LAMPIRAN

Lampiran 1. Data temperatur PATS *charging* 24 November 2016

						T PCM di kapsul						T air di dalam tangki							Temperatur permukaan tangki				
Waktu	Data ke-	T HTF dr kolektor	T HTF ke kolektor	T air dingin ke tangki	T air panas dr tangki	K3		K14		K24		Vert. atas	Vert. atas-tengah	Hor. Kanan	Vert. tengah	Hor. Kiri	Vert. bawah-tengah	Vert. bawah	Bawah	Tengah	Atas	Kanan	Kiri
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22
8:27	1	35,19204	28,50937	29,51229	30,93798	30,33938	30,48139	29,6202	29,51365	28,51959	28,59593	33,58612	30,20949	29,2753	29,385	29,31127	29,24157	28,38757	29,00246	29,9347	34,51547	30,74819	30,00639
8:32	6	33,56446	28,70499	30,03206	31,77398	31,07447	31,10658	29,9961	29,88836	28,72035	28,79603	33,5351	30,83929	29,58387	29,585	29,51193	29,54916	28,65202	29,19422	30,23483	33,81307	30,80996	30,19801
8:37	11	41,09135	29,1015	30,57328	32,28998	31,68713	31,71724	30,32165	30,21287	28,9872	29,13373	33,76521	31,4988	29,95845	29,95837	29,92249	30,20925	28,95867	29,57146	30,64896	35,9356	31,50759	30,57126
8:42	16	48,59508	29,29635	31,41533	34,30428	32,67212	32,55591	30,66074	30,65838	29,19344	29,30341	41,2687	32,67029	30,23644	30,2713	30,23644	30,41464	29,03864	29,72284	30,94447	42,71453	32,38117	30,83373
8:47	21	50,38906	29,53648	31,97911	38,61676	35,1358	34,83316	31,04515	31,00574	29,42706	29,57212	44,99349	35,79718	30,68557	30,6473	30,57773	30,61147	29,28506	29,96835	31,47798	45,97533	33,6676	31,25812
8:52	26	50,52189	29,09741	31,89853	40,48027	37,70483	37,07335	31,03639	31,10444	29,12151	29,19588	46,11487	38,24094	30,59597	30,52217	30,34434	30,19967	28,8651	29,37066	31,27422	47,12144	34,39656	30,91173
8:57	31	43,07551	29,16639	31,78803	41,56242	39,84689	39,45863	31,357	31,4956	29,34334	29,3094	44,83941	39,88551	30,99726	30,81471	30,45815	29,77549	28,98804	29,49316	31,8639	44,93746	35,55827	31,46384
9:02	36	43,2311	29,46688	32,12486	41,2442	40,39617	40,29104	32,05303	32,11774	29,7316	29,69641	43,15765	40,16297	31,78019	31,52359	31,34915	30,2699	29,31377	29,78188	32,65568	43,34155	36,49128	32,07431
9:07	41	46,32021	29,50415	32,09036	40,97782	40,5047	40,506	32,4494	32,47702	30,02312	29,95115	43,41093	40,59386	32,46623	32,20752	31,85583	30,45287	29,51993	29,91562	33,39959	44,6026	37,36858	32,70095
9:12	46	50,73345	29,81391	32,68775	41,53965	41,45564	41,41826	33,4413	33,53719	30,17314	30,13652	45,34042	41,31158	33,26195	32,89349	32,54421	30,81731	29,43272	29,90041	33,99411	46,3691	38,00512	33,12283
9:17	51	47,80934	29,36137	32,19874	42,40067	42,25397	42,214	33,67008	33,87246	29,86451	29,79305	47,24072	42,10876	33,4563	32,97994	32,63097	30,43815	28,93679	29,22695	33,96602	47,65269	38,37046	33,13058
9:22	56	40,55974	29,31878	31,58148	42,51172	42,63955	42,77603	34,16542	34,33038	30,06139	30,02514	44,80255	42,3034	33,83202	33,46184	33,00691	30,491	29,0852	29,33899	34,50829	45,35262	38,83966	33,63563
9:27	61	38,87407	29,48585	31,17406	41,45342	42,09244	42,23076	34,61927	34,85416	30,5981	30,52429	43,26813	41,83869	34,4749	33,99557	33,50665	30,88253	29,38148	29,59841	35,01851	43,94117	39,02678	34,10876
9:32	66	39,1745	30,25413	31,4052	41,11777	42,03656	42,21062	35,74559	35,97664	31,23058	31,15474	42,39821	41,61109	35,2132	34,83889	34,2813	31,65605	29,97724	30,29964	35,86271	43,17976	39,54722	35,02216
9:37	71	39,28171	30,4695	31,33372	40,5777	41,64449	41,78432	36,21152	36,44098	31,49849	31,52922	41,62975	41,09382	35,73115	35,17671	34,69205	31,85142	30,1506	30,40075	36,17863	42,28497	39,39792	35,33723
9:42	76	41,86555	30,31207	30,96027	39,92334	40,80959	40,98779	36,12582	36,31988	31,7137	31,70792	40,87998	40,49602	35,91738	35,39812	34,98592	32,00175	30,3166	30,45869	36,34395	41,52464	39,2413	35,53781
9:47	81	45,50028	31,07662	31,47555	39,89532	41,25011	41,46239	36,96142	37,15266	32,2212	32,21377	42,06227	40,92034	36,59499	36,14513	35,69977	32,64316	30,86343	31,00368	36,96011	43,62919	39,74913	36,18799
9:52	86	45,78702	31,3661	31,65813	40,49074	41,36014	41,53649	37,2507	37,40528	32,71772	32,67292	43,48244	41,34126	37,01848	36,5317	36,0877	33,13793	31,24885	31,2804	37,37974	44,4717	40,02513	36,53511
9:57	91	44,33438	31,619	31,73222	40,99485	41,86192	42,03656	37,68228	37,79976	32,81681	32,77169	43,18879	41,5106	37,18886	36,70158	36,3656	33,80876	31,43448	31,39381	37,52883	44,12259	40,10253	36,79083
10:02	96	43,74999	31,88897	31,71576	40,8534	42,02393	42,23358	37,91626	37,96167	33,03103	33,12828	42,58161	41,61619	37,36667	36,91453	36,50771	33,5574	31,3635	31,39467	37,5297	43,44866	40,13911	36,86304
10:07	101	47,08671	32,64243	32,11274	41,61355	42,45386	42,66206	38,49038	38,53389	33,92634	34,05636	43,22182	42,53907	38,1521	37,8046	37,43671	34,34228	32,4541	32,37436	38,50854	44,81103	40,9378	37,80347
10:12	106	49,51033	33,33773	32,70289	42,43605	43,11128	43,17513	39,18522	39,15522	34,57017	34,73378	45,92689	43,10613	38,86562	38,51596	38,07904	35,05528	33,17669	33,09463	39,29966	47,19188	41,69201	38,52111
10:17	111	52,11006	34,25026	33,43943	44,39559	44,34153	44,40129	39,99002	39,95739	35,39445	35,48387	47,5629	44,4912	39,65183	39,26417	38,86566	35,94801	33,97168	33,95858	40,19858	48,89778	42,69649	39,34632
10:22	116	54,28812	34,23915	33,35653	45,61803	45,22069	45,17109	39,97892	39,94634	35,41426	35,4679	50,92044	45,43351	39,60012	39,21261	38,84967	35,82495	33,98773	33,7601	40,10742	51,99054	42,96203	39,11293
10:27	121	55,36272	35,00608	33,87541	47,67733	47,26506	47,27971	40,92393	40,92386	36,14217	36,26479	50,89641	47,43043	40,46886	40,07873	39,6831	38,40464	34,60047	34,3352	40,89617	52,06438	43,89185	39,65037
10:32	126	57,44056	36,32579	35,05709	49,73748	49,60854	49,50932	42,42114	42,52281	37,3511	37,43403	54,609	49,68854	41,95978	41,52959	41,1034	37,32705	36,00457	35,77068	42,65108	55,56524	45,99925	41,00964
10:37	131	57,64199	36,13735	34,79619	50,02276	49,91808	50,03013	42,44681	42,40621	37,64191	37,61691	53,69303	50,68352	42,28538	41,7831	41,25074	38,2586	36,07845	35,59441	42,90292	54,54469	46,5707	41,04747
10:42	136	61,25938	37,05907	35,68594	51,7034	51,11851	51,33257	43,83102	43,92798	38,54587	38,37539	57,59388	52,21314	43,57867	43,03704	42,50923	39,15925	36,74197	36,14892	44,06231	58,26373	48,04727	42,20445
10:47	141	62,4011	37,14826	35,70386	52,54006	51,49091	51,77437	44,45443	44,51382	38,48214	38,20492	57,99018	53,35095	43,83584	43,2224	42,51697	39,35123	36,44414	35,81625	44,30029	58,63969	48,49784	42,29974
10:52	146	60,25212	37,49937	35,55502	55,16992	52,3717	52,54616	45,44584	45,50195	39,80607	39,45356	58,83937	55,43425	45,58236	44,8929	44,22933	39,56039	37,92965	37,15487	46,16966	59,6429	50,57524	44,3074
10:57	151	55,72665	38,05065	35,71486	55,2663	53,52183	53,6571	46,45859	46,54679	40,63374	40,06512	57,60937	55,12305	46,26467	45,57328	44,84103	40,10072	38,34924	37,53764	46,87156	58,26116	51,31069	45,2207
11:02	156	57,38197	39,11887	35,85731	53,92767	54,19382	54,29152	47,56009	47,60919	41,33115	40,86725	56,10841	54,75404	47,13739	46,44351	45,7501	40,974	38,81597	38,07439	47,62013	56,81917	51,52541	46,07401
11:07	161	54,89998	39,49569	35,5557	53,3291	54,28514	54,4884	48,39806	48,37356	42,0299	41,56395	55,24478	54,49245	47,85985	47,16392	46,50875	41,8036	39,28212	38,46799	48,08369	55,93965	51,77515	46,82007
11:12	166	54,8825	39,26435	34,53454	52,29015	53,20521	53,41214	47,95405	47,86016	42,44544	41,80046	53,85197	53,63316	47,89224	47,23165	46,6479	41,80046	39,69594	38,70252	48,17542	54,58485	51,37025	46,94703
11:17	171	52,77929	40,38265	34,7284	51,96214	53,71553	53,95601	48,99882	49,07854	43,29306	42,82334	53,52526	53,44871	48,63038	48,00311	47,38661	42,89442	40,43584	39,4761	48,62719	54,11613	51,53748	47,5748
11:22	176	51,74694	40,55268	34,11095	51,08147	53,07007	53,34807	48,91987	48,99986	43,65992	43,22464	52,72087	54,12969	48,71188	48,15519	47,5748	43,29569	40,76014	39,72832	48,55909	53,27192	51,07938	47,6486
11:27	181	51,7264	40,7811	33,55215	49,74516	52,58885	52,83321	48,93474	48,9793	43,2441	42,95221	51,10187	51,52807	48,15525	47,63563	47,19556	44,12436	40,51793	39,6292	48,06934	52,11404	50,37751	47,33739
11:32	186	52,77218	41,79853	33,71724	50,45714	52,96453	53,10168	49,63081	49,67306	44,44865	44,15303	51,41423	52,01599	49,03651	48,54969	48,14841	44,54355	41,84302	40,91515	48,962	52,47181	50,98515	48,29835
11:37	191	53,57157	42,56789	33,84782	50,56041	52,91639	53,01838	49,90205	49,90802	45,1309	44,86866	51,98719	52,26895	49,36177	48,94478	48,58043	45,22352	42,6605	41,80155	49,42082	53,35183	51,30153	48,82663
11:42	196	53,15825	43,00472	33,60723	50,34698	52,53695	52,78149	49,84144	49,81222	45,54273	45,42115	51,93649	52,21843	49,41751	49,07116	48,74277	45,70494	43,0871	42,19144	49,38409	53,06816	51,12299	48,89622
11:47	201	53,59813	43,44738	33,33675	50,17559	52,4115	52,62116	49,82227	49,8285	45,81358	45,7266	51,70997	52,09867	49,43919	49,05737	48,79997	46,18765	43,48465	42,58792	49,31854	53,0736	51,02203	48,97247

