

LAMPIRAN

LAMPIRAN 1. Data Kualitas Uap Refrigeran Setelah Keluar Katup Ekspansi

Perhitungan Kualitas					
P_{in,exp}	P_{eva}	h_f	h_{fg}	h₄	X
1,134214	0,5033435	221,4	414,4	250,5	0,070222
1,134214	0,5033435	221,4	414,4	250,7	0,0707046
1,134214	0,5067908	221,5	414,5	250,9	0,0709288
1,2031616	0,5136856	221,9	414,9	251,6	0,0715835
1,2031616	0,5274751	222,1	414,1	251,7	0,0714803
1,21005636	0,5309225	222,2	414,2	252,3	0,0726702
1,21695112	0,5033435	221,4	414,4	252,6	0,0752896
1,22384588	0,5033435	221,4	414,4	253	0,0762548
1,2721092	0,5067908	221,5	414,5	253,5	0,0772014
1,2721092	0,5067908	221,5	414,5	253,8	0,0779252
1,2721092	0,5136856	221,9	414,9	254,1	0,0776091
1,3410568	0,5205804	222	414	254,5	0,0785024
1,4100044	0,4998961	221,4	414,4	255,5	0,0822876
1,4100044	0,5067908	221,5	414,5	255,6	0,0822678
1,4100044	0,5067908	221,5	414,5	255,7	0,082509
1,42379392	0,5205804	222	414	256	0,0821256
1,4444782	0,5309225	222,2	414,2	256,5	0,0828102
1,478952	0,5378173	222,4	414,4	257	0,0834942
1,5134258	0,5136856	221,9	414,9	258	0,0870089
1,5134258	0,5205804	222	414	258,3	0,0876812
1,5478996	0,5205804	222	414	258,5	0,0881643
1,5478996	0,5309225	222,2	414,2	258,6	0,0878803
1,5823734	0,5378173	222,4	414,4	258,9	0,0880792
1,6168472	0,5481594	222,6	414,6	259	0,0877955
1,6857948	0,5343699	222,3	414,3	258,8	0,0881004
1,651321	0,5343699	222,3	414,3	259	0,0885832
1,6857948	0,544712	222,5	414,5	259,5	0,0892642
1,6857948	0,5481594	222,6	414,6	260,2	0,0906898
1,7547424	0,5585015	222,8	414,8	260,5	0,0908872
1,7547424	0,5688437	223	415	261	0,0915663

Keterangan:

P_{in,exp} = Tekanan masuk katup ekspansi (MPa)

P_{eva} = Tekanan evaporasi pada sisi keluar katup ekspansi (MPa)

h_f = Entalpi cair jenuh pada tekanan masuk katup ekspansi (kJ/kg)

h_{fg} = Entalpi yang dibutuhkan untuk mengubah refrigeran dari cair jenuh menjadi uap jenuh (kJ/kg)

h_4 = Entalpi pada titik keluar katup ekspansi (kJ/kg)

LAMPIRAN 2. Kalibrasi Orifice

Percobaan	\dot{V}_{air}	\dot{V}_{air}	Pembacaan Manometer			ΔP (N/m ²)	v_1 (orifice) (m/s)	Re	$\dot{V}_{air,ideal}$	$\dot{V}_{air,aktual}$	Koefisien Curah (C)
	(LPM)	(m ³ /s)	Zkiri (cm)	Zkanan (cm)	ΔZ (cm)				(m ³ /dt)	(m ³ /s)	
1	0	0	74,5	74,5	0	0	0	0	0	0	
2	1	1,66667E-05	82,3	66,7	15,6	20.812,9	0,131568	1,671	2,02752E-05	1,66667E-05	0,82202
3	1,2	0,00002	86,4	62,6	23,8	31.753	0,157882	2,005	2,50433E-05	0,00002	0,79862
4	1,4	2,33333E-05	91	58	33	44.027,3	0,184196	2,339	2,9489E-05	2,33333E-05	0,79126
5	1,6	2,66667E-05	97	52	45	60.037,2	0,210509	2,673	3,44357E-05	2,66667E-05	0,77439
6	1,8	0,00003	104	45	59	78.715,4	0,236823	3,008	3,94302E-05	0,00003	0,76084
7	2	3,33333E-05	107	42	65	86.720,4	0,263137	3,342	4,13865E-05	3,33333E-05	0,80541

Keterangan:

\dot{V}_{air} = Debit air masuk saluran (m³/s)

Δz = Beda tinggi air raksa (cm)

ΔP = Beda tekanan sisi masuk dan keluar orifice (N/m²)/(Pa)

v_1 = Kecepatan alir air masuk saluran (m/s)

$\dot{V}_{air, ideal}$ = Debit air masuk ideal (m³/s)

$\dot{V}_{air, aktual}$ = Debit air masuk aktual (m³/s)

