

DAFTAR PUSTAKA

Doosat, R.J.,1981, *Principle of Refrigeration*, John Wiley & Sons, New-York

William C.Whitman, William M.Jhonson,Jhon A.Tomczyk, Eugene Silberstein, 2008, *Refrigeration & Air Conditioning Technology*, Delmar, United States of America

Stoecker W.F., Jones J.W., 1982, *Refrigerasi dan Pengkondisian Udara*,Airlangga, Jakarta

HVAC SYSTEM TESTING, ADJUSTING & BALANCING (3rd Edition), 2002, U.S.A, Sheet Metal and Air Conditioning Contractors' National Association, Inc

Dick Wirz, 2009, *Commercial Refrigeration for Air Conditioning Technicians*, Delmar Publishers Inc, United States of America.

Kadek Amerta Yasa, I Dewa Made Susila, 2011, *Analisis Energy Eficiency Ratio (EER) AC Split ditinjau dari Kapasitas Refrigerasi*, Jurnal Logic. Vol. 11, No. 2, Juli 2011

Prihadi Setyo Darmanto, Windy Hermawan Mitrakusumah, 2008, *Pengujian dan Usulan Labelisasi Kinerja Mesin Pengkondisi Udara Tipe Terpisah (Split System AC)*, Jurnal Teknik Gelagar, Vol 19, No. 01 April 2008 : 69-77

Sungadiyanto, 2006, *Studi Eksperimental Performa Mesin pengkondisian Udara (AC) MC QUAY dengan Refrigeran R-22 Pada Laboratorium Teknik Mesin Universitas Negeri Semarang*, Laporan Tugas Akhir Jurusan Teknik Mesin Universitas Negeri Semarang.



UNIVERSITAS
GADJAH MADA

KAJIAN KONSUMSI ENERGI LISTRIK PADA AIR CONDITIONER MENYONGSONG LABELISASI ENERGI

Nur Winda, Ir. Fauzun, S.T. M.T., Ph.D., IPM., ASEAN.Eng

Universitas Gadjah Mada, 2013 | Diunduh dari <http://etd.repository.ugm.ac.id/>

LAMPIRAN

Lampiran 1

Data hasil pengujian mesin uji CS-C96KJ

Spesifikasi

Model	CS-C96KJ			
phase	1			
volts	220	V		
freq	50	Hz		
cooling capacity	9000	Btu/h	2,64	kW
current	4	A		
power input	840	W	EER	10,71
refrigerant	R22			

Data :

18	Ts	16	°C
	Tr	27	°C
	RHs	70	%
	RHr	54,5	%

coolpack		supply	
tdb	10,54	°C	
twb	12,83	°C	
humidity ratio	0,007916	kg/kg	
specific enthalpy	36,13	kJ/kg	

ρ	1	kg/m ³
A	0,0536	m ²
Vu	2,9	m/s
hr	58,22	kJ/kg

W		
pengujian	782	Watt

EER	4,390882	EER by btu/h	14,98231
-----	----------	-----------------	----------



Kec.udara	2,9	m/s
L evap	0,0536	m2

return

tdb	17,05	°C
twb	20,3	°C
humidity ratio	0,01217	kg/kg
specific enthalpy	58,22	kJ/kg

hs	36,13	kJ/kg
----	-------	-------

COP	4,391065
-----	----------

m	0,15544	
Q	3,43367	kJ/s
	3433,67	watt
	11716,17	btu/h

25

Ts	22	°C
Tr	28	°C
RHs	65,5	%
RHr	50,3	%
Kec.udara	3,5	m/s
L evap	0,0536	m2

coolpack supply

tdp	15,24	°C
twb	17,64	°C
humidity ratio	0,01082	kg/kg
specific enthalpy	49,64	kJ/kg

ρ	1	kg/m3
A	0,0536	m2
Vu	3,5	m/s
hr	58,57	kJ/kg
hs	49,64	kJ/kg

W pengujian	909	Watt
-------------	-----	------

EER	1,842979	EER by btu/h	6,288506
-----	----------	-----------------	----------

COP	1,843056
-----	----------

return

tdp	16,71	°C
twb	20,41	°C
humidity ratio	0,01191	kg/kg
specific enthalpy	58,57	kJ/kg

m	0,1876	
Q	1,675268	kJ/s
	1675,268	watt
	5716,252	btu/h



20

Ts	17	°C
Tr	27	°C
RHs	68,5	%
RHr	55	%
Kec.udara	2,9	m/s
L evap	0,0536	m ²

tdp	11,17	°C
twb	13,56	°C
humidity ratio	0,00826	kg/kg
specific enthalpy	38,02	kJ/kg

tdp	17,2	°C
twb	20,38	°C
humidity ratio	0,01229	kg/kg
specific enthalpy	58,21	kJ/kg