Waktu	Data ke-	T HTF dr kolektor	T HTF ke kolektor	T air dingin ke tangki	T air panas dr tangki	T PCM di kapsul						T air di dalam tangki							Temperatur permukaan tangki				
						K3		K14		K24		Vert. atas	Vert. atas-tengah	Hor. Kanan	Vert. tengah	Hor. Kiri	Vert. bawah-tengah	Vert. bawah	Bawah	Tengah	Atas	Kanan	Kiri
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22
11:52	206	53,45656	43,58911	32,79813	49,93422	51,70216	51,84357	49,14732	49,01418	45,97547	45,67514	51,65852	51,65873	49,06811	48,72281	48,39321	46,27805	43,80981	42,80559	49,18093	53,07801	50,67172	48,79989
11:57	211	55,29331	44,72738	33,33849	50,6981	52,3069	52,41094	49,7885	49,68868	46,80383	46,64275	52,48401	52,41083	49,78839	49,47627	49,18481	47,52876	44,79465	43,96541	49,94953	54,05401	51,40415	49,56614
12:02	216	56,48393	45,57105	33,79678	51,33065	52,65337	52,82688	50,31293	50,17606	47,24222	47,07975	53,70017	52,66971	50,02078	49,74333	49,45279	47,22924	45,46719	44,6006	50,2651	55,10855	51,75489	49,91613
12:07	221	59,28382	45,51858	33,45678	51,37693	52,2111	52,42144	49,79905	49,66382	47,23736	47,07491	54,26186	52,70018	49,8662	49,58922	49,36918	47,25209	45,50452	44,67333	50,05388	56,03617	51,55311	49,71479
12:12	226	62,05442	45,97313	33,66537	53,19381	52,4172	52,62683	49,86347	49,69265	47,53555	47,33671	58,13001	53,52601	50,05743	49,81523	49,45395	50,48733	45,88498	45,08821	50,25584	59,15036	51,99381	49,87151
12:17	231	59,64118	46,71575	34,30886	55,66953	55,28351	55,06017	50,50029	50,36282	48,07596	47,94624	59,19658	55,75573	50,56151	50,28237	50,0647	48,37125	46,46026	45,76831	50,7586	59,82469	53,06298	50,44349
12:22	236	61,31802	47,60511	34,99334	56,24124	56,20654	56,2972	51,14194	50,93171	48,66001	48,52843	57,79949	56,44088	51,14468	50,86371	50,64805	48,91788	47,3215	46,5562	51,54666	58,70655	53,84995	51,08769
12:27	241	61,90081	48,01559	35,73094	56,56853	56,93438	56,84677	51,62409	51,41234	49,04931	48,98728	60,09295	57,42594	51,63976	51,39261	51,10781	48,70407	47,8476	47,22259	52,195	61,07302	54,70976	51,6634
12:32	246	57,5294	47,72208	35,36247	56,38647	57,03032	56,90716	51,33027	51,15479	48,86418	48,73195	58,4264	56,9253	51,34855	51,13765	50,88744	48,90896	47,61018	46,84407	51,65732	58,88676	54,31451	51,23337
12:37	251	63,14762	48,17516	35,4983	56,02328	56,95225	57,00549	51,3938	51,28881	49,178	49,00936	57,67882	57,09568	51,8037	51,55604	51,23634	49,15096	48,06138	47,40031	52,28465	59,7204	54,79927	51,71743
12:42	256	60,25767	47,98889	35,05906	56,26457	57,01379	57,03158	51,20728	51,0322	49,00438	48,83631	59,23663	57,17005	51,59493	51,2772	51,13388	48,62388	48,08709	47,21333	52,13304	60,10184	54,65223	51,53526
12:47	261	63,60167	48,63324	35,92584	57,57054	58,04537	58,16538	52,02974	51,88737	49,64563	49,65245	59,59167	58,22856	52,51869	52,30411	52,02247	49,65245	48,80446	48,07042	53,13209	61,15893	55,75157	52,49173
12:52	266	65,16321	49,28863	36,37396	58,31419	58,73454	58,78184	52,2252	52,08221	50,08612	49,94998	61,79286	58,9469	52,63952	52,63648	52,32056	49,73769	48,8798	48,25178	53,41976	62,77908	56,21561	52,74326
12:57	271	65,7277	49,85839	37,12928	59,8606	60,07936	60,15736	52,86669	52,72164	50,43601	50,40485	62,70411	60,24344	53,55563	53,23184	52,88256	50,228	49,51721	48,88735	54,19704	63,76018	57,16832	53,51829
13:02	276	63,13764	49,58114	36,92041	59,87445	60,54377	60,72567	52,97879	52,90402	50,25493	50,33047	62,24244	61,01324	53,51657	53,26352	52,98521	49,94136	49,49567	48,68886	54,17557	62,96668	57,39426	53,49688
13:07	281	63,41774	50,18187	37,27755	60,02828	60,96627	61,07644	53,54486	53,36232	50,70897	50,67692	61,24828	60,79517	54,07595	53,82113	53,4385	50,64157	49,93495	49,26849	54,75517	61,99652	57,97279	54,00423
13:12	286	62,6721	49,60732	36,62476	58,02028	60,32294	60,54075	53,32384	53,17732	49,81219	49,95996	60,92139	59,90666	53,57061	53,24678	52,89755	50,03072	48,97395	48,23942	53,90319	61,81853	57,22845	53,11939
13:17	291	65,10901	51,42684	38,46538	60,43047	62,34844	62,55931	55,99427	55,76869	51,40179	51,68558	62,04257	62,18424	55,7934	55,49795	55,12124	52,32158	50,62473	50,06242	56,15037	63,1005	59,25945	55,21913
13:22	296	64,75929	50,68538	38,14454	60,43231	61,36248	61,54159	55,25238	54,74697	51,18135	51,35985	62,95106	61,43891	55,60891	55,31403	55,00745	51,92531	50,7685	50,17038	56,29365	64,15519	59,54368	55,50307
13:27	301	60,11802	49,97222	36,56438	59,80721	60,43983	60,69239	54,53885	54,67068	51,0219	50,91811	61,24198	61,28093	54,88375	54,80279	54,45904	51,27165	50,45713	49,68302	55,73574	62,16211	58,95151	54,98201
13:32	306	61,03337	50,92847	36,95948	59,12741	60,86442	61,22095	55,77862	55,76525	51,39961	51,40065	60,59484	60,95231	55,29597	55,28419	54,87135	51,43599	50,76493	49,98996	56,04257	61,27238	58,97535	55,2527
13:37	311	57,14256	50,20062	35,47056	58,22843	59,46796	59,75905	55,05047	55,11005	51,39524	51,36095	59,53201	59,89323	55,327	54,99772	54,51306	51,50234	50,60374	49,79384	55,70503	60,23385	58,39119	55,02193
13:42	316	56,77258	51,06693	35,70332	57,86749	59,69727	59,88205	56,09395	56,15004	51,83029	51,86525	59,40035	59,55097	55,93787	55,50093	55,05346	52,11259	50,94957	50,24481	56,01443	59,94366	58,24101	55,36569
13:47	321	55,42927	50,46182	34,1941	56,52453	58,28114	58,54114	55,63017	55,51152	51,48541	51,41547	57,99758	58,36418	55,45232	54,87577	54,42609	51,38013	50,62582	49,78048	55,37329	58,67272	57,24733	54,79697
13:52	326	54,37297	50,88802	34,12426	56,46392	58,38892	58,64856	56,51613	56,25364	51,76335	51,72785	57,77992	59,02717	55,94181	55,29329	54,84509	52,01053	51,06146	50,25029	55,66622	58,5066	57,22191	55,15955
13:57	331	54,00569	51,01498	33,78685	55,85327	57,98597	58,17658	56,46632	56,09826	51,83409	51,90437	57,13852	57,57857	55,75962	55,18216	54,76897	51,96985	51,04991	50,38024	55,54858	58,0023	56,85696	55,14809
14:02	336	54,80125	51,21115	33,84238	55,39994	57,97002	58,19589	56,87458	56,57574	51,89446	51,99988	56,7444	57,29152	55,82504	55,28265	54,94058	52,24719	51,1259	50,45602	55,44748	57,47912	56,50848	55,11783
14:07	341	56,7385	51,73965	34,23515	55,36292	58,14497	58,40544	57,40305	57,06733	52,29526	52,29336	56,61384	57,47842	55,90664	55,39926	55,09298	52,46998	51,37238	50,70178	55,55184	57,26603	56,5067	55,22186
14:12	346	55,95503	51,37803	33,61719	55,03704	57,11214	57,41141	56,36979	56,00203	52,3951	52,42819	56,14772	56,94361	55,65257	55,21648	54,90958	52,46353	51,57663	50,94079	55,50794	57,0462	56,42749	55,28391
14:17	351	54,6703	51,22132	32,91995	54,27851	56,38982	56,62113	55,57641	55,14056	52,22541	52,22373	55,48321	56,10538	55,23554	54,80074	54,49238	53,38918	51,31058	50,60479	54,92407	56,3238	55,70242	54,73715
14:22	356	53,56436	51,13858	32,6206	53,96688	56,16562	56,36245	55,45824	55,058	52,19032	52,25941	55,37742	55,99998	55,05898	54,55414	54,35112	52,64798	51,28112	50,57542	54,68233	56,01255	55,35466	54,53145
14:27	361	53,70309	51,59563	32,94112	54,43323	56,19851	56,39524	55,59727	55,09082	52,66066	52,65755	55,42239	56,04479	55,21011	54,77538	54,53771	52,44563	51,82067	51,18414	55,07925	56,23165	55,60994	54,92711
14:32	366	53,12443	51,29902	32,38866	53,73383	55,76027	55,92324	55,22963	54,75957	52,4296	52,42725	54,80245	55,5329	54,76706	54,36896	54,23611	52,46257	51,50796	50,94305	54,51939	55,70927	55,05026	54,51017
14:37	371	52,24965	51,05974	31,93019	53,31083	55,09628	55,33201	54,67161	54,13266	52,27319	52,27136	54,25689	55,02465	54,3631	54,03681	53,86743	52,58928	51,33126	50,7315	54,166	55,21624	54,62619	54,15793
14:42	376	51,53154	51,40182	31,99041	53,21108	55,15561	55,32063	54,58939	54,12125	52,56963	52,46087	54,376	55,10803	54,26979	53,97908	53,80951	52,5315	51,62116	50,98519	54,13678	55,2224	54,59698	54,16411