Re = Angka Reynolds

C = Koefisien curah

Diameter pipa tembaga, D_1 = 0,0127 m

Diameter lubang orifice, D_2 = 0,002 m

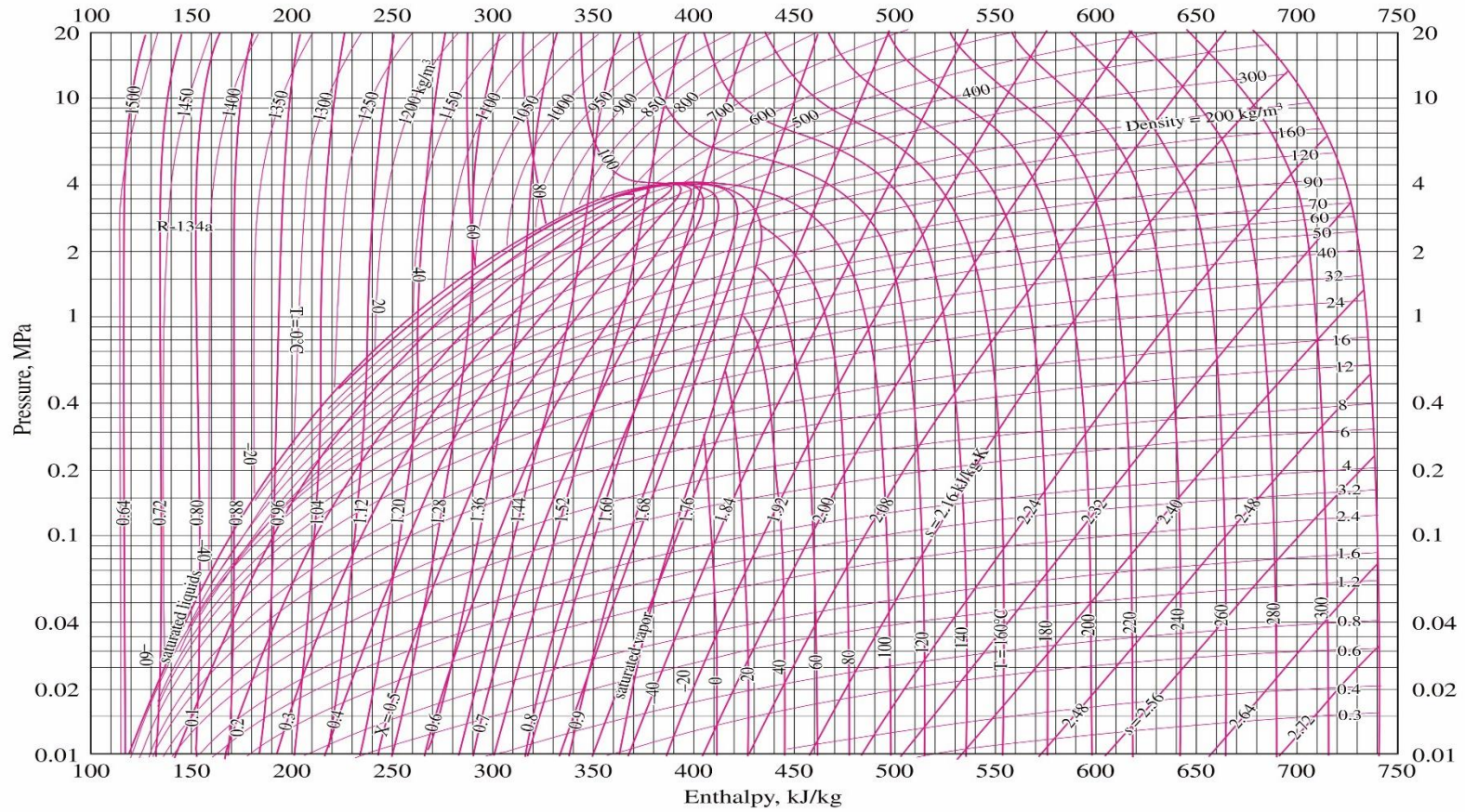
Luas penampang aliran, A_1 = 0,00013 m²

Luas penampang lubang orifice, A_2 = 0,00013 m²

Viskositas dinamik air, μ_{air} = 0,001 N.s/m²

Massa jenis air, ρ_{air} = 1.000 kg/m³

LAMPIRAN 3. Diagram P-h (Cengel, 1989)



LAMPIRAN 4. Tabel Persamaan Regresi Termokopel

Termokopel ke-	Persamaan Regresi	Termokopel ke-	Persamaan Regresi
T ₁	$y = 0.9787x + 0.3965$	T ₁₁	$y = 0.9726x + 0.7888$
T ₂	$y = 0.9733x + 0.5087$	T ₁₂	$y = 0.9709x + 0.773$
T ₃	$y = 0.9718x + 0.5279$	T ₁₃	$y = 0.9804x + 0.7632$
T ₄	$y = 0.9717x + 0.4745$	T ₁₄	$y = 0.9756x + 0.9866$
T ₅	$y = 0.9848x - 0.3787$	T ₁₅	$y = 0.9732x + 0.9362$
T ₆	$y = 0.9824x - 0.3608$	T ₁₆	$y = 0.9722x + 0.8744$
T ₇	$y = 0.9976x - 0.6447$	T ₁₇	$y = 0.9797x - 0.0533$
T ₈	$y = 0.9843x - 0.4043$	T ₁₈	$y = 0.9754x + 0.0219$
T ₉	$y = 0.9783x + 0.6538$	T ₁₉	$y = 0.9755x - 0.0445$
T ₁₀	$y = 0.9722x + 0.8294$	T ₂₀	$y = 0.9748x - 0.0637$

Keterangan:

- T₁ = Temperatur aliran refrigerant pada sisi masuk seksi uji
- T_{2, 3, 4} = Temperatur dinding pada sisi masuk seksi uji
- T₅ = Temperatur udara sebelum masuk seksi uji
- T₆ = Temperatur udara setelah masuk seksi uji
- T₇ = Temperatur aliran sisi hisap kompresor
- T₈ = Temperatur aliran sisi tekan kompresor
- T₉ = Temperatur aliran refrigerant pada sisi keluar seksi uji
- T_{10, 11, 12} = Temperatur dinding pada sisi keluar seksi uji
- T₁₃ = Temperatur aliran masuk katup ekspansi
- T₁₄ = Temperatur aliran keluar katup ekspansi
- T₁₅ = Temperatur aliran air keluar evaporator
- T₁₆ = Temperatur aliran air masuk evaporator
- T₁₇ = Temperatur aliran air keluar kondensor
- T₁₈ = Temperatur aliran air masuk kondensor
- T₁₉ = Temperatur air pada tangki campur
- T₂₀ = Temperatur air pada tangki utama

Indeks x adalah temperatur yang terbaca pada *termoreader*, temperatur yang terbaca tersebut disubstitusikan ke persamaan regresi pada masing-masing temperatur untuk mendapatkan temperatur hasil kalibrasi. Temperatur hasil kalibrasi diberi indeks y.

