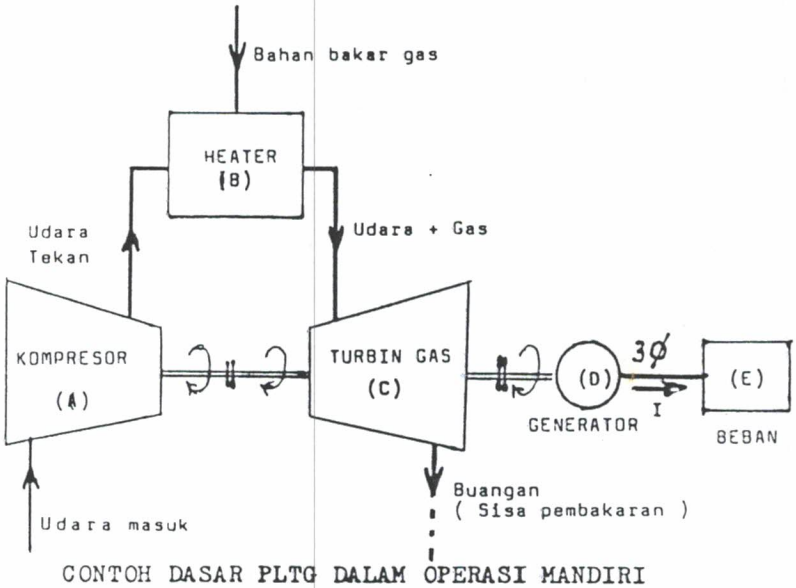
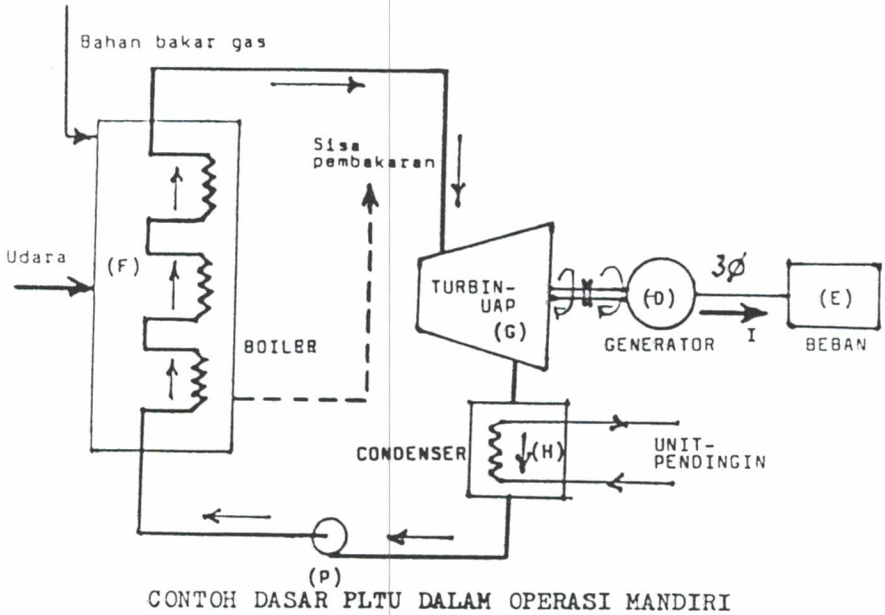
LAMPIRAN