Lampiran 2. Olah data Temperatur dan radiasi matahari tanggal 24 November 2016

Waktu		T rata PCM	T rata air	K3 rata	K14 rata	K24 rata	Waktu		Solar Radiation , W/m²	Temp. udara luar, °C	Energi radiasi, MJ/m²	Akumulasi energi radiasi, MJ/m²
							8:26	0	220,6	27,924	0	0
8:27	1	29,51169	29,91376	30,41039	29,56692	28,55776	8:27	1	303,1	27,998	0,013236	0,013236
8:32	6	29,93031	30,17948	31,09053	29,94223	28,75819	8:32	6	566,9	28,122	0,034986	0,131244
8:37	11	30,3433	30,61018	31,70219	30,26726	29,06047	8:37	11	714,4	28,345	0,043464	0,325458
8:42	16	30,84067	32,01949	32,61401	30,65956	29,24842	8:42	16	703,1	29,515	0,043086	0,5433
8:47	21	31,8365	33,22826	34,98448	31,02545	29,49959	8:47	21	555,6	29,79	0,042864	0,747036
8:52	26	32,5394	33,55472	37,38909	31,07041	29,1587	8:52	26	220,6	29,59	0,019314	0,936372
8:57	31	33,46848	33,67979	39,65276	31,4263	29,32637	8:57	31	225,6	28,965	0,012564	0,997764
9:02	36	34,04767	33,93674	40,3436	32,08539	29,71401	9:02	36	299,4	28,891	0,014664	1,079778
9:07	41	34,31857	34,35817	40,50535	32,46321	29,98714	9:07	41	306,9	28,742	0,016536	1,199442
9:12	46	35,02701	35,08595	41,43695	33,48925	30,15483	9:12	46	896,9	29,49	0,038364	1,356762
9:17	51	35,27801	35,3988	42,23398	33,77127	29,82878	9:17	51	191,9	28,766	0,013464	1,515276
9:22	56	35,66632	35,28327	42,70779	34,2479	30,04326	9:22	56	160,6	28,097	0,009636	1,56489
9:27	61	35,81984	35,33542	42,1616	34,73671	30,56119	9:27	61	163,1	28,023	0,009786	1,613754
9:32	66	36,39246	35,71085	42,12359	35,86112	31,19266	9:32	66	155,6	27,998	0,009114	1,660662
9:37	71	36,51817	35,76079	41,7144	36,32625	31,51385	9:37	71	243,1	28,221	0,014586	1,717548
9:42	76	36,27745	35,71368	40,89869	36,22285	31,71081	9:42	76	439,4	28,444	0,019764	1,80264
9:47	81	36,87692	36,41844	41,35625	37,05704	32,21748	9:47	81	335,6	28,444	0,022164	1,920282
9:52	86	37,15721	36,97834	41,44831	37,32799	32,69532	9:52	86	276,9	28,791	0,026214	2,031918
9:57	91	37,49484	37,17124	41,94924	37,74102	32,79425	9:57	91	258,1	28,841	0,015036	2,11326
10:02	96	37,71579	37,12966	42,12876	37,93896	33,07966	10:02	96	259,4	29,065	0,015564	2,196696
10:07	101	38,35381	37,99295	42,55796	38,51214	33,99135	10:07	101	404,4	29,015	0,026064	2,312832
10:12	106	38,98847	38,9608	43,14321	39,17022	34,65198	10:12	106	553,1	29,54	0,033564	2,447346
10:17	111	39,92809	39,96506	44,37141	39,97371	35,43916	10:17	111	729,4	30,091	0,025536	2,589504
10:22	116	40,19986	40,547	45,19589	39,96263	35,44108	10:22	116	453,1	30,041	0,029436	2,792718
10:27	121	41,46659	41,65181	47,27239	40,9239	36,20348	10:27	121	771,9	30,142	0,041364	2,975004
10:32	126	43,14116	43,17456	49,55893	42,47197	37,39257	10:32	126	644,4	31,026	0,034314	3,190218
10:37	131	43,34334	43,43326	49,9741	42,42651	37,62941	10:37	131	1016,9	31,357	0,042264	3,38016
10:42	136	44,52189	44,97617	51,22554	43,8795	38,46063	10:42	136	1015,6	31,433	0,050286	3,652446
10:47	141	44,8201	45,24453	51,63264	44,48412	38,34353	10:47	141	1059,4	31,714	0,053214	3,929682
10:52	146	45,85421	46,63832	52,45893	45,4739	39,62981	10:52	146	908,1	31,077	0,050586	4,147446
10:57	151	46,81386	46,83734	53,58947	46,50269	40,34943	10:57	151	386,9	31,052	0,022764	4,305282
11:02	156	47,64217	47,14049	54,24267	47,58464	41,0992	11:02	156	718,1	30,722	0,039336	4,470546
11:07	161	48,18983	47,47935	54,38677	48,38581	41,79693	11:07	161	474,4	30,394	0,024864	4,62156
11:12	166	47,77958	47,25047	53,30867	47,90711	42,12295	11:12	166	401,9	30,621	0,033864	4,775046
11:17	171	48,64422	47,76062	53,83577	49,03868	43,0582	11:17	171	370,6	30,142	0,022386	4,88781
11:22	176	48,53707	47,90689	53,20907	48,95987	43,44228	11:22	176	371,9	30,142	0,025236	5,002368
11:27	181	48,2554	47,17981	52,71103	48,95702	43,09815	11:27	181	376,9	29,916	0,022464	5,113788
11:32	186	48,99529	47,93592	53,03311	49,65193	44,30084	11:32	186	434,4	29,69	0,024486	5,231574
11:37	191	49,29073	48,43245	52,96739	49,90503	44,99978	11:37	191	379,4	29,84	0,023364	5,355216
11:42	196	49,32266	48,59692	52,65922	49,82683	45,48194	11:42	196	379,4	29,941	0,022764	5,467758
11:47	201	49,3706	48,6825	52,51633	49,82538	45,77009	11:47	201	421,9	29,69	0,024414	5,58465
11:52	206	48,89297	48,51275	51,77286	49,08075	45,8253	11:52	206	386,9	29,815	0,022986	5,701686
11:57	211	49,60693	49,3811	52,35892	49,73859	46,72329	11:57	211	469,4	29,79	0,027114	5,82435
12:02	216	50,04854	49,75474	52,74012	50,2445	47,16099	12:02	216	418,1	30,192	0,025236	5,955486
12:07	221	49,73461	49,79189	52,31627	49,73143	47,15614	12:07	221	544,4	30,419	0,050364	6,117744
12:12	226	49,91207	51,05071	52,52202	49,77806	47,43613	12:12	226	636,9	30,495	0,038436	6,309852
12:17	231	51,20483	51,52749	55,17184	50,43155	48,0111	12:17	231	615,6	30,976	0,042486	6,514266
12:22	236	51,96097	51,8766	56,25187	51,03682	48,59422	12:22	236	491,9	30,596	0,022236	6,638802
12:27	241	52,47569	52,60153	56,89057	51,51821	49,0183	12:27	241	714,4	31,689	0,036864	6,817038
12:32	246	52,33644	52,17778	56,96874	51,24253	48,79806	12:32	246	329,4	31,484	0,019986	6,963396
12:37	251	52,47129	52,36899	56,97887	51,3413	49,09368	12:37	251	700,6	30,925	0,024336	7,061238

Lampiran 3. Olah data tanggal 24 November 2016

Massa air	T awal	T akhir	T rata	Δ T	cp	Q sensibel air
(kg)	(°C)	(°C)	(°C)	(°C)	(kJ/kg.°C)	(kJ)
1	2	3	4	5	6	7
47,8392	29,91	54,17	57,00	24,26	4,1833	4854,4598

Massa paraffin	T awal	T akhir	cp,parafin padat	cp,parafin cair	Titik lebur	L	Q sens par. padat	Q sens par. cair	Q laten
(kg)	(°C)	(°C)	(kJ/kg.°C)	(kJ/kg.°C)	(°C)	(kJ/kg)	(kJ)	(kJ)	(kJ)
8	9	10	11	12	13	14	15	16	17
7,76	29,51	54,69	2	2	52	173	349,04	41,75	1342,56

Massa tembaga	cp tembaga	T awal	T akhir	Q sens tembaga	Q total
(kg)	(kJ/kg.°C)	(°C)	(°C)	(kJ)	(kJ)
18	19	20	21	22	23
11,45	0,38	29,71	54,43	107,75	6695,5577

Lampiran 4. Olah data tanggal 24 November 2016

Waktu		Massa air	Air sirkulasi					Air dalam TES					Perolehan kalor (Q collected)	
			Temp. masuk TES	Temp. keluar TES	Selisih temp.	Temp. rata2	Kalor jenis	Temp. awal	Temp. akhir	Selisih temp.	Temp. rata2	Kalor jenis	Sesaat	Kumulatif
Jam	Menit	(kg)	T1 (°C)	T2 (°C)	(°C)	(°C)	(kJ/kg.C)	(°C)	(°C)	(°C)	(°C)	(kJ/kg.C)	(kJ)	(kJ)
1	2	3	4	5	6 = 4-5	7 = (4+5)/2	8	9	10	11 = 10-9	12 = (9+10)/2	13	14 = 3x13x11	15
8:27	1	47,8392	35,1920	28,5094	6,6827	31,8507	4,1788	29,9138	29,9138	0,0000	29,9138	4,1790	0,0000	0
8:28	2	47,8392	34,4612	28,2776	6,1836	31,3694	4,1788	29,9138	30,0088	0,0950	29,9613	4,1790	18,9948	18,9948
8:33	7	47,8392	33,2745	28,8446	4,4299	31,0595	4,1789	30,0088	30,2678	0,2591	30,1383	4,1790	51,7946	70,7894
8:38	12	47,8392	43,4859	29,0786	14,4073	36,2823	4,1786	30,2678	30,8202	0,5523	30,5440	4,1789	110,4158	181,2052
8:43	17	47,8392	49,2179	29,3535	19,8644	39,2857	4,1788	30,8202	32,3106	1,4904	31,5654	4,1788	297,9521	479,1573
8:48	22	47,8392	49,9274	29,4988	20,4286	39,7131	4,1788	32,3106	33,2715	0,9609	32,7911	4,1787	192,0965	671,2538
8:53	27	47,8392	48,9116	29,0431	19,8684	38,9773	4,1787	33,2715	33,7017	0,4302	33,4866	4,1786	85,9965	757,2503
8:58	32	47,8392	42,4666	29,3050	13,1616	35,8858	4,1786	33,7017	33,8196	0,1179	33,7607	4,1786	23,5647	780,8151
9:03	37	47,8392	44,1366	29,7356	14,4010	36,9361	4,1786	33,8196	34,1463	0,3267	33,9829	4,1786	65,3060	846,1210
9:08	42	47,8392	47,5740	30,2345	17,3395	38,9043	4,1787	34,1463	34,8953	0,7490	34,5208	4,1786	149,7312	995,8522
9:13	47	47,8392	52,1108	29,4543	22,6565	40,7825	4,1789	34,8953	34,9105	0,0152	34,9029	4,1786	3,0323	998,8845
9:18	52	47,8392	45,6485	29,1835	16,4650	37,4160	4,1786	34,9105	35,4153	0,5048	35,1629	4,1786	100,9046	1099,7892
9:23	57	47,8392	39,7111	29,0735	10,6376	34,3923	4,1786	35,4153	35,0758	-0,3395	35,2455	4,1786	-67,8632	1031,9259
9:28	62	47,8392	38,7801	29,7498	9,0303	34,2649	4,1786	35,0758	35,4014	0,3256	35,2386	4,1786	65,0958	1097,0217
9:33	67	47,8392	38,9452	30,1668	8,7784	34,5560	4,1786	35,4014	35,6758	0,2744	35,5386	4,1786	54,8551	1151,8768
9:38	72	47,8392	39,4557	30,2146	9,2411	34,8352	4,1786	35,6758	35,6512	-0,0246	35,6635	4,1786	-4,9169	1146,9600
9:43	77	47,8392	42,7805	30,5893	12,1911	36,6849	4,1786	35,6512	35,9071	0,2558	35,7791	4,1786	51,1398	1198,0998
9:48	82	47,8392	45,7113	31,2538	14,4574	38,4826	4,1787	35,9071	36,6149	0,7079	36,2610	4,1786	141,5075	1339,6073
9:53	87	47,8392	45,2749	31,1356	14,1393	38,2052	4,1787	36,6149	36,7909	0,1760	36,7029	4,1786	35,1758	1374,7831
9:58	92	47,8392	44,3400	31,9110	12,4290	38,1255	4,1787	36,7909	37,4843	0,6934	37,1376	4,1786	138,6042	1513,3872
10:03	97	47,8392	43,7111	31,9930	11,7181	37,8521	4,1787	37,4843	37,1677	-0,3165	37,3260	4,1786	-63,2761	1450,1111
10:08	102	47,8392	48,1738	33,1677	15,0061	40,6708	4,1789	37,1677	38,4462	1,2785	37,8070	4,1786	255,5666	1705,6778
10:13	107	47,8392	49,7069	33,4291	16,2778	41,5680	4,1790	38,4462	39,1844	0,7382	38,8153	4,1787	147,5790	1853,2568
10:18	112	47,8392	54,3610	34,7060	19,6550	44,5335	4,1795	39,1844	40,3522	1,1678	39,7683	4,1788	233,4470	2086,7038
10:23	117	47,8392	52,8702	34,0187	18,8515	43,4445	4,1793	40,3522	40,4466	0,0944	40,3994	4,1789	18,8677	2105,5715
10:28	122	47,8392	56,5823	35,1704	21,4119	45,8764	4,1798	40,4466	41,9034	1,4569	41,1750	4,1790	291,2514	2396,8229
10:33	127	47,8392	56,8273	36,4182	20,4091	46,6227	4,1800	41,9034	43,4307	1,5272	42,6670	4,1792	305,3402	2702,1631
10:38	132	47,8392	59,8983	36,5697	23,3286	48,2340	4,1804	43,4307	43,7464	0,3157	43,5885	4,1793	63,1175	2765,2806
10:43	137	47,8392	61,5591	37,2920	24,2671	49,4256	4,1807	43,7464	45,8874	2,1411	44,8169	4,1796	428,0966	3193,3772
10:48	142	47,8392	62,5211	37,3415	25,1796	49,9313	4,1808	45,8874	45,7517	-0,1357	45,8196	4,1798	-27,1340	3166,2433
10:53	147	47,8392	61,1602	38,1708	22,9894	49,6655	4,1808	45,7517	46,9683	1,2166	46,3600	4,1799	243,2772	3409,5205
10:58	152	47,8392	54,6586	38,0048	16,6538	46,3317	4,1799	46,9683	46,9238	-0,0445	46,9460	4,1800	-8,9064	3400,6141
11:03	157	47,8392	57,6764	39,0604	18,6159	48,3684	4,1804	46,9238	47,1122	0,1885	47,0180	4,1801	37,6875	3438,3016
11:08	162	47,8392	54,9822	39,9348	15,0474	47,4585	4,1802	47,1122	47,8846	0,7724	47,4984	4,1802	154,4573	3592,7589
11:13	167	47,8392	54,6518	39,6369	15,0149	47,1444	4,1801	47,8846	47,3639	-0,5207	47,6243	4,1802	-104,1239	3488,6350
11:18	172	47,8392	52,4227	40,4504	11,9723	46,4366	4,1799	47,3639	47,6505	0,2866	47,5072	4,1802	57,3136	3545,9486
11:23	177	47,8392	52,3856	40,9824	11,4032	46,6840	4,1800	47,6505	47,9929	0,3423	47,8217	4,1803	68,4596	3614,4082
11:28	182	47,8392	51,9547	41,0465	10,9081	46,5006	4,1799	47,9929	47,4713	-0,5216	47,7321	4,1802	-104,3100	3510,0982
11:33	187	47,8392	53,1177	41,7909	11,3268	47,4543	4,1802	47,4713	47,9240	0,4527	47,6976	4,1802	90,5388	3600,6370
11:38	192	47,8392	53,3249	42,4973	10,8277	47,9111	4,1803	47,9240	48,4414	0,5173	48,1827	4,1803	103,4600	3704,0971
11:43	197	47,8392	52,5071	42,7404	9,7667	47,6237	4,1802	48,4414	48,2295	-0,2119	48,3354	4,1804	-42,3673	3661,7297
11:48	202	47,8392	53,7667	43,7236	10,0431	48,7452	4,1805	48,2295	48,9223	0,6928	48,5759	4,1805	138,5580	3800,2878