LAMPIRAN 5. Tabel Kalibrasi Termokopel

No	T Standard (°C)	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	T ₈	T ₉	T ₁₀	T ₁₁	T ₁₂	T ₁₃	T ₁₄	T ₁₅	T ₁₆	T ₁₇	T ₁₈	T ₁₉	T ₂₀
1	6	6	5.8	5.8	5.8	6.7	6.7	6.8	6.7	5.8	5.5	5.5	5.5	5.6	5.3	5.3	5.4	6.2	6.4	6.7	6.3
2	10	9.9	9.8	9.8	10	10.7	10.6	10.7	10.7	9.6	9.5	9.6	9.7	9.3	9.3	9.5	9.5	10.3	10.4	10.4	10.4
3	12	12.1	12	12	12.1	12.7	12.7	12.9	12.8	11.7	11.6	11.6	11.7	11.5	11.4	11.5	11.6	12.5	12.5	12.5	12.6
4	15	15.2	15.2	15.2	15.2	15.9	15.9	15.9	15.9	14.8	14.8	14.9	14.9	14.7	14.5	14.7	14.7	15.6	15.6	15.7	15.7
5	17	17	17	17	17.1	17.8	17.7	17.8	17.8	16.7	16.7	16.7	16.8	16.7	16.4	16.6	16.6	17.5	17.5	17.6	17.6
7	20	20.1	20	20.1	20.1	20.7	20.7	20.8	20.8	19.8	19.7	19.8	19.9	19.6	19.5	19.6	19.6	20.5	20.5	20.5	20.6
8	22	22.2	22.2	22.2	22.3	22.8	22.8	22.9	23	21.8	21.9	21.9	22	21.7	21.7	21.8	21.8	22.6	22.6	22.6	22.7
9	25	25	25.1	25.1	25.2	25.7	25.8	25.8	25.8	24.7	24.8	24.8	24.9	24.6	24.6	24.7	24.7	25.5	25.5	25.6	25.6
10	27	26.9	26.9	26.9	27	27.5	27.5	27.6	26.5	26.6	26.7	26.7	26.4	26.4	26.4	26.5	26.5	27.2	27.3	27.4	27.4
11	29	29	29.1	29.1	29.2	29.7	29.7	29.5	29.8	28.7	28.8	28.9	28.9	28.6	28.6	28.7	28.7	29.4	29.5	29.5	29.6
12	31	31.2	31.3	31.4	31.4	31.9	31.9	31.8	31.9	31	31	31.1	31.3	30.8	30.7	30.9	31	31.7	31.7	31.8	31.8
13	33	33.5	33.8	33.7	33.8	34.3	34.1	33.5	34.5	33.2	33.4	33.4	33.4	33.3	33	33.1	34.4	34	33.9	34	34
14	36	36.2	36.3	36.3	36.4	36.7	36.8	36.6	36.8	35.9	36.6	36.1	36.1	35.8	35.8	35.9	36	36.6	36.8	36.8	36.8
15	39	39.2	39.3	39.4	39.4	39.6	39.8	39.6	39.8	38.9	39	39	39.2	38.9	38.8	38.9	38.9	39.6	39.7	39.8	39.8
16	41	41.2	41.4	41.5	41.6	41.8	41.9	41.6	41.9	41.1	41.2	41.2	41.3	40.9	40.9	41.1	41.1	41.8	41.9	41.9	42
17	44	44.3	44.4	44.5	44.5	44.8	44.9	44.5	44.9	44.1	44.2	44.2	44.3	43.9	43.9	44.1	44.1	44.8	44.9	44.9	45
19	48	48.3	48.5	48.5	48.6	48.8	48.8	48.5	48.9	48	48.2	48.2	48.2	47.9	47.9	48	48.1	48.7	48.8	48.9	49
20	51	51.5	51.7	51.7	51.8	51.9	52	51.7	52.1	51.3	51.4	51.5	51.6	51.1	51.1	51.4	51.4	51.9	52.1	52.1	52.2
21	53	53.7	53.9	54	54	54.1	54.1	53.6	54.2	53.5	53.7	53.8	53.8	53.3	53.3	53.6	53.7	54.3	54.3	54.5	54.5
22	56	56.5	56.7	56.8	56.8	56.9	57	56.6	57	56.3	56.4	56.5	56.6	56	56.1	56.4	56.4	56.9	57.1	57.2	57.2
23	59	60	60.4	60.5	60.7	60.6	60.8	59.9	60.4	59.8	60.2	60.3	60.4	59.6	59.6	60.1	60.1	60.5	60.8	60.8	61
24	61	61.8	61.9	61.9	62.2	62.2	62.2	61.7	62.5	61.4	61.7	61.6	61.8	61.2	61.4	61.5	61.6	62.2	62.4	62.5	62.3
25	64	65.1	65.1	65.4	65.4	65.4	65.5	64.9	65.8	64.8	64.7	64.6	65.1	64.6	64.7	64.5	64.9	65.5	65.6	65.6	65.8
26	67	67.9	67.9	68.2	68	68.1	68.3	67.8	68.5	67.7	67.6	67.7	68	67.4	67.5	67.3	67.5	68.2	68.3	68.4	68.5
27	69	70.5	70.8	70.8	70.6	70.7	71	70.3	70.8	70.3	70.3	70.4	70.6	70	70.1	70.2	70.4	70.8	71.1	71.1	71.2
28	71	72.6	72.9	72.9	73.1	73.1	73.3	72.2	72.8	72.4	72.7	72.7	72.7	71.8	72.1	72.5	72.5	72.7	73.2	73.2	73.3
29	73	74.8	75	75	75.3	75.1	75.1	74.3	74.8	74.6	74.8	74.8	74.8	74.2	74.1	74.6	74.6	74.9	75.2	75.3	75.2

