

BAB V
NERACA PANAS

Kapasitas Produksi : 90.000 Ton/Tahun
 Operasi Pabrik : 300 Hari/Tahun
 Basis : 1 jam operasi
 Satuan : Kilo Joule (kJ)
 Temperatur Referensi : 25°C

5.1. Chiller (CH-01)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q2	3.038.222,8637	
Q3		598.436,5270
Qcw in	-1.854.474,9439	
Qcw out		585.311.3927
Total	1.183.747,9198	1.183.747,9198

5.2. Chiller (CH-02)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q5	1.633.580,9491	
Q6		193.646,4943
Qcw in	-1.094.490,2540	
Qcw out		345.444,2008
Total	539.090,6951	539.090,6951

5.3. Chiller (CH-03)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q29	3.361,4503	
Q30		151,5857
Qcw in	-2.439,8093	
Qcw out		770,00552
Total	921,6410	921,6410

5.4. Chiller (CH-04)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q40	13.276,3245	
Q6		13.011,6717
Qcw in	-201,1619	
Qcw out		63,4909
Total	13.075,1627	13.075,1627

5.5. Reaktor (R-01)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q7	792.083,0214	
Q8		672.486,2030
Qr		-209.555.152,3483
Qcw in	52.314.414,5643	
Qcw out		261.989.163,7310
Total	53.106.497,5857	53.106.497,5857

5.6. Cooler (CO-01)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q9	485.334,1175	
Q10		70.774,8134
Qcw in	103.433,6628	
Qcw out		517.992,9668
Total	588.767,7803	588.767,7803

5.7. Absorber (AB-01)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q10	70.774,9879	
Q11	116.657,8334	
Q22		1.576,3450
Q12		185.855,9781
Qr		0,4983
Total	187.432,8214	187.432,8214

5.8. Heater (H-01)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q12	185.855,9781	
Q13		3.876.640,8725
Qs in	10.433.459,2644	
Qs out		9.714.171,1597
Total	10.619.315,2424	10.619.315,2424

5.9. Kolom Destilasi (KD-01)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q13	905.144,0828	
Q14		-327.142,8460
Q19 (reboiler)		1.738.516,5663
Qc	6.789.841,8290	
Qv		6.283.612,1915
Total	7.694.985,9118	7.694.985,9118

5.10. Total Condensor (TC-01)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q13	-267.187,4349	
Q14 reflux		-39.489,3104
Q17		-227.698,1245
Qlaten	324.391,2013	
Qcw in	-246.568,8679	
Qcw out		77.822,3335
Total	-189.365,1015	-189.365,1015

5.11. Reboiler (RB-01)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q19	7.436.614,4165	
Q20		5.698.097,8502
Q21		1.738.402,5850
Qv		2.033.993,7761
Qs in	29.501.950,3987	
Qs out		27.468.070,7761
Total	36.938.564,8152	36.938.564,8152

5.12. Heater (H-02)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q23	-24.635,3440	
Q24		14.695,1114
Qs in	570.498,3886	
Qs out		531.167,9332
Total	545.863,0446	545.863,0446

5.13. Heater (H-03)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q25	21.138,7713	
Q26		21.143,1397
Qs in	63,3649	
Qs out		58,9965
Total	21.202,1362	21.202,1362

5.14. Absorber (AB-02)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q24	13.280,2013	
Q26	27.681,5063	
Q33		13.276,3245
Q27		31.236,6048
Qr		709.249,9103
Qs in	10.339.364,0564	
Qs out		9.626.562,9242
Total	10.380.325,7639	10.380.325,7639

5.15. Cooler (CO-02)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q31	15.956,7939	
Q32		27.681,5063
Qcw in	-2.925,3473	
Qcw out		-14.650,0597
Total	13.031,4465	13.031,4465

5.16. Heater (H-04)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q27	31.236,6048	
Q28		73.175,3845
Qs in	608.332,8032	
Qs out		566.394,0235
Total	639.569,4080	639.569,4080

5.17. Stripper (ST-01)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q28	73.175,3845	
Q29		3.361,4503
Q31		15.956,7939
Qr		696.324,9686
Qs in	9.319.161,3640	
Qs out		8.676.693,5357
TOTAL	9.392.336,7485	9.392.336,7485

5.18. Ekspander (EXP-01)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q8	672.486,2030	
Q9		485.334,1175
Qs in	-187.152,0854	
Total	485.334,1175	485.334,1175

5.19. Ekspander (EXP-02)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q22	1.576,3450	
Q23		-24.635,3440
Qs	-26.211,6891	
Total	-24.635,3440	-24.635,3440

5.20. Kompresor (K-01)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q1	63.457,3247	
Q2		3.038.222,8637
Q in	2.974.765,54	
Total	3.038.222,8637	3.038.222,8637

5.21. Kompresor (K-02)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q4	21.426,7203	
Q5		1.683.657,8694
Qs in	1.662.231,15	
Total	-301.172,5405	-301.172,5405

5.22. Kompresor (K-03)

Komponen	Input (kJ/jam)	Output (kJ/jam)
Q33	13.276,3245	
Q34		13.276,3245
Qs in	0	
Total	13.276,3245	13.276,3245