Waktu		Massa air	Air sirkulasi					Air dalam TES					Perolehan kalor (Q collected)	
			Temp. masuk TES	Temp. keluar TES	Selisih temp.	Temp. rata2	Kalor jenis	Temp. awal	Temp. akhir	Selisih temp.	Temp. rata2	Kalor jenis	Sesaat	Kumulatif
Jam	Menit	(kg)	T1 (°C)	T2 (°C)	(°C)	(°C)	(kJ/kg.C)	(°C)	(°C)	(°C)	(°C)	(kJ/kg.C)	(kJ)	(kJ)
1	2	3	4	5	6 = 4-5	7 = (4+5)/2	8	9	10	11 = 10-9	12 = (9+10)/2	13	14 = 3x13x11	15
11:53	207	47,8392	53,4179	43,4436	9,9743	48,4308	4,1804	48,9223	48,3059	-0,6164	48,6141	4,1805	-123,2811	3677,006651
11:58	212	47,8392	55,9168	45,0711	10,8457	50,4940	4,1810	48,3059	49,4100	1,1041	48,8579	4,1805	220,8079	3897,8145
12:03	217	47,8392	56,0312	45,1152	10,9159	50,5732	4,1810	49,4100	49,8504	0,4404	49,6302	4,1807	88,0846	3985,8991
12:08	222	47,8392	60,0915	45,7301	14,3614	52,9108	4,1818	49,8504	49,9530	0,1026	49,9017	4,1808	20,5160	4006,4151
12:13	227	47,8392	62,2975	46,4668	15,8307	54,3821	4,1823	49,9530	51,4462	1,4932	50,6996	4,1811	298,6727	4305,0878
12:18	232	47,8392	58,5153	46,7300	11,7854	52,6226	4,1817	51,4462	51,4765	0,0303	51,4613	4,1813	6,0555	4311,1433
12:23	237	47,8392	62,3450	48,0385	14,3065	55,1917	4,1826	51,4765	52,1680	0,6915	51,8222	4,1814	138,3258	4449,4691
12:28	242	47,8392	61,7484	48,3223	13,4261	55,0354	4,1826	52,1680	52,7891	0,6212	52,4785	4,1816	124,2600	4573,7291
12:33	247	47,8392	57,0649	47,5383	9,5266	52,3016	4,1816	52,7891	52,1570	-0,6321	52,4731	4,1816	-126,4510	4447,2781
12:38	252	47,8392	62,7154	47,5619	15,1534	55,1387	4,1826	52,1570	51,9326	-0,2244	52,0448	4,1815	-44,8959	4402,3821
12:43	257	47,8392	60,5656	48,3699	12,1957	54,4678	4,1823	51,9326	52,7732	0,8406	52,3529	4,1816	168,1595	4570,5416
12:48	262	47,8392	63,7743	48,3472	15,4272	56,0608	4,1829	52,7732	52,9306	0,1574	52,8519	4,1818	31,4881	4602,0297
12:53	267	47,8392	65,0280	49,1168	15,9112	57,0724	4,1834	52,9306	53,6553	0,7247	53,2929	4,1819	144,9793	4747,0091
12:58	272	47,8392	64,9365	49,3430	15,5935	57,1397	4,1834	53,6553	54,2464	0,5912	53,9509	4,1822	118,2777	4865,2867
13:03	277	47,8392	63,2216	50,1964	13,0252	56,7090	4,1832	54,2464	55,1431	0,8967	54,6948	4,1824	179,4096	5044,6963
13:08	282	47,8392	64,3032	50,3316	13,9716	57,3174	4,1835	55,1431	55,2706	0,1275	55,2069	4,1826	25,5159	5070,2123
13:13	287	47,8392	62,1039	49,7425	12,3614	55,9232	4,1829	55,2706	54,5597	-0,7110	54,9151	4,1825	-142,2600	4927,9523
13:18	292	47,8392	65,2598	50,8011	14,4587	58,0305	4,1838	54,5597	56,0143	1,4547	55,2870	4,1826	291,0715	5219,0238
13:23	297	47,8392	64,4357	51,0310	13,4047	57,7334	4,1836	56,0143	56,2570	0,2427	56,1357	4,1830	48,5721	5267,5959
13:28	302	47,8392	60,4720	50,3638	10,1083	55,4179	4,1827	56,2570	55,7259	-0,5311	55,9915	4,1829	-106,2807	5161,3152
13:33	307	47,8392	60,7572	51,0396	9,7176	55,8984	4,1829	55,7259	55,7723	0,0464	55,7491	4,1828	9,2796	5170,5948
13:38	312	47,8392	57,6524	50,8186	6,8337	54,2355	4,1823	55,7723	55,3558	-0,4165	55,5640	4,1828	-83,3461	5087,2487
13:43	317	47,8392	56,5388	50,5848	5,9540	53,5618	4,1820	55,3558	55,2142	-0,1416	55,2850	4,1826	-28,3375	5058,9112
13:48	322	47,8392	55,6172	50,8979	4,7194	53,2575	4,1819	55,2142	54,8404	-0,3737	55,0273	4,1825	-74,7815	4984,1297
13:53	327	47,8392	54,2653	50,9569	3,3084	52,6111	4,1817	54,8404	54,9326	0,0922	54,8865	4,1825	18,4467	5002,5764
13:58	332	47,8392	54,2346	50,8908	3,3438	52,5627	4,1817	54,9326	54,7154	-0,2172	54,8240	4,1825	-43,4538	4959,1226
14:03	337	47,8392	56,2008	51,6952	4,5056	53,9480	4,1822	54,7154	54,8073	0,0918	54,7614	4,1824	18,3772	4977,4999
14:08	342	47,8392	56,3957	51,5726	4,8232	53,9841	4,1822	54,8073	54,7129	-0,0944	54,7601	4,1824	-18,8823	4958,6176
14:13	347	47,8392	55,6476	51,1759	4,4718	53,4117	4,1820	54,7129	54,5295	-0,1834	54,6212	4,1824	-36,6892	4921,9284
14:18	352	47,8392	54,4005	51,2338	3,1667	52,8171	4,1818	54,5295	54,1707	-0,3589	54,3501	4,1823	-71,8048	4850,1235

Waktu		Energi matahari yang terjadi (Q incident)				Efisiensi	Laju aliran massa thermosyphon			Instantaneous	Perolehan energi		
		Luas kolektor	Radiasi	Sesaat (kJ)	Kumulatif (kJ)	kumulatif	(kg/detik)	vol. spesifik	(lt/menit)	heat stored	Sesaat	Akumulasi	
		(m2)	(W/m2)	(kJ)	(kJ)	(%)		(m^3/kg)		(W)	(kW.detik)	(kW.detik)	(MJ)
		16	17	18 = 16x17xt	19	20 = 15/19	21 = (20/100)x16x17/(6x8x1000)	22	23 = 21x22x1000x60	24 = 21x6x8x1000	= 24xt/10	26	27 = 26/1000
8:27	1	1,9	220,6	25,1484	25,1484	0	0	0,001004989	0	0	0	0	0
8:28	2	1,9	303,1	34,5534	59,7018	31,81613746	0,00709076	0,001004836	0,427503057	183,225954	10,99356	10,99355724	0,010993557
8:33	7	1,9	566,9	64,6266	124,3284	56,93745011	0,033128533	0,001004739	1,997130875	613,2789689	36,79674	47,79029538	0,047790295
8:38	12	1,9	714,4	81,4416	205,77	88,0620155	0,019855075	0,001006492	1,199038004	1195,318574	71,71911	119,5094098	0,11950941
8:43	17	1,9	703,1	80,1534	285,9234	167,5823929	0,026969776	0,001007603	1,630490042	2238,716428	134,323	253,8323955	0,253832395
8:48	22	1,9	555,6	63,3384	349,2618	192,1921624	0,023766291	0,001007767	1,437053533	2028,857343	121,7314	375,5638361	0,375563836
8:53	27	1,9	220,6	25,1484	374,4102	202,2515162	0,010210419	0,001007486	0,617211119	847,7170051	50,86302	426,4268564	0,426426856
8:58	32	1,9	225,6	25,7184	400,1286	195,1410258	0,015209097	0,00100635	0,918340831	836,452493	50,18715	476,6140059	0,476614006
9:03	37	1,9	299,4	34,1316	434,2602	194,8419448	0,01841892	0,001006727	1,112569802	1108,377887	66,50267	543,1166792	0,543116679
9:08	42	1,9	306,9	34,9866	469,2468	212,2235418	0,017079072	0,001007458	1,032386875	1237,496694	74,2498	617,3664808	0,617366481
9:13	47	1,9	896,9	102,2466	571,4934	174,7849614	0,031459023	0,001008184	1,90298977	2978,528005	178,7117	796,0781612	0,796078161
9:18	52	1,9	191,9	21,8766	593,37	185,3462705	0,009822409	0,001006903	0,593412533	675,7910368	40,54746	836,6256234	0,836625623
9:23	57	1,9	160,6	18,3084	611,6784	168,7040018	0,011581089	0,00100583	0,698916587	514,7833912	30,887	867,5126268	0,867512627
9:28	62	1,9	163,1	18,5934	630,2718	174,0553379	0,014294233	0,001005787	0,862617067	539,3800867	32,36281	899,875432	0,899875432
9:33	67	1,9	155,6	17,7384	648,0102	177,7559734	0,014326542	0,001005886	0,864652383	525,5177597	31,53107	931,4064976	0,931406498
9:38	72	1,9	243,1	27,7134	675,7236	169,7380388	0,020303079	0,001005983	1,225472582	784,0030272	47,04018	978,4466793	0,978446679
9:43	77	1,9	439,4	50,0916	725,8152	165,0695358	0,027052394	0,001006636	1,633915406	1378,099526	82,68597	1061,132651	1,061132651
9:48	82	1,9	335,6	38,2584	764,0736	175,3243739	0,018504871	0,001007299	1,118396043	1117,938338	67,0763	1128,208951	1,128208951
9:53	87	1,9	276,9	31,5666	795,6402	172,7895411	0,01538608	0,001007195	0,929806849	909,0630547	54,54378	1182,752734	1,182752734
9:58	92	1,9	258,1	29,4234	825,0636	183,426737	0,017319365	0,001007165	1,046607613	899,5063754	53,97038	1236,723117	1,236723117
10:03	97	1,9	259,4	29,5716	854,6352	169,6760376	0,017078478	0,001007063	1,031946668	836,2653191	50,17592	1286,899036	1,286899036
10:08	102	1,9	404,4	46,1016	900,7368	189,3647277	0,023202487	0,00100814	1,403481882	1455,002822	87,30017	1374,199205	1,374199205
10:13	107	1,9	553,1	63,0534	963,7902	192,2884043	0,029705816	0,001008496	1,797492551	2020,739612	121,2444	1495,443582	1,495443582
10:18	112	1,9	729,4	83,1516	1046,9418	199,3142156	0,033624826	0,001009718	2,037094736	2762,215988	165,733	1661,176541	1,661176541
10:23	117	1,9	453,1	51,6534	1098,5952	191,6603622	0,020942548	0,001009261	1,268190216	1649,984892	98,99909	1760,175635	1,760175635
10:28	122	1,9	771,9	87,9966	1186,5918	201,9922032	0,033100828	0,001010293	2,006491354	2962,437851	177,7463	1937,921906	1,937921906
10:33	127	1,9	644,4	73,4616	1260,0534	214,4483031	0,03077773	0,001010618	1,866271754	2625,619243	157,5372	2095,459061	2,095459061
10:38	132	1,9	1016,9	115,9266	1375,98	200,9680838	0,039815911	0,001011335	2,416032644	3882,924443	232,9755	2328,434527	2,328434527
10:43	137	1,9	1015,6	115,7784	1491,7584	214,0679916	0,040715702	0,001011877	2,471956497	4130,741594	247,8445	2576,279023	2,576279023
10:48	142	1,9	1059,4	120,7716	1612,53	196,3525179	0,037543747	0,00101211	2,279904178	3952,301291	237,1381	2813,4171	2,8134171
10:53	147	1,9	908,1	103,5234	1716,0534	198,6838216	0,035667042	0,001011987	2,165675454	3428,070789	205,6842	3019,101348	3,019101348
10:58	152	1,9	386,9	44,1066	1760,16	193,1991479	0,020402307	0,001010491	1,23698043	1420,226256	85,21358	3104,314923	3,104314923
11:03	157	1,9	718,1	81,8634	1842,0234	186,6589528	0,032725398	0,001011395	1,985898817	2546,756086	152,8054	3257,120288	3,257120288
11:08	162	1,9	474,4	54,0816	1896,105	189,4810108	0,027152453	0,001010987	1,647047206	1707,906039	102,4744	3359,59465	3,35959465
11:13	167	1,9	401,9	45,8166	1941,9216	179,648602	0,021856819	0,001010848	1,325635262	1371,81469	82,30888	3441,903532	3,441903532
11:18	172	1,9	370,6	42,2484	1984,17	178,7119329	0,025145959	0,001010536	1,524654569	1258,382204	75,50293	3517,406464	3,517406464
11:23	177	1,9	371,9	42,3966	2026,5666	178,3513162	0,026439633	0,001010645	1,603264866	1260,248235	75,61489	3593,021358	3,593021358
11:28	182	1,9	376,9	42,9666	2069,5332	169,6082107	0,026638304	0,001010565	1,61518349	1214,581357	72,87488	3665,89624	3,66589624
11:33	187	1,9	434,4	49,5216	2119,0548	169,9171274	0,029619609	0,001010986	1,796699718	1402,428003	84,14568	3750,04192	3,75004192
11:38	192	1,9	379,4	43,2516	2162,3064	171,3030611	0,027282031	0,00101119	1,655238234	1234,855246	74,09131	3824,133235	3,824133235
11:43	197	1,9	379,4	43,2516	2205,558	166,0228272	0,029313844	0,001011061	1,778285029	1196,792152	71,80753	3895,940764	3,895940764