LAMPIRAN 6 Data Pengujian dan Perhitungan Keseluruhan

No	Inverter (Hz)	Rotameter (LPM)		$\dot{V}_{air, eva}$ (m ³ /s)	\dot{m}_{air} (kg/s)	ΔT (oC)	\dot{Q}_{evap} (J/s) (Watt)	Temperatur Kalibrasi (°C)			
		$\dot{V}_{air, eva}$	$\dot{V}_{air, kond}$					T ₁	T ₂	T ₃	T ₄
1	16	1	5.6	1.66667E-05	0.01666667	5.86603	412.577452	14.48978	15.49752	14.71618	14.66132
2	16	1.2	5.8	2E-05	0.02	5.76877	486.884198	15.17487	16.0815	15.20208	15.34151
3	16	1.4	5.8	2.33333E-05	0.02333333	5.76873	568.027625	15.46848	16.47082	15.39644	15.73019
4	16	1.6	5.5	2.66667E-05	0.02666667	5.57426	627.290071	15.85996	16.66548	15.88234	16.0217
5	16	1.8	5.3	3E-05	0.03	5.18531	656.460259	16.34931	16.95747	16.36824	16.60472
6	16	2	5.2	3.33333E-05	0.03333333	4.99081	702.040621	16.64292	17.34679	16.46542	16.89623
7	18	1	5.9	1.66667E-05	0.01666667	6.54642	460.431549	14.68552	15.49752	14.91054	15.05
8	18	1.2	5.8	2E-05	0.02	6.83808	577.133964	14.78339	15.49752	15.00772	15.05
9	18	1.4	5.6	2.33333E-05	0.02333333	6.74081	663.745105	14.97913	15.78951	15.29926	15.34151
10	18	1.6	5.5	2.66667E-05	0.02666667	6.54631	736.6781	15.37061	15.98417	15.49362	15.63302
11	18	1.8	5.3	3E-05	0.03	6.15736	779.521792	15.85996	16.47082	15.97952	16.11887
12	18	2	5.1	3.33333E-05	0.03333333	6.06009	852.452677	16.15357	16.66548	16.36824	16.50755
13	20	1	5.8	1.66667E-05	0.01666667	7.61571	535.638281	14.97913	15.69218	15.29926	15.34151
14	20	1.2	5.8	2E-05	0.02	8.10182	683.793622	15.37061	16.17883	15.5908	15.73019
15	20	1.4	5.6	2.33333E-05	0.02333333	7.71288	759.461599	15.85996	16.56815	15.97952	16.0217
16	20	1.6	5.4	2.66667E-05	0.02666667	6.74062	758.544453	16.15357	16.95747	16.27106	16.31321
17	20	1.8	5.2	3E-05	0.03	6.83779	865.664231	16.74079	17.34679	16.75696	16.89623
18	20	2	5	3.33333E-05	0.03333333	6.35162	893.461231	17.23014	18.0281	17.24286	17.47925
19	22	1	5.8	1.66667E-05	0.01666667	8.00445	562.979661	16.25144	17.24946	16.36824	16.41038
20	22	1.2	5.8	2E-05	0.02	8.49056	716.603278	16.44718	17.34679	16.46542	16.60472
21	22	1.4	5.7	2.33333E-05	0.02333333	8.39329	826.459305	16.64292	17.54145	16.75696	16.89623
22	22	1.6	5.5	2.66667E-05	0.02666667	7.90714	889.816839	16.93653	17.63878	17.14568	17.18774
23	22	1.8	5.4	3E-05	0.03	7.12931	902.570664	17.52375	18.22276	17.5344	17.67359
24	22	2	5.2	3.33333E-05	0.03333333	6.93482	975.498033	17.91523	18.41742	18.31184	18.25661
25	24	1	6	1.66667E-05	0.01666667	8.39323	590.323855	17.23014	18.0281	17.24286	17.38208
26	24	1.2	5.8	2E-05	0.02	8.97656	757.621679	17.32801	18.0281	17.34004	17.47925
27	24	1.4	5.8	2.33333E-05	0.02333333	8.78207	864.741177	17.81736	18.51475	17.92312	17.9651
28	24	1.6	5.6	2.66667E-05	0.02666667	8.19868	922.624808	18.20884	18.80674	18.31184	18.35378
29	24	1.8	5.6	3E-05	0.03	7.80974	988.713104	18.60032	19.19606	18.70056	18.74246
30	24	2	5.3	3.33333E-05	0.03333333	7.42081	1043.86063	19.08967	19.68271	19.08928	19.13114

LAMPIRAN 6 (lanjutan)

No	Inverter (Hz)	$\dot{V}_{air, eva}$ (LPM)	Temperatur Kalibrasi (°C)									
			T ₅	T ₆	T ₇	T ₈	T ₉	T ₁₀	T ₁₁	T ₁₂	T ₁₃	T ₁₄
1	16	1	23.7489	34.80912	13.3217	46.25152	14.83915	15.02352	15.08602	15.14232	31.74384	15.6206
2	16	1.2	23.94586	35.0056	14.02002	46.8421	15.52396	15.70406	15.66958	15.72486	32.23404	16.20596
3	16	1.4	24.04434	34.90736	14.51882	47.13739	15.71962	15.99572	15.96136	16.01613	32.43012	16.49864
4	16	1.6	24.14282	35.0056	14.71834	47.53111	16.01311	16.19016	16.15588	16.21031	32.52816	16.5962
5	16	1.8	24.33978	35.20208	15.11738	47.62954	16.40443	16.57904	16.64218	16.79285	32.72424	16.98644
6	16	2	23.45346	35.10384	15.41666	48.02326	16.89358	17.06514	17.12848	17.18121	33.1164	17.47424
7	18	1	23.94586	35.10384	12.72314	49.20442	15.03481	15.21796	15.18328	15.14232	33.41052	15.6206
8	18	1.2	23.84738	35.30032	12.92266	49.69657	15.03481	15.21796	15.28054	15.3365	33.80268	15.6206
9	18	1.4	24.04434	35.30032	13.12218	50.28715	15.23047	15.4124	15.57232	15.62777	34.29288	16.1084
10	18	1.6	23.45346	35.39856	13.3217	50.68087	15.62179	15.70406	15.66958	15.91904	34.68504	16.40108
11	18	1.8	24.2413	35.4968	13.72074	51.27145	16.01311	16.19016	16.25314	16.3074	35.0772	16.79132
12	18	2	24.43826	35.20208	13.8205	51.96046	16.40443	16.57904	16.64218	16.69576	35.0772	17.18156
13	20	1	23.55194	34.90736	11.8253	54.12592	15.3283	15.60684	15.57232	15.72486	35.27328	16.1084
14	20	1.2	24.04434	34.80912	12.8229	54.42121	15.42613	15.60684	15.66958	15.72486	35.76348	16.30352
15	20	1.4	24.04434	34.41616	13.02242	54.81493	15.71962	15.8985	15.96136	16.01613	36.0576	16.69376
16	20	1.6	24.2413	34.71088	13.3217	55.30708	16.11094	16.28738	16.3504	16.40449	36.25368	17.084
17	20	1.8	24.53674	34.80912	13.52122	55.89766	16.60009	16.77348	16.8367	16.88994	36.5478	17.5718
18	20	2	24.63522	34.61264	14.02002	56.48824	17.08924	17.25958	17.323	17.47248	36.64584	18.0596
19	22	1	24.14282	34.12144	12.62338	56.48824	16.01311	16.28738	16.3504	16.40449	36.93996	16.98644
20	22	1.2	24.2413	34.31792	12.92266	56.88196	16.20877	16.48182	16.54492	16.59867	37.33212	17.27912
21	22	1.4	24.33978	34.41616	13.12218	57.17725	16.40443	16.57904	16.64218	16.69576	37.72428	17.5718
22	22	1.6	24.53674	34.61264	12.92266	57.6694	16.79575	16.96792	17.03122	16.98703	37.92036	17.96204
23	22	1.8	24.33978	34.90736	14.02002	58.6537	17.48056	17.55124	17.51752	17.56957	38.21448	18.5474
24	22	2	25.02914	35.20208	14.21954	59.04742	17.77405	17.74568	17.90656	17.95793	38.5086	19.0352
25	24	1	24.83218	34.71088	12.92266	60.22858	16.99141	16.96792	17.12848	17.18121	38.60664	18.25472
26	24	1.2	24.83218	34.71088	13.12218	60.52387	16.99141	17.25958	17.22574	17.2783	38.9988	18.35228
27	24	1.4	24.83218	34.5144	13.22194	60.91759	17.2849	17.25958	17.51752	17.56957	39.39096	18.84008
28	24	1.6	25.02914	34.71088	13.8205	61.21288	17.87188	17.74568	18.00382	18.05502	39.68508	19.23032
29	24	1.8	25.2261	34.61264	14.02002	61.90189	18.16537	18.23178	18.49012	18.44338	39.88116	19.62056
30	24	2	25.32458	34.5144	14.41906	62.49247	18.55669	18.62066	18.7819	18.83174	39.9792	20.30348