CONTOH DASAR PLTG DALAM OPERASI MANDIRI



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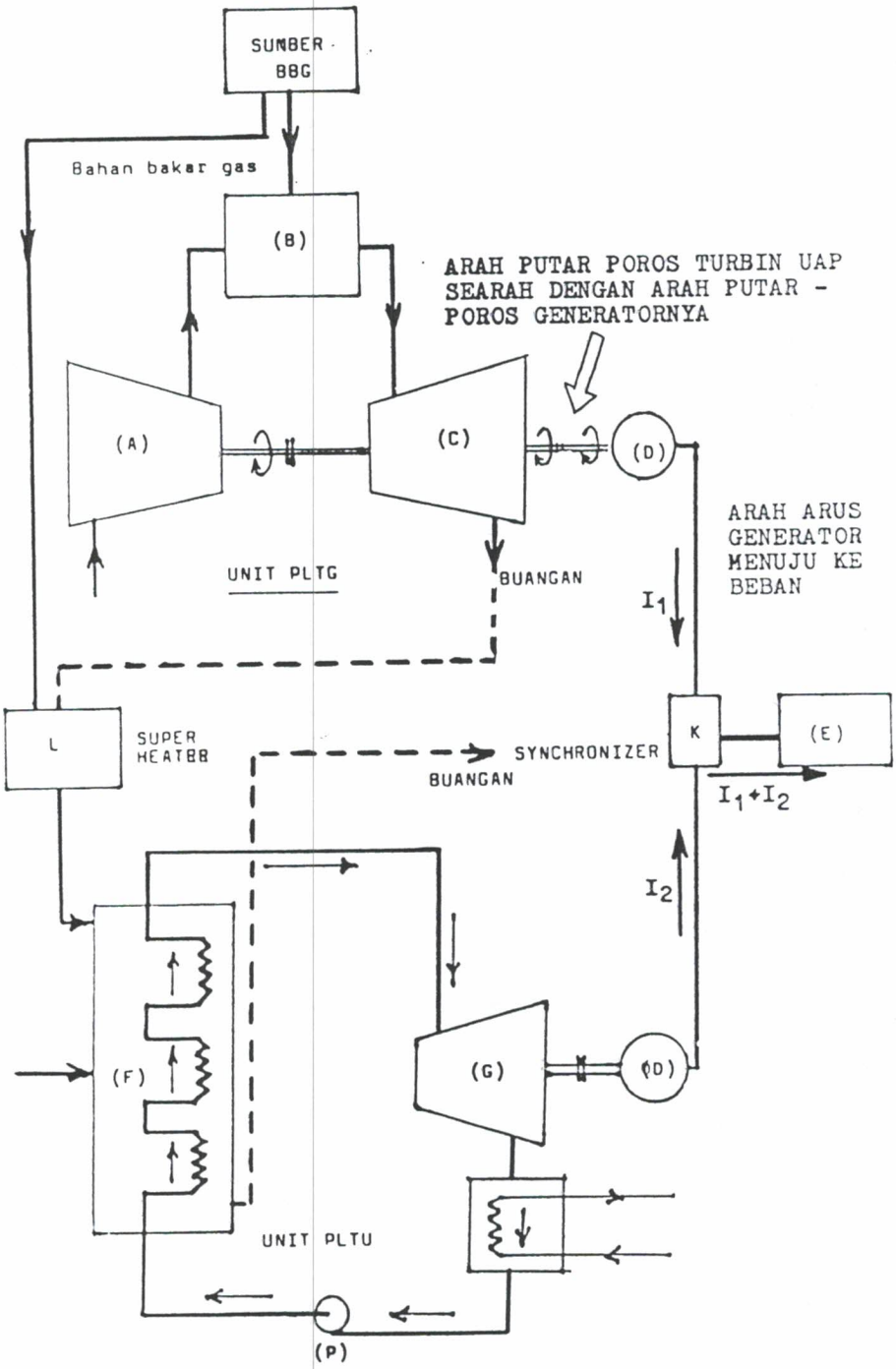
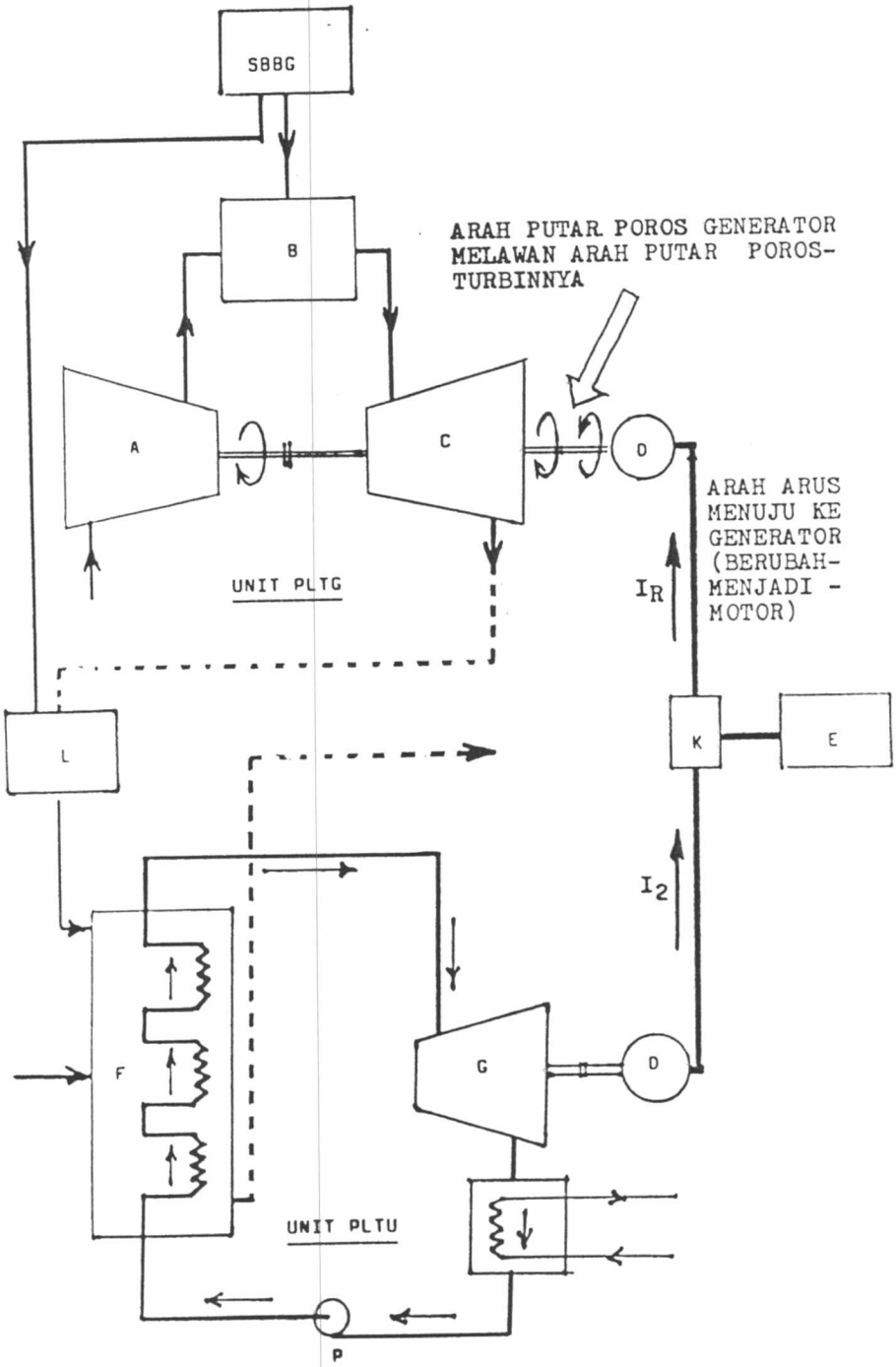