ρ	1	kg/m ³
A	0,0536	m ²
Vu	2,9	m/s
hr	58,21	kJ/kg
hs	38,02	kJ/kg

m	0,15544	
Q	3,138334	kJ/s
	3138,334	watt
	10708,44	btu/h

W pengujian	751	Watt
-------------	-----	------

EER	4,178873	EER by btu/h	14,25891
-----	----------	--------------	----------

COP	4,179047
-----	----------

22

Ts	19	°C
Tr	27	°C
RHs	66,5	%
RHr	52	%
Kec.udara	3	m/s
L evap	0,0536	m ²

tdp	12,63	°C
twb	15,1	°C
humidity ratio	0,009106	kg/kg
specific enthalpy	42,21	kJ/kg

tdp	16,31	°C
twb	19,88	°C

ρ	1	kg/m ³
A	0,0536	m ²
Vu	3	m/s
hr	56,77	kJ/kg
hs	42,21	kJ/kg

m	0,1608	
---	--------	--

W pengujian	650	Watt
-------------	-----	------

EER	3,60192	EER by btu/h	12,29026
-----	---------	--------------	----------

COP	3,60207
-----	---------



humidity ratio	0,0116	kg/kg
specific enthalpy	56,77	kJ/kg

Q	2,341248	kJ/s
	2341,248	watt
	7988,671	btu/h

Lampiran 2

Data hasil pengujian mesin uji CU-PC9GKJ

Spesifikasi

Model	CU-PC9GKJ			
phase	1			
volts	220	V		
freq	50	Hz		
cooling capacity	9000	Btu/h	2,6379	kW
current	4,1	A		
power input	840	W	EER	10,7
refrigerant	R22			

Data :

18	Ts	14	°C
	Tr	31,1	°C
	RHs	74,6	%
	RHr	52,4	%
	Kec.udara	1,9	m/s
	L evap	0,05865	m ²

coolpack	supply	
tdp	9,56	°C
twb	11,5	°C
humidity ratio	0,00741	kg/kg
specific enthalpy	32,81	kJ/kg

return		
tdp	20,39	°C

ρ	1	kg/m ³
A	0,05865	m ²
Vu	1,9	m/s
hr	70,06	kJ/kg
hs	32,81	kJ/kg

m	0,111435	
---	----------	--

W pengujian	1077	Watt
-------------	------	------

EER	3,854182	EER by	13,1510154
		btu/h	

COP	3,854342
-----	----------



twb	23,54	°C
humidity ratio	0,01507	kg/kg
specific enthalpy	70,06	kJ/kg

Q	4,15095375	kJ/s
	4150,95375	
	14163,6436	btu/h

coolpack		supply	
tdp	16,36	°C	
twb	18,63	°C	
humidity ratio	0,01164	kg/kg	
specific enthalpy	52,75	kJ/kg	

ρ	1	kg/m ³
A	0,05865	m ²
Vu	1,6	m/s
hr	70,66	kJ/kg
hs	52,75	kJ/kg

W pengujian	1063	Watt
-------------	------	------

EER	1,581067	EER by	5,39482569
		btu/h	

COP	1,581133
-----	----------

return		
tdp	20,34	°C
twb	23,7	°C
humidity ratio	0,01502	kg/kg
specific enthalpy	70,66	kJ/kg

m	0,09384	
Q	1,6806744	kJ/s
	1680,6744	
	5734,69971	btu/h

W pengujian	1090	Watt
-------------	------	------

EER	2,245057	EER by	7,66045475
		btu/h	

25	Ts	23	°C
	Tr	32	°C
	RHs	66,2	%
	RHr	50,2	%
	Kec.udara	1,6	m/s
	L evap	0,05865	m ²

20	Ts	20	°C
	Tr	31,5	°C
	RHs	71,5	%



RHr	51,2	%
Kec.udara	1,8	m/s
L evap	0,05865	m ²

specific enthalpy	46,62	kJ/kg
-------------------	-------	-------

tdp	20,2	°C
twb	23,48	°C
humidity ratio	0,01489	kg/kg
specific enthalpy	69,8	kJ/kg

hr	69,8	kJ/kg
hs	46,62	kJ/kg

m	0,10557	
Q	2,4471126	kJ/s
	2447,1126	watt
	8349,89568	btu/h

COP	2,245151
-----	----------

22	Ts	22	°C
	Tr	31,8	°C
	RHs	68,7	%
	RHr	50,4	%
	Kec.udara	1,7	m/s
	L evap	0,05865	m ²

tdp	15,99	°C
twb	18,07	°C
humidity ratio	0,01136	kg/kg
specific enthalpy	51,01	kJ/kg

tdp	20,22	°C
twb	23,57	°C
humidity ratio	0,01491	kg/kg
specific enthalpy	70,16	kJ/kg