Waktu		Energi matahari yang terjadi (Q incident)				Efisiensi	Laju aliran massa thermosyphon			Instantaneous	Perolehan energi		
		Luas kolektor	Radiasi	Sesaat (kJ)	Kumulatif (kJ)	kumulatif	(kg/detik)	vol. spesifik	(lt/menit)	heat stored	Sesaat	Akumulasi	
		(m2)	(W/m2)	(kJ)	(kJ)	(%)		(m^3/kg)		(W)	(kW.detik)	(kW.detik)	(MJ)
		16	17	18 = 16x17xt	19	20 = 15/19	21 = (20/100)x16x17/(6x8x1000)	22	23 = 21x22x1000x60	24 = 21x6x8x1000	= 24xt/10	26	27 = 26/1000
11:48	202	1,9	421,9	48,0966	2253,6546	168,6277826	0,032195489	0,001011566	1,954071669	1351,737168	81,10423	3977,044994	3,977044994
11:53	207	1,9	386,9	44,1066	2297,7612	160,0256219	0,028212516	0,001011423	1,712088037	1176,364349	70,58186	4047,626855	4,047626855
11:58	212	1,9	469,4	53,5116	2351,2728	165,7746608	0,032604381	0,001012372	1,980465072	1478,477889	88,70867	4136,335528	4,136335528
12:03	217	1,9	418,1	47,6634	2398,9362	166,1527777	0,028919954	0,001012409	1,75672876	1319,901051	79,19406	4215,529591	4,215529591
12:08	222	1,9	544,4	62,0616	2460,9978	162,7963703	0,028038716	0,001013521	1,705069794	1683,900536	101,034	4316,563623	4,316563623
12:13	227	1,9	636,9	72,6066	2533,6044	169,9194947	0,031056379	0,001014241	1,889919279	2056,212797	123,3728	4439,936391	4,439936391
12:18	232	1,9	615,6	70,1784	2603,7828	165,5723079	0,039295774	0,001013382	2,389297567	1936,599942	116,196	4556,132388	4,556132388
12:23	237	1,9	491,9	56,0766	2659,8594	167,2821147	0,026127534	0,001014644	1,590608102	1563,435372	93,80612	4649,93851	4,64993851
12:28	242	1,9	714,4	81,4416	2741,301	166,8451979	0,040329097	0,001014565	2,454990619	2264,689978	135,8814	4785,819909	4,785819909
12:33	247	1,9	329,4	37,5516	2778,8526	160,0400857	0,025143564	0,001013227	1,528569041	1001,626881	60,09761	4845,917522	4,845917522
12:38	252	1,9	700,6	79,8684	2858,721	153,998314	0,032343197	0,001014617	1,968957572	2049,933157	122,996	4968,913511	4,968913511
12:43	257	1,9	530,6	60,4884	2919,2094	156,567789	0,030945541	0,001014283	1,883252904	1578,422508	94,70535	5063,618862	5,063618862
12:48	262	1,9	636,9	72,6066	2991,816	153,8206133	0,028844973	0,001015081	1,756798562	1861,398623	111,6839	5175,302779	5,175302779
12:53	267	1,9	659,4	75,1716	3066,9876	154,777576	0,029132778	0,001015596	1,775228189	1939,146339	116,3488	5291,651559	5,291651559
12:58	272	1,9	673,1	76,7334	3143,721	154,7620398	0,030340662	0,001015631	1,848894457	1979,236251	118,7542	5410,405734	5,410405734
13:03	277	1,9	565,6	64,4784	3208,1994	157,2438521	0,031013016	0,00101541	1,889455899	1689,805332	101,3883	5511,794054	5,511794054
13:08	282	1,9	464,4	52,9416	3261,141	155,4735678	0,023470476	0,001015722	1,430368734	1371,836572	82,31019	5594,104249	5,594104249
13:13	287	1,9	596,9	68,0466	3329,1876	148,022668	0,032466785	0,001015011	1,977248973	1678,73988	100,7244	5694,828641	5,694828641
13:18	292	1,9	600,6	68,4684	3397,656	153,606598	0,028976976	0,001016091	1,766594091	1752,866333	105,172	5800,000621	5,800000621
13:23	297	1,9	673,1	76,7334	3474,3894	151,6121338	0,034574511	0,001015937	2,107530762	1938,952418	116,3371	5916,337766	5,916337766
13:28	302	1,9	261,9	29,8566	3504,246	147,2874676	0,017334912	0,001014757	1,055443286	732,9171674	43,97503	5960,312797	5,960312797
13:33	307	1,9	480,6	54,7884	3559,0344	145,2808316	0,032637003	0,001014999	1,987590904	1326,617386	79,59704	6039,90984	6,03990984
13:38	312	1,9	248,1	28,2834	3587,3178	141,8120439	0,023389699	0,001014169	1,423265895	668,4877938	40,10927	6080,019107	6,080019107
13:43	317	1,9	141,9	16,1766	3603,4944	140,3890399	0,01520111	0,001013838	0,924687583	378,5028906	22,71017	6102,729281	6,102729281
13:48	322	1,9	281,9	32,1366	3635,631	137,0911869	0,037204992	0,001013689	2,262858373	734,2741059	44,05645	6146,785727	6,146785727
13:53	327	1,9	249,4	28,4316	3664,0626	136,5308659	0,046763981	0,001013376	2,843370677	646,965161	38,81791	6185,603637	6,185603637
13:58	332	1,9	268,1	30,5634	3694,626	134,2252947	0,048898173	0,001013353	2,973066646	683,7302289	41,02381	6226,62745	6,22662745
14:03	337	1,9	331,9	37,8366	3732,4626	133,3569929	0,044629372	0,001014027	2,715323455	840,9625329	50,45775	6277,085202	6,277085202
14:08	342	1,9	351,9	40,1166	3772,5792	131,4383959	0,043567531	0,001014045	2,650765745	878,810259	52,72862	6329,813818	6,329813818
14:13	347	1,9	341,9	38,9766	3811,5558	129,1317412	0,044856487	0,001013765	2,728434951	838,8527042	50,33116	6380,14498	6,38014498
14:18	352	1,9	289,4	32,9916	3844,5474	126,155904	0,052383094	0,001013476	3,185339841	693,6808537	41,62085	6421,765831	6,421765831