LAMPIRAN 6 (lanjutan)

No	Inverter (Hz)	Rotameter(LPM)	Temperatur Kalibrasi (°C)						Temperatur Terbaca (°C)			
		$\dot{V}_{air,eva}$	T ₁₅	T ₁₆	T ₁₇	T ₁₈	T ₁₉	T ₂₀	T ₁	T ₂	T ₃	T ₄
1	16	1	26.11877	31.9848	32.57071	31.62486	31.5617	31.42234	14.4	15.4	14.6	14.6
2	16	1.2	26.50769	32.27646	32.86462	32.2101	31.85435	31.81226	15.1	16	15.1	15.3
3	16	1.4	26.89661	32.66534	33.45244	32.60026	32.5372	32.20218	15.4	16.4	15.3	15.7
4	16	1.6	27.1883	32.76256	33.74635	32.89288	32.9274	32.5921	15.8	16.6	15.8	16
5	16	1.8	27.86891	33.05422	34.13823	33.1855	32.9274	32.78706	16.3	16.9	16.3	16.6
6	16	2	28.45229	33.4431	34.43214	33.57566	33.41515	33.0795	16.6	17.3	16.4	16.9
7	18	1	27.57722	34.12364	35.11793	34.35598	34.39065	33.85934	14.6	15.4	14.8	15
8	18	1.2	27.57722	34.4153	35.80372	34.74614	34.78085	34.34674	14.7	15.4	14.9	15
9	18	1.4	28.06337	34.80418	36.09763	35.23384	34.8784	34.63918	14.9	15.7	15.2	15.3
10	18	1.6	28.64675	35.19306	36.68545	35.624	35.17105	35.0291	15.3	15.9	15.4	15.6
11	18	1.8	29.32736	35.48472	36.88139	35.91662	35.75635	35.32154	15.8	16.4	15.9	16.1
12	18	2	29.81351	35.8736	37.27327	36.1117	36.2441	35.22406	16.1	16.6	16.3	16.5
13	20	1	28.84121	36.45692	37.76312	36.69694	36.6343	36.0039	14.9	15.6	15.2	15.3
14	20	1.2	28.74398	36.8458	38.25297	37.28218	37.12205	36.58878	15.3	16.1	15.5	15.7
15	20	1.4	29.32736	37.04024	39.1347	37.67234	37.51225	36.9787	15.8	16.5	15.9	16
16	20	1.6	29.91074	36.65136	39.1347	37.86742	37.8049	37.07618	16.1	16.9	16.2	16.3
17	20	1.8	30.39689	37.23468	39.33064	38.0625	37.70735	37.36862	16.7	17.3	16.7	16.9
18	20	2	31.0775	37.42912	39.42861	38.25758	38	37.4661	17.2	18	17.2	17.5
19	22	1	30.20243	38.20688	39.91846	38.74528	38.87795	37.9535	16.2	17.2	16.3	16.4
20	22	1.2	30.1052	38.59576	40.1144	39.0379	38.9755	36.88122	16.4	17.3	16.4	16.6
21	22	1.4	30.59135	38.98464	40.31034	39.13544	38.87795	38.34342	16.6	17.5	16.7	16.9
22	22	1.6	31.0775	38.98464	41.0941	39.81822	39.3657	39.02578	16.9	17.6	17.1	17.2
23	22	1.8	31.75811	38.88742	41.68192	40.30592	39.3657	39.31822	17.5	18.2	17.5	17.7
24	22	2	32.24426	39.17908	41.87786	40.501	40.63385	39.70814	17.9	18.4	18.3	18.3
25	24	1	31.17473	39.56796	42.36771	41.18378	40.9265	40.29302	17.2	18	17.2	17.4
26	24	1.2	31.0775	40.05406	42.75959	41.67148	41.7069	40.68294	17.3	18	17.3	17.5
27	24	1.4	31.56365	40.34572	43.24944	41.86656	41.7069	40.8779	17.8	18.5	17.9	18
28	24	1.6	32.24426	40.44294	43.54335	42.15918	41.5118	41.17034	18.2	18.8	18.3	18.4
29	24	1.8	32.82764	40.63738	43.64132	42.25672	42.0971	41.26782	18.6	19.2	18.7	18.8
30	24	2	33.31379	40.7346	44.52305	42.25672	42.4873	41.56026	19.1	19.7	19.1	19.2

LAMPIRAN 6 (lanjutan)