CONTOH SKEMA DASAR PEMBANGKIT KOMBINASI PLTG + PLTU
(= PLTGU)
DALAM KONDISI OPERASI NORMAL



CONTOH KASUS ARUS BALIK PADA SEBUAH PLTGU

HASIL PENGUKURAN RELE DAYA UNIT I

Fabrik	: TOSHIBA
Tipe	: CW01D - EG1
Rating	: 110 V , 5 A , 50 Hz
Range arus	: 0,35 - 1,4 A
Untuk pengaman	: G unit I
Ratio CT	: 8000 / 5 A
Ratio VT	: 13.200 / 110 V
Setting	: 1.0 A

1. PENGUJIAN ARUS KERJA

E = 110 V ; fasa I leading 30° terhadap E

Tap arus	Tap	Operate
91 A	1,0 A	0,7 A
91 B	1,0 A	0,7 A

2. PENGUJIAN KARAKTERISTIK

E = 110 V ; fasa I leading terhadap E

Arus lead	lead 30°	lead 90°	lead 330°
91 A	0,7 A	2,0 A	1,42 A
91 B	0,7 A	2,04 A	1,45 A

TABEL SETTING RELE PROTEKSI

ARUS BALIK GENERATOR

Nilai data setting	Nilai setting		
	GTG 1	GTG 2	GTG 3
FA/FN % = 4 -- 31,75	16	16	16
t/s I = 0,5 -- oo	1	1	1
II = 0,5 -- oo	1	1	1

2.3 Ordering data

Solid state reverse power protection 7RM34	Order No. 7RM34 □□ – □□□ 0 □
Rated current, rated frequency	
1 A, 50 Hz	1
1 A, 60 Hz	2
5 A, 50 Hz	5
5 A, 60 Hz	6
Auxiliary supply	
without dc-dc converter (The auxiliary voltage is taken from a central power supply) 1)	0
with dc-dc converter 24 V, 48 V dc	1
with dc-dc converter 60 V, 110 V, 125 V dc	2
with dc-dc converter 220 V, 250 V dc	3
Measurement voltage ⁷)	
3 x 100 V/ $\sqrt{3}$	0
3 x 120 V/ $\sqrt{3}$	2
Setting ranges P/P_N [%]	
0.4 to 3.575 %	A
0.8 to 7.15 %	B
4 to 35.75 %	C
Model ⁷)	
Rise-in-power relay -P_W >, reset ratio 0.6	A
Mechanical construction	
Casing 7XP10 for cubicle installation	1
Casing 7XP10 for surface mounting	4
Casing 7XP10 for flush mounting	5

1) Only possible for installation in cubicles.
⁷) Different designs can be delivered on request.

3 Technical data

3.1 Device data

Rated voltage U_N	100 V/ $\sqrt{3}$ or 120 V/ $\sqrt{3}$
Rated current I_N	1 A or 5 A
Rated frequency f_N	50 Hz or 60 Hz
Aux. dc voltage U_H	+24 V and ± 15 V dc or with converter 24/48 V, 60/110/125 V or 220/250 V dc
Power consumption	
in current path	< 0.1 VA
in voltage path	approx. 0.15 VA
in aux. voltage circuit	

without converter	L + (24 V)	L + (15 V)	L- (15 V)
quiescent approx.	1.4 W	0.4 W	0.6 W
energized approx.	6.1 W	0.5 W	0.6 W

with converter	
quiescent	approx. 6.6 W
energized	approx. 12.1 W
Thermal overload capacity	
in current path	
continuous	2 × I_N
1 s	20 × I_N
in voltage path	
continuous	2 × U_N
Setting ranges	
reverse power $-P_W$	0.4 to 3.575 % P_N. step: 0.025 % or 0.8 to 7.15 % P_N. step: 0.05 % or 4 to 35.75 % P_N: step: 0.25 %
delay time t_1, t_2	0.5 to 32 s, step: 0.5 s
Reset ratio	0.5 to 0.6
Pick-up tolerances	
power limit value	< ± 6 % of max. setting value with a reactive power component of ≤ 50 % of rated power
delay time t_1, t_2	< 3 % of setting value, however ≥ 10 ms
Shortest pick-up time	approx. 17 ms for power jump from P = 0 to P = 10 × setting value
Reset time	between 0.4 to 0.8 s depending on magnitude of current in pick-up direction

Input relays (for trip valve and reset) - Quantity - Voltage range (reconnectable) - Power consumption energized	 2 24 to 60 V dc / 110 to 250 V dc 0.075 to 1.7 W depending on operating voltage
The model for cubicle installation contains a test relay (24 V dc)	19 to 29 V dc; 0.075 W (at 24 V dc)
Trip relays - Quantity - Switching capacity MAKE - Switching capacity BREAK - Switching voltage - Permissible current, continuous 0.5 s - Power consumption, energized	 2 with 2 NO contacts each 1000 VA/W 30 VA/W max. 250 V 5 A 30 A 0.53 W (at 24 V dc)
Alarm relays - Quantity - Switching capacity MAKE - Switching capacity BREAK - Switching voltage - Permissible current continuous - Power consumption energized	 5 20 VA/W 20 VA/W 250 V 1 A 0.48 W (at 24 V dc)
Casing	7XP1040 (size 1/2)
Dimensions	refer Figs 2a to 2c
Weight	approx. 5 kg