Lampiran 5. Temperatur PATS *charging* tanggal 25 November 2016

						TPCM di kapsul						Tair di dalam tangki							Temperatur permukaan tangki				
Waktu	Data ke-	T HTF dr kolektor	T HTF ke kolektor	T air dingin ke tangki	T air panas dr tangki	K3		K14		K24		Vert. atas	Vert. atas tengah	Hor. Kanan	Vert. tengah	Hor. Kiri	Vert. bawah-tengah	Vert. bawah	Bawah	Tengah	Atas	Kanan	Kiri
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22
7:36	1	22,75764	27,04919	27,68825	28,66178	27,20512	27,10095	26,78714	40,90883	25,97391	26,68032	26,81382	26,63828	19,95358	26,55758	35,20073	32,4043	24,87146	28,30322	28,51187	28,92474	28,43069	28,18826
7:41	6	31,41995	27,52291	28,81124	28,12178	28,11157	28,15391	27,6937	27,62089	27,17858	27,77441	30,58341	27,91198	20,7984	27,79734	27,82694	27,74363	27,44055	28,33725	28,65304	29,60172	28,64401	28,29421
7:46	11	35,7827	27,20068	28,84818	28,03084	27,93265	28,1188	27,51476	27,33306	27,1967	27,64873	32,48834	27,96613	20,2392	27,67148	27,66534	27,47156	27,34889	28,21061	28,52674	32,86487	28,83997	28,13136
7:51	16	38,1354	27,80941	29,674	29,57296	29,22552	29,27054	28,05271	27,98108	27,57055	28,132	35,50399	29,41938	20,68809	28,22744	28,22036	27,70526	27,81885	28,78364	29,09824	35,60597	29,6997	28,74156
7:56	21	37,76383	27,39928	29,371	30,31528	29,71343	29,75962	27,6418	27,641	27,35646	27,88108	36,13196	29,88708	20,25579	27,90415	27,82569	27,85128	27,59139	28,415	28,90926	35,88022	29,65354	28,44394
8:01	26	38,29381	27,75356	29,68998	31,40071	30,7862	30,76297	27,88884	27,78058	27,58456	28,00223	36,80654	30,83364	20,2691	28,06148	28,01873	27,61055	27,74705	28,60504	29,17022	36,56655	30,16587	28,70619
8:06	31	38,78354	27,85204	30,07633	32,17584	31,7102	31,83311	28,31119	28,20435	27,66258	28,18846	37,57859	31,88036	20,38385	28,39199	28,2768	27,94374	27,73454	28,59264	29,40794	37,05182	30,65478	28,87328
8:11	36	39,03458	27,78192	30,18587	32,9297	32,39346	32,48204	28,52862	28,45857	27,6884	28,1065	37,98643	32,65904	20,30157	28,59794	28,41054	28,04248	27,84562	28,63103	29,69623	37,62279	31,23001	29,09123
8:16	41	39,78811	28,07475	30,587	33,72557	33,1521	33,27841	28,96569	28,93316	27,93859	28,42965	38,82074	33,44685	20,91462	28,9934	28,80539	27,96943	28,03575	28,8552	30,20533	38,27117	31,84743	29,45935
8:21	46	40,31445	28,06705	30,83087	34,30464	33,86115	34,02504	29,46109	29,4302	28,00878	28,50013	39,44511	34,26909	21,16573	29,3518	29,19918	28,40348	27,93455	28,75495	30,42672	38,73983	32,28384	29,71776
8:26	51	40,22815	27,94414	30,70779	34,82095	34,27583	34,33299	29,62549	29,55909	28,13628	28,5922	39,81213	34,68293	21,43846	29,62382	29,39893	28,15283	28,11808	28,95023	30,9068	39,11074	32,94349	30,16441
8:31	56	40,13558	28,49676	31,11743	35,33114	35,14952	35,31642	30,43	30,4023	28,45217	28,98129	39,84081	35,42809	21,97304	30,22892	30,03902	28,63517	28,28658	29,1037	31,45211	39,12084	33,52545	30,64084
8:36	61	39,23461	27,8758	30,4956	34,91037	34,81647	35,01848	30,0241	29,99506	28,10706	28,56286	39,15816	35,15472	21,62542	30,02606	29,80058	28,1402	27,78823	28,53834	31,13885	38,52522	33,28314	30,32594
8:41	66	39,92602	27,81896	30,51057	35,18474	35,15359	35,32051	30,50963	30,51821	28,35413	28,84691	39,60662	35,58051	22,05456	30,52593	30,29969	28,46324	28,10219	28,77773	31,66256	39,01083	33,8077	30,74482
8:46	71	43,7193	28,4534	31,18181	35,80394	36,17985	36,34915	31,46346	31,47516	28,6979	29,29989	41,36424	36,31735	22,65305	31,23056	30,93149	28,99306	28,40381	29,11237	32,28095	41,11531	34,53418	31,33062
8:51	76	45,28894	28,60478	31,22561	37,42766	36,72418	36,82307	31,57895	31,55504	29,1789	29,63917	43,25287	37,26247	23,24548	31,71354	31,41377	29,19049	28,81985	29,52455	33,04756	43,18745	35,48041	32,10129
8:56	81	44,04848	29,07293	31,51483	38,8432	37,94136	38,04313	32,11887	32,02475	29,64786	30,07417	43,74199	38,37364	23,93368	32,22034	31,91982	29,52088	29,06249	29,80075	33,643	43,35428	36,21935	32,66406
9:01	86	43,63315	29,01211	31,20244	38,93196	38,34522	38,44797	32,12978	32,10767	29,79802	30,29677	43,09027	38,8448	24,30081	32,51471	32,14207	30,2168	29,11639	29,71094	33,80297	42,66377	36,48651	32,75328
9:06	91	43,37281	29,03616	31,04688	38,66978	38,6192	38,6868	32,29728	32,27572	29,92221	30,27785	42,89864	39,04015	33,00116	32,6394	32,23073	29,72652	29,06728	29,59068	33,93263	42,54484	36,68764	32,84782
9:11	96	41,50394	28,87192	30,55887	38,08319	38,63424	38,80927	32,49168	32,47076	29,80832	30,19938	42,372	38,92647	32,95875	32,52505	32,1524	29,79231	28,79768	29,14446	33,73818	41,53684	36,49296	32,65234
9:16	101	42,04851	29,27772	30,82176	38,43439	39,10969	39,21426	33,21989	33,2733	30,21628	30,60906	41,83112	39,04818	33,68874	33,18584	32,77643	30,4233	29,37059	29,67641	34,48072	41,53169	37,12948	33,36308
9:21	106	43,98164	30,00934	31,30351	38,69602	39,69538	39,80135	34,13018	34,07872	30,85844	31,2898	42,59322	40,15293	34,3668	33,93808	33,52759	30,71198	29,81643	30,18981	35,16908	42,32306	37,74748	34,09092
9:26	111	44,58986	29,83483	30,80519	38,67497	39,34315	39,48404	33,91998	33,93972	30,90692	31,30262	43,61106	39,80901	34,52252	34,05847	33,68365	30,76115	29,83123	30,1329	35,29039	43,29337	37,86895	34,21288
9:31	116	41,55201	30,06775	30,9309	39,02814	39,89631	40,03851	34,58247	34,60437	31,19252	31,61781	43,39565	40,44328	34,9079	34,40937	33,99823	31,00693	30,08088	30,30873	35,53631	42,44071	38,07958	34,49589
9:36	121	39,92247	30,11093	30,65076	38,74444	39,83224	40,01007	34,87621	34,935	31,32237	31,75569	42,31525	39,86712	35,08094	34,65472	34,24324	31,32721	30,19053	30,38161	35,67989	41,27308	38,08089	34,676
9:41	126	42,35421	30,55375	30,62765	38,82593	39,59517	39,80822	35,0322	35,09148	31,91174	32,23995	41,98576	40,02772	35,59893	35,1387	34,69076	31,8523	30,8146	31,07165	36,29463	41,63757	38,5185	35,25827
9:46	131	44,11635	30,96936	30,79305	38,54935	39,75941	40,00861	35,51899	35,54396	32,08263	32,44741	43,15758	39,91309	35,87696	35,38187	34,96939	32,45981	30,85927	31,11592	36,48083	42,92083	38,56258	35,37398
9:51	136	46,13182	31,6426	31,3608	39,70113	40,57291	40,71673	36,33465	36,3264	32,7417	33,34479	44,75284	40,80582	36,59218	36,20709	35,79346	33,1485	31,59302	31,80734	37,23908	44,59549	39,3933	36,20778
9:56	141	45,05811	31,74039	31,24335	40,29046	40,84866	40,99312	36,30417	36,3317	32,98776	33,42803	45,00645	41,28069	36,78215	36,32611	35,91231	32,90701	31,72125	31,82716	37,22325	44,50901	39,4842	36,2633
10:01	146	43,51966	32,05058	31,26728	40,95515	41,33595	41,48157	36,70644	36,69941	33,41134	33,8892	44,55185	41,73937	37,06306	36,64381	36,22958	33,19179	32,35879	32,45906	37,9223	44,17937	40,11323	36,93035
10:06	151	43,57999	32,39766	31,36422	40,64901	41,61041	41,86385	37,19615	37,26246	33,50695	34,09265	44,05576	41,87048	37,44405	37,02614	36,68286	33,72264	32,33701	32,54467	38,00739	43,62737	40,16288	37,08728
10:11	156	43,98778	32,55805	31,20193	40,37274	41,52067	41,73672	37,3549	37,38587	33,70935	34,22425	43,9059	41,71641	37,53945	37,08609	36,67123	33,71089	32,63395	32,69604	38,08683	43,74189	40,20687	37,20283
10:16	161	43,65746	32,90503	31,15518	40,68854	41,47429	41,65595	37,48856	37,44826	34,24013	34,90041	44,35238	41,92609	38,07026	37,58301	37,13172	34,53057	33,2421	33,26308	38,68589	43,98504	40,70029	37,698
10:21	166	43,56255	33,23864	31,09508	40,44207	41,55725	41,73912	37,75039	37,71096	34,5312	34,97792	43,90771	41,93199	38,14747	37,69627	37,20911	34,25498	33,31683	33,37289	38,68853	43,56315	40,56069	37,73634
10:26	171	45,19081	33,59144	31,09028	40,41513	41,73072	41,94872	38,13861	38,17214	34,69991	35,2547	44,31426	41,99375	38,42317	37,97293	37,55683	34,5706	33,68585	33,66723	38,9811	44,27925	40,81825	38,06613
10:31	176	48,67959	34,07171	31,28555	40,98404	42,03131	42,17857	38,58272	38,54605	35,21998	35,77691	45,92764	42,47794	38,87206	38,45918	38,0781	38,16502	34,18966	34,23798	39,51293	46,2228	41,31554	38,52944
10:36	181	47,72251	33,99933	30,8894	41,97473	42,13735	42,28485	38,33183	38,15098	35,37173	35,89351	47,38941	42,95003	38,9882	38,53997	38,15879	35,68509	34,3285	34,16144	39,5078	47,13582	41,34596	38,52428
10:41	186	45,40248	34,55528	31,26872	42,63962	43,29702	43,51865	39,17296	39,13824	35,63053	36,26066	46,6378	43,63567	39,38955	38,94274	38,59668	36,16399	34,5339	34,54348	39,85208	46,03063	41,76194	38,94168
10:46	191	45,84285	34,60581	30,92429	42,83004	43,24058	43,46207	39,15206	39,11728	36,21797	36,70751	45,96304	43,90242	39,72781	39,24645	38,86427	38,77853	35,1227	35,05575	40,29035	45,76066	42,3076	39,45356
10:51	196	47,40994	35,32759	31,29102	42,75613	43,63956	43,8263	39,73047	39,66179	36,53181	37,09413	46,2681	44,14489	40,11297	39,70444	39,25024	37,00527	35,51564	35,44524	40,67751	46,49966	42,58891	39,77147
10:56	201	49,90823	36,38299	32,13734	43,49875	44,69167	44,8452	40,82072	40,82725	37,39793	37,99953	48,11251	44,97487	41,05049	40,64525	40,29672	37,30611	36,26749	36,29741	41,59548	48,0494	43,4376	40,62305

						T PCM di kapsul						T air di dalam tangki							Temperatur permukaan tangki				
Waktu	Data ke-	T HTF dr kolektor	T HTF ke kolektor	T air dingin ke tangki	T air panas dr tangki	K3		K14		K24		Vert. atas	Vert. atas-tengah	Hor. Kanan	Vert. tengah	Hor. Kiri	Vert. bawah-tengah	Vert. bawah	Bawah	Tengah	Atas	Kanan	Kiri
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22
11:01	206	52,74266	36,53246	32,03638	44,32656	44,73395	44,85192	40,64914	40,58354	37,73809	38,26966	49,75531	45,3859	41,284	40,84388	40,53071	37,14608	36,63828	36,52238	41,81911	49,82357	43,76812	40,84786
11:06	211	60,05188	37,54593	33,1639	47,33575	46,63292	46,6842	41,80459	41,63558	38,41893	39,09608	55,20537	47,59319	42,2495	41,84848	41,42696	38,16107	37,4594	37,37192	42,98219	55,3772	45,18158	41,8036
11:11	216	60,9186	38,53167	34,5143	51,63584	49,42525	49,76775	42,93216	42,73127	39,38692	40,10366	58,20394	51,04074	43,43083	42,96265	42,64636	39,03456	38,27243	38,14221	44,1015	57,92651	46,90502	42,74714
11:16	221	56,34577	38,49849	34,80352	52,98612	50,70416	51,40473	43,50427	43,59106	39,53088	40,17686	57,93096	52,45865	43,64583	43,17841	42,71941	39,93685	38,49188	38,18177	44,56518	57,15865	48,04193	43,11075
11:21	226	62,11592	39,67433	35,7712	53,82792	52,01532	52,71859	44,82111	44,80512	40,7511	41,33075	58,70249	54,06685	45,18917	44,62038	44,12382	41,32132	39,59906	39,2438	46,15016	59,04695	49,91123	44,56254
11:26	231	58,68114	39,15098	35,31645	54,14693	51,95531	52,87137	44,97424	45,03013	40,60196	41,07406	59,34414	54,58624	45,35573	44,75193	44,14851	40,30271	39,18296	38,64037	46,11623	59,08339	50,19543	44,49289
11:31	236	53,4059	38,94926	34,43254	53,62817	52,03808	52,77688	45,16404	45,22055	40,94703	41,31365	56,93064	53,94013	45,77161	45,16933	44,38755	39,96867	39,43186	38,86458	46,62134	56,70899	50,52414	45,17847
11:36	241	55,5597	40,69567	35,50941	53,10581	53,77425	54,05565	47,4045	47,50396	42,21241	42,83368	56,40367	54,31729	47,56806	46,86561	46,18839	42,07964	40,40774	39,9744	47,96989	56,01403	51,44988	46,60555
11:41	246	53,49687	40,85679	34,95504	52,58235	53,59172	53,80178	48,03791	48,13943	42,55899	43,17424	55,18504	53,70093	48,01325	47,38356	46,7412	42,56734	40,59153	40,2277	48,22127	54,75393	51,38551	47,07302
11:46	251	58,96165	41,71256	35,27959	51,82151	53,68883	53,86365	48,7741	48,87801	43,04078	43,66542	55,28137	53,48169	48,50204	47,94524	47,47962	43,09926	41,04022	40,53038	48,73328	55,54488	51,40185	47,55048
11:51	256	61,91137	42,42006	35,49097	53,27258	53,86217	54,07286	49,19624	49,33711	43,92842	44,62782	58,71974	54,33204	49,35358	48,83536	48,36851	44,14283	41,76	41,27953	49,44141	58,84601	52,11104	48,33337
11:56	261	59,08462	42,76107	35,58393	54,7652	54,97952	55,15738	49,60748	49,60736	44,45872	45,12471	59,37097	55,56781	49,52961	49,04754	48,72227	44,46504	42,23637	41,53874	49,62814	58,92653	52,43925	48,66285
12:01	266	59,62498	42,70279	34,84438	54,40085	54,7094	54,99295	49,01728	49,01521	44,81804	45,4144	57,8998	55,60837	49,53486	49,05281	48,6566	44,72166	42,79765	41,88222	49,72232	58,07358	52,53356	48,79296
12:06	271	60,18459	44,26261	35,70114	55,31995	56,04939	56,30063	50,39712	50,43517	46,00154	46,67381	58,84212	57,45966	50,68266	50,24018	49,87771	46,13691	44,01669	43,23308	50,99273	59,26756	53,80577	50,10548
12:11	276	55,47998	44,34734	34,89092	54,8208	55,74504	55,96016	50,37536	50,48447	46,28455	46,95795	57,74329	55,69468	50,78877	50,41766	49,98403	46,49554	44,29741	43,54691	50,9521	57,61428	53,65927	50,20625
12:16	281	57,88746	44,99788	34,86682	54,19678	55,40322	55,65296	50,56419	50,63836	46,82211	47,4622	56,99432	55,77241	51,11412	50,70866	50,34549	46,86128	44,91656	44,08996	51,20959	56,99369	53,59972	50,42968
12:21	286	61,43969	45,95548	35,76228	54,3569	55,72104	55,97151	51,16634	51,17138	47,26626	47,97915	57,83825	56,07482	51,59362	51,18984	50,86139	47,56245	45,57934	44,8535	51,82705	58,20523	54,00666	50,94421
12:26	291	63,60306	46,13024	35,65224	55,08909	55,57711	55,75641	50,59682	50,70666	47,30583	47,87692	60,55367	56,18497	51,27969	50,94578	50,58225	47,49508	45,86217	44,95676	51,648	60,65511	54,0036	50,79406
12:31	296	64,26779	47,42841	36,82035	58,05615	57,82408	57,79643	51,61092	51,65298	48,44952	49,23812	62,28004	58,59722	52,60025	52,27092	51,94086	48,9052	47,15	46,48173	53,12769	62,54675	55,62677	52,25168
12:36	301	63,45446	46,8905	36,02631	57,28056	58,02955	58,17928	50,78976	50,79357	47,99136	48,60076	61,59581	58,80984	51,89469	51,56291	51,23388	48,19006	46,47046	45,59543	52,07126	61,77614	55,02684	51,26045
12:41	306	64,49648	48,61566	37,48307	59,30831	60,34647	60,50174	52,44375	52,52407	49,18738	49,94349	62,61899	60,75398	53,34926	53,05795	52,72673	49,91485	48,03867	47,46902	53,8624	63,03266	57,02064	53,01454
12:46	311	63,90228	47,90959	36,55483	58,70245	59,60843	59,86796	51,45445	51,53153	48,84603	49,4944	62,4591	61,03635	53,03212	52,70429	52,37358	49,7724	47,80554	46,95473	53,38658	62,62935	56,62566	52,47658
12:51	316	64,10902	49,28667	37,48147	59,65458	61,15529	61,3125	52,79614	52,91312	49,60759	50,25908	62,82118	61,30291	53,97024	53,64566	53,31357	50,32952	48,77125	48,08921	54,47863	63,296	57,78942	53,5744
12:56	321	61,97713	49,22551	36,70391	59,33761	60,91827	61,11024	52,84116	53,13582	49,85017	50,43178	62,13176	61,052	54,24812	53,9245	53,52126	50,75422	48,98489	48,26566	54,47825	62,00148	57,82421	53,53869
13:01	326	61,23367	49,75066	36,76976	58,72866	60,91264	61,17522	53,54321	52,95261	49,75351	50,44102	60,90687	60,63864	54,22203	53,96546	53,59752	50,47367	49,08093	48,43163	54,71344	61,04575	57,77823	53,77514
13:06	331	62,81438	50,17523	36,8056	58,6557	60,66604	60,96335	54,0031	54,3014	50,40718	51,13278	60,8563	60,86842	55,08732	54,8374	54,46819	53,78374	49,72017	49,10077	55,37837	61,49823	58,37369	54,4789
13:11	336	63,771	49,61813	36,20606	58,00246	59,72333	60,08914	53,48146	54,06203	50,17337	50,89802	61,86311	60,38852	54,99467	54,74444	54,44604	51,86821	49,55766	48,83361	55,18314	62,10859	58,07266	54,21199
13:16	341	66,16378	51,53601	38,50431	60,46059	61,81035	62,07501	55,46974	56,16255	51,29341	52,27039	64,01212	62,31603	56,4669	56,32778	55,81515	52,50262	51,01431	50,56044	57,03943	64,55151	59,86136	56,00759
13:21	346	64,26418	50,0093	37,17455	59,82892	60,60646	61,0096	54,47376	54,84448	50,45434	51,28639	63,43738	61,44359	45,40243	55,34108	55,00645	51,54148	50,23165	49,53721	56,02273	63,67905	58,94864	54,98545
13:26	351	62,09516	49,73371	36,25141	59,35621	60,19098	60,59319	54,09222	54,14244	50,39028	51,04496	62,34783	61,55566	55,21152	54,92663	54,41592	51,15854	50,42054	49,4418	55,71725	62,47478	58,72222	54,72284
13:27	352	62,51917	50,76205	37,1847	59,88923	61,21538	61,61989	55,1908	55,24464	50,99127	51,71922	62,69167	61,80338	55,88286	55,68581	55,28002	52,03273	50,89854	50,05712	56,36382	62,82993	59,32536	55,39894