ρ	1	kg/m ³
A	0,05865	m ²
Vu	1,7	m/s
hr	70,16	kJ/kg
hs	51,01	kJ/kg

m	0,099705	
Q	1,90935075	kJ/s
	1909,35075	watt
	6514,97589	btu/h

W pengujian	1212	Watt
-------------	------	------

EER	1,575372	EER by btu/h	5,37539265
-----	----------	-----------------	------------

COP	1,575437
-----	----------

Lampiran 3

Data hasil pengujian mesin uji AH-AP9FHY

Spesifikasi

Model	AH-AP9FHY			
phase	1			
volts	220	V		
freq	50	Hz		
cooling capacity	2,64	KW	9007,68	Btu/h
current	3,8	A		
power input	820	W	EER	11
refrigerant	R22			

Data :

18	Ts	14	°C
	Tr	31,1	°C
	RHs	74,6	%
	RHr	52,4	%
	Kec.udara	1,9	m/s
	L evap	0,05865	m ²

coolpack	supply	
tdp	9,56	°C
twb	11,5	°C
humidity ratio	0,00741	kg/kg
specific enthalpy	32,81	kJ/kg

ρ	1	kg/m ³
A	0,05865	m ²
Vu	1,9	m/s
hr	70,06	kJ/kg
hs	32,81	kJ/kg

return		
tdp	20,39	°C

m	0,111435	
---	----------	--

W pengujian	895	Watt
-------------	-----	------

EER	4,637937	EER by btu/h	15,8253
-----	----------	-----------------	---------

COP	4,63813
-----	---------

20	Ts	16	°C
	Tr	31,1	°C
	RHs	72,3	%
	RHr	51,9	%
	Kec.udara	1,9	m/s
	L evap	0,05865	m ²

twb	23,54	°C
humidity ratio	0,01507	kg/kg
specific enthalpy	70,06	kJ/kg

Q	4,150954	kJ/s
	4150,954	watt
	14163,64	kJ/kg

tdp	11,02	°C
twb	13,08	°C
humidity ratio	0,008179	kg/kg
specific enthalpy	36,8	kJ/kg

ρ	1	kg/m ³
A	0,05865	m ²
Vu	1,9	m/s
hr	69,04	kJ/kg
hs	36,8	kJ/kg

W pengujian	866	Watt
----------------	-----	------

EER	4,148573	EER by btu/h	14,15552
-----	----------	--------------------	----------

COP	4,148746
-----	----------

tdp	20,06	°C
twb	23,28	°C
humidity ratio	0,01475	kg/kg
specific enthalpy	69,04	kJ/kg

m	0,111435	
Q	3,592664	kJ/s
	3592,664	watt
	12258,68	

W pengujian	843	Watt
----------------	-----	------

EER	3,366079	EER by btu/h	11,48554
-----	----------	--------------------	----------

COP	3,366219
-----	----------

22	Ts	18	°C
	Tr	31,4	°C
	RHs	71,2	%
	RHr	51,6	%
	Kec.udara	1,7	m/s

tdp	12,71	°C
twb	14,78	°C
humidity ratio	0,009158	kg/kg
specific enthalpy	41,32	kJ/kg

ρ	1	kg/m ³
A	0,05865	m ²
Vu	1,7	m/s
hr	69,78	kJ/kg
hs	41,32	kJ/kg

L evap	0,05865	m ²
--------	---------	----------------

tdp	20,24	°C
twb	23,47	°C
humidity ratio	0,01492	kg/kg
specific enthalpy	69,78	kJ/kg

m	0,099705	
Q	2,837604	kJ/s
	2837,604	watt

9682,309

25	Ts	22	°C
	Tr	31,7	°C
	RHs	68,4	%
	RHr	51,3	%
	Kec.udara	1,6	m/s
	L evap	0,05865	m ²

tdp	15,94	°C
twb	18,03	°C
humidity ratio	0,01131	kg/kg
specific enthalpy	50,88	kJ/kg

ρ	1	kg/m ³
A	0,05865	m ²
Vu	1,6	m/s
hr	70,53	kJ/kg
hs	50,88	kJ/kg

W pengujian	767	Watt
-------------	-----	------

EER	2,404115	EER by btu/h	8,203181
-----	----------	--------------	----------

COP	2,404215
-----	----------

tdp	20,42	°C
twb	23,66	°C
humidity ratio	0,0151	kg/kg
specific enthalpy	70,53	kJ/kg

m	0,09384	
Q	1,843956	kJ/s
	1843,956	watt

6291,84