No	Inverter (Hz)	$\dot{V}_{air, eva}$ (LPM)	Temperatur Terbaca (°C)									
			T ₅	T ₆	T ₇	T ₈	T ₉	T ₁₀	T ₁₁	T ₁₂	T ₁₃	T ₁₄
1	16	1	24.5	35.8	14	47.4	14.5	14.6	14.7	14.8	31.6	15
2	16	1.2	24.7	36	14.7	48	15.2	15.3	15.3	15.4	32.1	15.6
3	16	1.4	24.8	35.9	15.2	48.3	15.4	15.6	15.6	15.7	32.3	15.9
4	16	1.6	24.9	36	15.4	48.7	15.7	15.8	15.8	15.9	32.4	16
5	16	1.8	25.1	36.2	15.8	48.8	16.1	16.2	16.3	16.5	32.6	16.4
6	16	2	24.2	36.1	16.1	49.2	16.6	16.7	16.8	16.9	33	16.9
7	18	1	24.7	36.1	13.4	50.4	14.7	14.8	14.8	14.8	33.3	15
8	18	1.2	24.6	36.3	13.6	50.9	14.7	14.8	14.9	15	33.7	15
9	18	1.4	24.8	36.3	13.8	51.5	14.9	15	15.2	15.3	34.2	15.5
10	18	1.6	24.2	36.4	14	51.9	15.3	15.3	15.3	15.6	34.6	15.8
11	18	1.8	25	36.5	14.4	52.5	15.7	15.8	15.9	16	35	16.2
12	18	2	25.2	36.2	14.5	53.2	16.1	16.2	16.3	16.4	35	16.6
13	20	1	24.3	35.9	12.5	55.4	15	15.2	15.2	15.4	35.2	15.5
14	20	1.2	24.8	35.8	13.5	55.7	15.1	15.2	15.3	15.4	35.7	15.7
15	20	1.4	24.8	35.4	13.7	56.1	15.4	15.5	15.6	15.7	36	16.1
16	20	1.6	25	35.7	14	56.6	15.8	15.9	16	16.1	36.2	16.5
17	20	1.8	25.3	35.8	14.2	57.2	16.3	16.4	16.5	16.6	36.5	17
18	20	2	25.4	35.6	14.7	57.8	16.8	16.9	17	17.2	36.6	17.5
19	22	1	24.9	35.1	13.3	57.8	15.7	15.9	16	16.1	36.9	16.4
20	22	1.2	25	35.3	13.6	58.2	15.9	16.1	16.2	16.3	37.3	16.7
21	22	1.4	25.1	35.4	13.8	58.5	16.1	16.2	16.3	16.4	37.7	17
22	22	1.6	25.3	35.6	13.6	59	16.5	16.6	16.7	16.7	37.9	17.4
23	22	1.8	25.1	35.9	14.7	60	17.2	17.2	17.2	17.3	38.2	18
24	22	2	25.8	36.2	14.9	60.4	17.5	17.4	17.6	17.7	38.5	18.5
25	24	1	25.6	35.7	13.6	61.6	16.7	16.6	16.8	16.9	38.6	17.7
26	24	1.2	25.6	35.7	13.8	61.9	16.7	16.9	16.9	17	39	17.8
27	24	1.4	25.6	35.5	13.9	62.3	17	16.9	17.2	17.3	39.4	18.3
28	24	1.6	25.8	35.7	14.5	62.6	17.6	17.4	17.7	17.8	39.7	18.7
29	24	1.8	26	35.6	14.7	63.3	17.9	17.9	18.2	18.2	39.9	19.1
30	24	2	26.1	35.5	15.1	63.9	18.3	18.3	18.5	18.6	40	19.8

LAMPIRAN 6 (lanjutan)

No	Inverter (Hz)	Rotameter (LPM)	Temperatur Terbaca (°C)						RPM		Tekanan (Mpa)(Abs)	
		$\dot{V}_{air,eva}$	T ₁₅	T ₁₆	T ₁₇	T ₁₈	T ₁₉	T ₂₀	MOTOR	KOMPRESOR	P ₁	P ₂
1	16	1	25.9	32	33.3	32.4	32.4	32.3	434.9	304.5	0.45163276	1.134214
2	16	1.2	26.3	32.3	33.6	33	32.7	32.7	429.5	300.8	0.45852752	1.134214
3	16	1.4	26.7	32.7	34.2	33.4	33.4	33.1	429.5	300.8	0.45852752	1.134214
4	16	1.6	27	32.8	34.5	33.7	33.8	33.5	428.6	300.3	0.47231704	1.2031616
5	16	1.8	27.7	33.1	34.9	34	33.8	33.7	426.9	299.5	0.48610656	1.2031616
6	16	2	28.3	33.5	35.2	34.4	34.3	34	424.5	297.3	0.48610656	1.21005636
7	18	1	27.4	34.2	35.9	35.2	35.3	34.8	484.1	339	0.444738	1.21695112
8	18	1.2	27.4	34.5	36.6	35.6	35.7	35.3	483.7	339.2	0.444738	1.22384588
9	18	1.4	27.9	34.9	36.9	36.1	35.8	35.6	482.2	337.4	0.444738	1.2721092
10	18	1.6	28.5	35.3	37.5	36.5	36.1	36	480.2	335.8	0.45163276	1.2721092
11	18	1.8	29.2	35.6	37.7	36.8	36.7	36.3	478	334.5	0.45163276	1.2721092
12	18	2	29.7	36	38.1	37	37.2	36.2	476.2	330	0.45163276	1.3410568
13	20	1	28.7	36.6	38.6	37.6	37.6	37	533.9	373.5	0.444738	1.4100044
14	20	1.2	28.6	37	39.1	38.2	38.1	37.6	534	373.1	0.444738	1.4100044
15	20	1.4	29.2	37.2	40	38.6	38.5	38	532	372.1	0.444738	1.4100044
16	20	1.6	29.8	36.8	40	38.8	38.8	38.1	530.6	371	0.45852752	1.42379392
17	20	1.8	30.3	37.4	40.2	39	38.7	38.4	529.4	369.1	0.46542228	1.4444782
18	20	2	31	37.6	40.3	39.2	39	38.5	525.6	367.5	0.4792118	1.478952
19	22	1	30.1	38.4	40.8	39.7	39.9	39	584	408.7	0.444738	1.5134258
20	22	1.2	30	38.8	41	40	40	37.9	585.5	408.3	0.444738	1.5134258
21	22	1.4	30.5	39.2	41.2	40.1	39.9	39.4	584.1	407.4	0.45163276	1.5478996
22	22	1.6	31	39.2	42	40.8	40.4	40.1	582.8	406.5	0.45852752	1.5478996
23	22	1.8	31.7	39.1	42.6	41.3	40.4	40.4	580	403.8	0.47231704	1.5823734
24	22	2	32.2	39.4	42.8	41.5	41.7	40.8	578.2	403	0.4792118	1.6168472
25	24	1	31.1	39.8	43.3	42.2	42	41.4	635	443.3	0.45852752	1.6857948
26	24	1.2	31	40.3	43.7	42.7	42.8	41.8	636.2	443.5	0.45852752	1.651321
27	24	1.4	31.5	40.6	44.2	42.9	42.8	42	635	442.5	0.45852752	1.6857948
28	24	1.6	32.2	40.7	44.5	43.2	42.6	42.3	635.1	441.9	0.47231704	1.6857948
29	24	1.8	32.8	40.9	44.6	43.3	43.2	42.4	631.2	441.4	0.4792118	1.7547424
30	24	2	33.3	41	45.5	43.3	43.6	42.7	630	437.5	0.48610656	1.7547424