Lampiran 6. Olah data Temperatur dan radiasi matahari tanggal 25 November 2016

Waktu		T rata PCM	T rata air	K3 rata	K14 rata	K24 rata	Waktu		Solar Radiation, W/m²	Temp. udara luar, °C	Energi radiasi, MJ/m²	Akumulasi energi radiasi,
							0,315972		208,1	26,916	0	0
7:36	1	29,10938	27,49139	27,15303	33,84799	26,32711	0,316667	1	208,1	27,014	0,012486	0,012486
7:41	6	27,75551	27,15747	28,13274	27,65729	27,4765	0,320139	6	208,1	27,431	0,012486	0,075066
7:46	11	27,62412	27,26442	28,02573	27,42391	27,42272	0,323611	11	205,6	27,554	0,012336	0,13683
7:51	16	28,37207	28,2262	29,24803	28,0169	27,85128	0,327083	16	208,1	27,653	0,012486	0,198816
7:56	21	28,33223	28,20676	29,73652	27,6414	27,61877	0,330556	21	218,1	27,554	0,012864	0,262152
8:01	26	28,8009	28,47816	30,77458	27,83471	27,79339	0,334028	26	225,6	27,456	0,013464	0,328566
8:06	31	29,31832	28,88427	31,77165	28,25777	27,92552	0,3375	31	233,1	27,727	0,013764	0,396552
8:11	36	29,6096	29,12052	32,43775	28,4936	27,89745	0,340972	36	244,4	27,899	0,014436	0,467238
8:16	41	30,11627	29,56945	33,21525	28,94943	28,18412	0,344444	41	269,4	27,998	0,016836	0,544224
8:21	46	30,54773	29,96699	33,94309	29,44565	28,25446	0,347917	46	316,9	28,196	0,016086	0,62571
8:26	51	30,75365	30,17531	34,30441	29,59229	28,36424	0,351389	51	238,1	28,097	0,016986	0,715074
8:31	56	31,45529	30,63309	35,23297	30,41615	28,71673	0,354861	56	239,4	27,924	0,016014	0,787416
8:36	61	31,08734	30,24191	34,91748	30,00958	28,33496	0,358333	61	224,4	27,85	0,013386	0,85518
8:41	66	31,4505	30,66182	35,23705	30,51392	28,60052	0,361806	66	339,4	28,072	0,016764	0,938466
8:46	71	32,24424	31,41336	36,2645	31,46931	28,9989	0,365278	71	469,4	28,493	0,027414	1,05603
8:51	76	32,58322	32,12835	36,77362	31,567	29,40904	0,36875	76	409,4	28,692	0,025464	1,186722
8:56	81	33,30836	32,68183	37,99225	32,07181	29,86101	0,372222	81	320,6	28,742	0,019686	1,293336
9:01	86	33,5209	32,88941	38,39659	32,11872	30,04739	0,375694	86	344,4	28,345	0,020886	1,393044
9:06	91	33,67984	34,08627	38,653	32,2865	30,10003	0,379167	91	294,4	28,518	0,019164	1,492458
9:11	96	33,73561	33,93209	38,72175	32,48122	30,00385	0,382639	96	265,6	28,245	0,015936	1,574016
9:16	101	34,27374	34,33203	39,16197	33,24659	30,41267	0,386111	101	301,9	28,369	0,018336	1,659852
9:21	106	34,97565	35,01529	39,74837	34,10445	31,07412	0,389583	106	406,9	28,493	0,023286	1,760994
9:26	111	34,81607	35,18244	39,41359	33,92985	31,10477	0,393056	111	279,4	28,692	0,021864	1,878858
9:31	116	35,322	35,46318	39,96741	34,59342	31,40516	0,396528	116	195,6	28,692	0,011814	1,947522
9:36	121	35,45526	35,38271	39,92115	34,9056	31,53903	0,4	121	249,4	28,345	0,013614	2,00958
9:41	126	35,61313	35,72982	39,70169	35,06184	32,07585	0,403472	126	349,4	28,593	0,020214	2,098422
9:46	131	35,8935	36,08828	39,88401	35,53148	32,26502	0,406944	131	373,1	28,617	0,021114	2,202786
9:51	136	36,67286	36,9847	40,64482	36,33053	33,04324	0,410417	136	371,9	28,692	0,022764	2,33055
9:56	141	36,81558	37,13371	40,92089	36,31794	33,2079	0,413889	141	309,4	29,015	0,019986	2,437314
10:01	146	37,25399	37,39689	41,40876	36,70293	33,65027	0,417361	146	281,9	28,891	0,016164	2,521584
10:06	151	37,58874	37,59128	41,73713	37,22931	33,7998	0,420833	151	300,6	28,593	0,018114	2,610426
10:11	156	37,65529	37,60913	41,6287	37,37038	33,9668	0,424306	156	300,6	28,766	0,018336	2,701734
10:16	161	37,86793	38,11945	41,56512	37,46841	34,57027	0,427778	161	261,9	28,941	0,015864	2,786076
10:21	166	38,04447	38,06634	41,64819	37,73068	34,75456	0,43125	166	299,4	28,791	0,017364	2,868018
10:26	171	38,32413	38,35963	41,83972	38,15538	34,97731	0,434722	171	318,1	28,667	0,019386	2,963682
10:31	176	38,72259	39,4528	42,10494	38,56438	35,49845	0,438194	176	431,9	28,742	0,031986	3,087618
10:36	181	38,69504	39,43428	42,2111	38,2414	35,63262	0,441667	181	283,1	29,015	0,018714	3,213588
10:41	186	39,50301	39,70005	43,40783	39,1556	35,94559	0,445139	186	269,4	28,866	0,015336	3,298002
10:46	191	39,64958	40,22932	43,35132	39,13467	36,46274	0,448611	191	314,4	28,965	0,018564	3,386694
10:51	196	40,08068	40,28593	43,73293	39,69613	36,81297	0,452083	196	376,9	29,115	0,022314	3,49143
10:56	201	41,09705	41,23621	44,76844	40,82398	37,69873	0,455556	201	456,9	29,115	0,026286	3,610866
11:01	206	41,13772	41,65488	44,79293	40,61634	38,00387	0,459028	206	564,4	29,54	0,032736	3,75918

Waktu		T rata PCM	T rata air	K3 rata	K14 rata	K24 rata	Waktu		Solar Radiation , W/m²	Temp. udara luar, °C	Energi radiasi, MJ/m²	Akumulasi energi radiasi,
11:06	211	42,37872	43,42057	46,65856	41,72009	38,75751	0,4625	211	943,1	29,69	0,053886	3,985872
11:11	216	44,05783	45,0845	49,5965	42,83171	39,74529	0,465972	216	883,1	30,621	0,051786	4,246986
11:16	221	44,81866	45,48029	51,05444	43,54767	39,85387	0,469444	221	286,9	30,849	0,013164	4,454772
11:21	226	46,07367	46,8033	52,36696	44,81311	41,04093	0,472917	226	830,6	31,103	0,050514	4,677186
11:26	231	46,08451	46,81032	52,41334	45,00218	40,83801	0,476389	231	270,6	31,357	0,051864	4,928772
11:31	236	46,24337	46,51426	52,40748	45,19229	41,13034	0,479861	236	294,4	30,621	0,028314	5,057136
11:36	241	47,96408	47,69006	53,91495	47,45423	42,52305	0,483333	241	405,6	31,765	0,018864	5,162778
11:41	246	48,21735	47,74041	53,69675	48,08867	42,86662	0,486806	246	374,4	32,872	0,017064	5,250186
11:46	251	48,6518	48,11849	53,77624	48,82606	43,3531	0,490278	251	423,1	34,176	0,035364	5,38125
11:51	256	49,17077	49,35886	53,96752	49,26667	44,27812	0,49375	256	713,1	35,315	0,052764	5,569536
11:56	261	49,82253	49,84852	55,06845	49,60742	44,79171	0,497222	261	601,9	35,985	0,022764	5,754528
12:01	266	49,66121	49,75311	54,85117	49,01625	45,11622	0,500694	266	544,4	36,579	0,044514	5,939664
12:06	271	50,97628	51,03656	56,17501	50,41615	46,33768	0,504167	271	603,1	36,2	0,031986	6,110778
12:11	276	50,96792	50,77448	55,8526	50,42992	46,62125	0,507639	276	325,6	35,877	0,019314	6,229764
12:16	281	51,09051	50,95898	55,52809	50,60128	47,14215	0,511111	281	310,6	35,931	0,018414	6,360156
12:21	286	51,54595	51,52853	55,84627	51,16886	47,62271	0,514583	286	738,1	36,146	0,044436	6,489042
12:26	291	51,30329	51,84337	55,66676	50,65174	47,59137	0,518056	291	684,4	37,124	0,041964	6,691878
12:31	296	52,76201	53,39207	57,81026	51,63195	48,84382	0,521528	296	733,1	36,796	0,039486	6,892464
12:36	301	52,39738	52,82252	58,10441	50,79166	48,29606	0,525	301	656,9	35,128	0,039336	7,096722
12:41	306	54,15782	54,35149	60,42411	52,48391	49,56544	0,528472	306	678,1	31,459	0,009786	7,258914
12:46	311	53,46713	54,16905	59,73819	51,49299	49,17021	0,531944	311	689,4	31,944	0,040464	7,460406
12:51	316	54,67395	54,87919	61,2339	52,85463	49,93333	0,535417	316	616,9	31,103	0,038214	7,661148
12:56	321	54,71458	54,94525	61,01426	52,98849	50,14098	0,538889	321	480,6	31,026	0,030864	7,82649
13:01	326	54,79637	54,69787	61,04393	53,24791	50,09726	0,542361	326	483,1	31,153	0,026586	7,969926
13:06	331	55,24564	55,66022	60,8147	54,15225	50,76998	0,545833	331	626,9	30,773	0,033636	8,11989
13:11	336	54,73789	55,40895	59,90623	53,77174	50,5357	0,549306	336	653,1	31,23	0,038886	8,305776
13:16	341	56,51358	56,92213	61,94268	55,81615	51,7819	0,552778	341	679,4	32,073	0,041136	8,504862
13:21	346	55,44584	54,62915	60,80803	54,65912	50,87036	0,55625	346	648,1	32,665	0,028686	8,696376
13:26	351	55,07568	55,71952	60,39208	54,11733	50,71762	0,559722	351	479,4	31,204	0,031686	8,870412
13:27	352	55,99687	56,325	61,41763	55,21772	51,35524	0,560417	352	475,6	30,925	0,028764	8,899176