LAMPIRAN 6 (lanjutan)

No	Inverter (Hz)	Rotameter (LPM)	Tekanan (Mpa)(Abs)				V.UDARA (m/s)	RAKSA (cm)	z1	z2	Inverter		Waktu (Menit)
			V _{air,eva}	P ₃	P ₄	P ₅					P ₆	Arus (A)	
1	16	1	0.52747512	0.49989608	0.50679084	1.21005636	3.6	77.4	73.4	3.6	130	5	
2	16	1.2	0.52747512	0.49989608	0.50679084	1.2721092	3.6	77.75	73.25	3.6	130	5	
3	16	1.4	0.54126464	0.49989608	0.5136856	1.2721092	3.6	77.8	73.3	3.6	130	5	
4	16	1.6	0.54126464	0.5136856	0.5136856	1.2721092	3.6	78	73.2	3.6	130	5	
5	16	1.8	0.55505416	0.53436988	0.52058036	1.28589872	3.6	78	73.2	3.6	130	5	
6	16	2	0.56884368	0.53436988	0.52747512	1.28589872	3.6	78.3	73.5	3.6	130	5	
7	18	1	0.52747512	0.49989608	0.50679084	1.3410568	3.6	77.8	73.3	3.7	142	5	
8	18	1.2	0.52747512	0.50679084	0.49989608	1.3410568	3.6	78	73.4	3.7	142	5	
9	18	1.4	0.52747512	0.5136856	0.49989608	1.35484632	3.6	78.1	73.3	3.7	142	5	
10	18	1.6	0.54126464	0.5136856	0.49989608	1.4100044	3.6	78.2	73.2	3.7	142	5	
11	18	1.8	0.54126464	0.5136856	0.5136856	1.4100044	3.6	78.3	73.1	3.7	142	5	
12	18	2	0.55505416	0.52747512	0.5136856	1.4100044	3.6	78.5	73	3.7	142	5	
13	20	1	0.53436988	0.49989608	0.49989608	1.49274152	3.6	77.3	73	3.9	156	5	
14	20	1.2	0.54126464	0.5136856	0.49989608	1.478952	3.6	78.3	72.9	3.9	156	5	
15	20	1.4	0.54126464	0.5136856	0.49989608	1.5134258	3.6	78.4	72.9	3.9	156	5	
16	20	1.6	0.54126464	0.52747512	0.5136856	1.52721532	3.6	78.4	72.9	3.9	156	5	
17	20	1.8	0.55505416	0.54126464	0.52058036	1.5478996	3.6	78.5	72.8	3.9	156	5	
18	20	2	0.56884368	0.5481594	0.52747512	1.56858388	3.6	78.6	72.1	3.9	156	5	
19	22	1	0.54126464	0.5136856	0.5136856	1.6168472	3.6	78.6	72.5	4.1	172	5	
20	22	1.2	0.55505416	0.52747512	0.5136856	1.63063672	3.6	78.8	72.6	4.1	172	5	
21	22	1.4	0.56884368	0.52747512	0.5136856	1.64442624	3.6	79	72.5	4.1	172	5	
22	22	1.6	0.56884368	0.54126464	0.52058036	1.65821576	3.6	79	72.5	4.1	172	5	
23	22	1.8	0.56884368	0.54126464	0.53436988	1.70647908	3.6	79	72.5	4.1	172	5	
24	22	2	0.5826332	0.55505416	0.54126464	1.73405812	3.6	79.2	72.2	4.1	172	5	
25	24	1	0.56884368	0.54126464	0.52747512	1.76853192	3.6	79.5	72	4.3	184	5	
26	24	1.2	0.56884368	0.54126464	0.52747512	1.78232144	3.6	79.5	72	4.3	184	5	
27	24	1.4	0.56884368	0.5481594	0.54126464	1.7892162	3.6	79.5	72	4.3	184	5	
28	24	1.6	0.5826332	0.55505416	0.54126464	1.82369	3.6	79.5	72	4.3	184	5	
29	24	1.8	0.5826332	0.56884368	0.5481594	1.83747952	3.6	79.5	72	4.3	184	5	
30	24	2	0.61021224	0.57573844	0.56194892	1.87884808	3.6	80	71.75	4.3	184	5	

LAMPIRAN 6 (lanjutan)

No	Inverter (Hz)	Rotameter (LPM) $\dot{V}_{air, eva}$	Daya Kompresor (Watt)	Δh Raksa (cm)	ΔP Orifice (Pa)	Perhitungan \dot{m}_R					
						Re	C	ρ_R (kg/m ³)	\dot{V}_{ideal} (m ³ /s)	V_{aktual} (m ³ /s)	\dot{m}_R (g/s)
1	16	1	468	4	5336.64	6827.49337	0.84735404	1169	9.49566E-06	8.04619E-06	9.4059914
2	16	1.2	468	4.5	6003.72	6908.97675	0.84608831	1168	1.0076E-05	8.52517E-06	9.9573964
3	16	1.4	468	4.5	6003.72	6908.97675	0.84608831	1167	1.00803E-05	8.52882E-06	9.9531329
4	16	1.6	468	4.8	6403.968	6957.86678	0.84533691	1166	1.04153E-05	8.80448E-06	10.2660211
5	16	1.8	468	4.8	6403.968	6957.86678	0.84533691	1166	1.04153E-05	8.80448E-06	10.2660211
6	16	2	468	4.8	6403.968	6957.86678	0.84533691	1165	1.04198E-05	8.80826E-06	10.2616179
7	18	1	525.4	4.5	6003.72	6908.97675	0.84608831	1164	1.00933E-05	8.5398E-06	9.94033144
8	18	1.2	525.4	4.6	6137.136	6925.27343	0.84583718	1163	1.02092E-05	8.63532E-06	10.042873
9	18	1.4	525.4	4.8	6403.968	6957.86678	0.84533691	1162	1.04333E-05	8.81962E-06	10.248397
10	18	1.6	525.4	5	6670.8	6990.46014	0.84483928	1162	1.06484E-05	8.99619E-06	10.453569
11	18	1.8	525.4	5.2	6937.632	7023.05349	0.84434425	1161	1.0864E-05	9.17292E-06	10.6497584
12	18	2	525.4	5.5	7337.88	7071.94352	0.84360654	1161	1.11729E-05	9.42557E-06	10.9430861
13	20	1	608.4	4.3	5736.888	6876.3834	0.84659257	1160	9.88343E-06	8.36724E-06	9.70599583
14	20	1.2	608.4	5.4	7204.464	7055.64684	0.8438518	1160	1.10757E-05	9.34623E-06	10.8416275
15	20	1.4	608.4	5.5	7337.88	7071.94352	0.84360654	1159	1.11826E-05	9.4337E-06	10.9336565
16	20	1.6	608.4	5.5	7337.88	7071.94352	0.84360654	1158	1.11874E-05	9.43777E-06	10.9289386
17	20	1.8	608.4	5.7	7604.712	7104.53687	0.84311791	1157	1.13939E-05	9.60642E-06	11.1146259
18	20	2	608.4	6.5	8672.04	7234.91028	0.84118835	1156	1.21725E-05	1.02394E-05	11.8367171
19	22	1	705.2	6.1	8138.376	7169.72358	0.84214819	1156	1.1792E-05	9.93063E-06	11.4798121
20	22	1.2	705.2	6.2	8271.792	7186.02025	0.84190731	1156	1.18883E-05	1.00088E-05	11.570216
21	22	1.4	705.2	6.5	8672.04	7234.91028	0.84118835	1155	1.21778E-05	1.02438E-05	11.8315963
22	22	1.6	705.2	6.5	8672.04	7234.91028	0.84118835	1155	1.21778E-05	1.02438E-05	11.8315963
23	22	1.8	705.2	6.5	8672.04	7234.91028	0.84118835	1155	1.21778E-05	1.02438E-05	11.8315963
24	22	2	705.2	7	9339.12	7316.39366	0.84000214	1154	1.2643E-05	1.06201E-05	12.2556046
25	24	1	791.2	7.5	10006.2	7397.87704	0.83883072	1154	1.30867E-05	1.09775E-05	12.6680652
26	24	1.2	791.2	7.5	10006.2	7397.87704	0.83883072	1153	1.30924E-05	1.09823E-05	12.6625752
27	24	1.4	791.2	7.5	10006.2	7397.87704	0.83883072	1153	1.30924E-05	1.09823E-05	12.6625752
28	24	1.6	791.2	7.5	10006.2	7397.87704	0.83883072	1152	1.30981E-05	1.09871E-05	12.6570829
29	24	1.8	791.2	7.5	10006.2	7397.87704	0.83883072	1152	1.30981E-05	1.09871E-05	12.6570829
30	24	2	791.2	8.25	11006.82	7520.10212	0.83710056	1152	1.37374E-05	1.14995E-05	13.24748

LAMPIRAN 6 (lanjutan)

No	Inverter (Hz)	Rotameter (LPM)	Debit Aliran Refrigeran (m ³ /s)	Debit Aliran Refrigeran (LPM)	Nilai h (entalpi)				COP	Q _{evap} (J/s) (Watt)
		$\dot{V}_{air, eva}$			h ₁ (in kompresor)	h ₂ (in kondensor)	h ₃ = h ₄ (in evaporator)	(h ₂ -h ₁)		
1	16	1	8.04619E-06	0.48180754	411	426	250.5	15	2.92421737	412.577452
2	16	1.2	8.52517E-06	0.51048911	411.4	426.5	250.7	15.1	3.23819454	486.884198
3	16	1.4	8.52882E-06	0.51070778	411.6	426.6	250.9	15	3.80468228	568.027625
4	16	1.6	8.80448E-06	0.52721424	412	426.8	251.6	14.8	4.12861652	627.290071
5	16	1.8	8.80448E-06	0.52721424	413	427	251.7	14	4.5674968	656.460259
6	16	2	8.80826E-06	0.52744046	413.4	427.2	252.3	13.8	4.95755242	702.040621
7	18	1	8.5398E-06	0.51136549	409.4	428	252.6	18.6	2.49029768	460.431549
8	18	1.2	8.63532E-06	0.51708481	409.7	428.3	253	18.6	3.08962464	577.133964
9	18	1.4	8.81962E-06	0.52812088	410.2	428.7	253.5	18.5	3.50085127	663.745105
10	18	1.6	8.99619E-06	0.53869382	411	429	253.8	18	3.91508023	736.6781
11	18	1.8	9.17292E-06	0.54927656	411.5	429.3	254.1	17.8	4.11214577	779.521792
12	18	2	9.42557E-06	0.56440535	411.8	429.5	254.5	17.7	4.40105906	852.452677
13	20	1	8.36724E-06	0.5010322	409	430	255.5	21	2.62792044	535.638281
14	20	1.2	9.34623E-06	0.55965453	409.6	430	255.6	20.4	3.09172171	683.793622
15	20	1.4	9.4337E-06	0.56489212	410.5	431	255.7	20.5	3.3883365	759.461599
16	20	1.6	9.43777E-06	0.56513598	411.3	431.4	256	20.1	3.45308281	758.544453
17	20	1.8	9.60642E-06	0.57523462	412	431.7	256.5	19.7	3.95356059	865.664231
18	20	2	1.02394E-05	0.61313621	412.5	432	257	19.5	3.87088112	893.461231
19	22	1	9.93063E-06	0.5946487	409.4	431.5	258	22.1	2.21904267	562.979661
20	22	1.2	1.00088E-05	0.59933158	410.3	431.7	258.3	21.4	2.89416675	716.603278
21	22	1.4	1.02438E-05	0.61340157	410.7	432	258.5	21.3	3.27943123	826.459305
22	22	1.6	1.02438E-05	0.61340157	411.4	432.5	258.6	21.1	3.5643047	889.816839
23	22	1.8	1.02438E-05	0.61340157	411.6	432.6	258.9	21	3.63260835	902.570664
24	22	2	1.06201E-05	0.63593461	411.8	432.7	259	20.9	3.80842466	975.498033
25	24	1	1.09775E-05	0.65733689	410.5	434	258.8	23.5	1.98295191	590.323855
26	24	1.2	1.09823E-05	0.65762189	411.2	434.5	259	23.3	2.56787828	757.621679
27	24	1.4	1.09823E-05	0.65762189	411.3	434.5	259.5	23.2	2.94358185	864.741177
28	24	1.6	1.09871E-05	0.65790725	412	435	260.2	23	3.16930232	922.624808
29	24	1.8	1.09871E-05	0.65790725	412.5	435.5	260.5	23	3.39632178	988.713104
30	24	2	1.14995E-05	0.68859572	413	435.6	261	22.6	3.48658941	1043.86063