Lampiran 7. Olah data tanggal 25 November 2016

Massa air	T awal	T akhir	T rata	ΔT	cp	Q sensibel air
(kg)	(°C)	(°C)	(°C)	(°C)	(kJ/kg.°C)	(kJ)
1	2	3	4	5	6	7
47,8392	27,49	56,33	55,65	28,83	4,1828	5769,6421

Massa paraffin	T awal	T akhir	cp, parafin padat	cp,parafin cair	Titik lebur	L	Q sens par. padat	Q sens par. cair	Q laten
(kg)	(°C)	(°C)	(kJ/kg.°C)	(kJ/kg.°C)	(°C)	(kJ/kg)	(kJ)	(kJ)	(kJ)
8	9	10	11	12	13	14	15	16	17
7,76	29,11	56,00	2	2	52	173	355,28	62,03	1342,56

Massa tembaga	cp tembaga	T awal	T akhir	Q sens tembaga	Q total
(kg)	(kJ/kg.°C)	(°C)	(°C)	(kJ)	(kJ)
18	19	20	21	22	23
11,45	0,38	28,30	56,16	121,45	7650,9682

Lampiran 8. Olah data tanggal 25 November 2016

Waktu		Massa air	Air sirkulasi					Air dalam TES					Perolehan kalor (Q collected)	
			Temp. masuk TES	Temp. keluar TES	Selisih temp.	Temp. rata2	Kalor jenis	Temp. awal	Temp. akhir	Selisih temp.	Temp. rata2	Kalor jenis	Sesaat	Kumulatif
Jam	Menit	(kg)	T1 (°C)	T2 (°C)	(°C)	(°C)	(kJ/kg.C)	(°C)	(°C)	(°C)	(°C)	(kJ/kg.C)	(kJ)	(kJ)
1	2	3	4	5	6 = 4-5	7 = (4+5)/2	8	9	10	11 = 10-9	12 = (9+10)/2	13	14 = 3x13x11	15
7:35		47,8392												
7:36	1	47,8392	22,757642	27,0491928	-4,2915508	24,9034174	4,180293293	27,4913936	27,49139356	0	27,49139356	4,179525652	0	0
7:37	2	47,8392	27,5166668	27,1327628	0,383904	27,3247148	4,179567308	27,4913936	27,14946265	-0,34193091	27,3204281	4,179568393	0	0
7:38	3	47,8392	28,2921232	27,549466	0,7426572	27,9207946	4,179423015	27,1494627	27,16034889	0,01088624	27,15490577	4,179610806	2,176695385	2,176695385
7:42	7	47,8392	32,7275186	27,6139186	5,1136	30,1707186	4,178990339	27,1603489	27,29606708	0,135718189	27,22820799	4,179591898	27,13662552	29,31332091
7:47	12	47,8392	36,510458	27,3583408	9,1521172	31,9343994	4,178766062	27,2960671	27,49386948	0,197802399	27,39496828	4,179549626	39,54985979	68,8631807
7:52	17	47,8392	37,9132506	27,801091	10,1121596	32,8571708	4,178685974	27,4938695	28,2295095	0,735640021	27,86168949	4,179436746	147,0845356	215,9477163
7:57	22	47,8392	37,9182404	27,6266066	10,2916338	32,7724235	4,178692303	28,2295095	28,34901499	0,119505494	28,28926225	4,179340229	23,89348553	239,8412018
8:02	27	47,8392	38,3265866	27,6788836	10,647703	33,0027351	4,178675581	28,349015	28,58936627	0,24035128	28,46919063	4,17930155	48,05449922	287,895701
8:07	32	47,8392	38,7571856	27,825491	10,9316946	33,2913383	4,178656745	28,5893663	29,20914294	0,619776664	28,89925461	4,179213663	123,9120962	411,8077972
8:12	37	47,8392	39,1924938	27,6897782	11,5027156	33,441136	4,178647888	29,2091429	28,94922269	-0,25992025	29,07918281	4,179178778	-51,96548403	359,8423132
8:17	42	47,8392	39,8157796	28,1744232	11,6413564	33,9951014	4,17862052	28,9492227	29,80631036	0,85708767	29,37776652	4,179123307	171,3540373	531,1963504
8:22	47	47,8392	39,742543	27,4544402	12,2881028	33,5984916	4,178639256	29,8063104	29,63037948	-0,17593087	29,71834492	4,179063668	-35,1726392	496,0237112
8:27	52	47,8392	39,7508024	27,6781882	12,0726142	33,7144953	4,17863333	29,6303795	29,91642005	0,286040566	29,77339977	4,179054387	57,18597893	553,2096902
8:32	57	47,8392	39,9624968	28,1428618	11,819635	34,0526793	4,178618157	29,91642	30,37622405	0,459804	30,14632205	4,178994124	91,92389415	645,1335843
8:37	62	47,8392	39,4803772	28,1593806	11,3209966	33,8198789	4,178628267	30,376224	30,5190962	0,142872153	30,44766013	4,178948705	28,5626526	673,6962369
8:42	67	47,8392	40,8020642	27,9127698	12,8892944	34,357417	4,17860714	30,5190962	30,80580851	0,286712307	30,66245236	4,178918092	57,31840581	731,0146427
8:47	72	47,8392	44,2478566	28,4492892	15,7985674	36,3485729	4,178594944	30,8058085	31,51621592	0,710407409	31,16101221	4,178852603	142,0196517	873,0342944
8:52	77	47,8392	45,0989408	28,7355378	16,363403	36,9172393	4,178609802	31,5162159	32,17268166	0,65646574	31,84444879	4,178775204	131,2335821	1004,267877
8:57	82	47,8392	43,0831592	28,2899572	14,793202	35,6865582	4,178587737	32,1726817	32,26125147	0,088569811	32,21696656	4,178738902	17,70577189	1021,973648
9:02	87	47,8392	43,653558	28,8892456	14,7643124	36,2714018	4,178593541	32,2612515	32,7298625	0,468611027	32,49555698	4,178714414	93,67832216	1115,651971
9:07	92	47,8392	42,9567672	28,723716	14,2330512	35,8402416	4,178588429	32,7298625	33,83551499	1,105652493	33,28268874	4,178657275	221,023937	1336,675908
9:12	97	47,8392	41,675633	29,0809442	12,5946888	35,3782886	4,178588158	33,835515	34,21897482	0,383459827	34,0272449	4,17861919	76,65430935	1413,330217
9:17	102	47,8392	42,0271028	29,256124	12,7709788	35,6416134	4,178587648	34,2189748	34,30671873	0,087743913	34,26284677	4,178610292	17,54012869	1430,870346
9:22	107	47,8392	44,4140084	30,0515518	14,3624566	37,2327801	4,178621436	34,3067187	35,30831723	1,0015985	34,80751798	4,178595402	200,2202024	1631,090548
9:27	112	47,8392	44,2150996	30,0657892	14,1493104	37,1404444	4,178617783	35,3083172	35,45863607	0,150318844	35,38347665	4,178588131	30,04878407	1661,139332
9:32	117	47,8392	40,8824866	30,0741462	10,8083404	35,4783164	4,178587755	35,4586361	35,34939256	-0,10924351	35,40401432	4,17858803	-21,83781192	1639,30152
9:37	122	47,8392	40,3264716	30,4101342	9,9163374	35,3683029	4,178588212	35,3493926	35,67234098	0,322948417	35,51086677	4,17858768	64,5574828	1703,859003
9:42	127	47,8392	43,0945418	30,6910514	12,4034904	36,8927966	4,178609001	35,672341	35,78037619	0,108035217	35,72635859	4,178587859	21,59627235	1725,455275
9:47	132	47,8392	44,7404072	31,1691938	13,5712134	37,9548005	4,178656979	35,7803762	36,25524697	0,474870771	36,01781158	4,178589971	94,92685779	1820,382133
9:52	137	47,8392	46,1742732	31,6854734	14,4887998	38,9298733	4,17872423	36,255247	37,10489741	0,849650446	36,68007219	4,178602644	169,8459802	1990,228113
9:57	142	47,8392	44,8976042	31,9364396	12,9611646	38,4170219	4,178686139	37,1048974	37,20765541	0,102757996	37,15627641	4,178618395	20,54150431	2010,769618
10:02	147	47,8392	43,2986966	31,7563432	11,5423534	37,5275199	4,178634456	37,2076554	37,28969222	0,082036817	37,24867382	4,178622085	16,3993187	2027,168936
10:07	152	47,8392	43,9941576	32,7791424	11,2150152	38,38665	4,178684072	37,2896922	37,80378767	0,514095444	37,54673995	4,178635377	102,7690023	2129,937939
10:12	157	47,8392	44,2159902	32,6449058	11,5710844	38,430448	4,17868706	37,8037877	37,69917066	-0,10461701	37,75147916	4,178645727	-20,91326162	2109,024677
10:17	162	47,8392	43,2696972	32,6218234	10,6478738	37,9457603	4,178656459	37,6991707	37,84643832	0,147267663	37,77280449	4,178646861	29,43926571	2138,463943
10:22	167	47,8392	43,6271694	32,8387394	10,78843	38,2329544	4,178673935	37,8464383	37,84019283	-0,00624549	37,84331558	4,178650689	-1,248494099	2137,215449
10:27	172	47,8392	45,157574	33,557966	11,599608	39,35777	4,178760557	37,8401928	38,36399325	0,523800421	38,10209304	4,178665734	104,709813	2241,925262
10:32	177	47,8392	49,1859896	34,046881	15,1391086	41,6164353	4,179018494	38,3639933	39,50701403	1,143020781	38,93550364	4,178724682	228,4976791	2470,422941
10:37	182	47,8392	47,340398	34,4358658	12,9045322	40,8881319	4,178923415	39,507014	39,67567428	0,168660246	39,59134416	4,178782108	33,71680108	2504,139742
10:42	187	47,8392	44,7965272	34,3738654	10,4226618	39,5851963	4,178781525	39,6756743	39,61012255	-0,06555173	39,64289841	4,178787027	-13,10443538	2491,035306
10:47	192	47,8392	46,2792786	34,902589	11,3766896	40,5909338	4,178887831	39,6101225	40,06528136	0,455158814	39,83770195	4,178806144	90,99113669	2582,026443
10:52	197	47,8392	47,6454346	35,3864044	12,2590302	41,5159195	4,179004712	40,0652814	40,45064099	0,385359633	40,25796118	4,178850207	77,0383428	2659,064786
10:57	202	47,8392	50,036476	36,0484008	13,9880752	43,0424384	4,179236291	40,450641	40,91578128	0,465140284	40,68321114	4,178898678	92,98859883	2752,053385

Waktu		Massa air	Air sirkulasi					Air dalam TES					Perolehan kalor (Q collected)	
			Temp. masuk TES	Temp. keluar TES	Selisih temp.	Temp. rata2	Kalor jenis	Temp. awal	Temp. akhir	Selisih temp.	Temp. rata2	Kalor jenis	Sesaat	Kumulatif
Jam	Menit	(kg)	T1 (°C)	T2 (°C)	(°C)	(°C)	(kJ/kg.C)	(°C)	(°C)	(°C)	(°C)	(kJ/kg.C)	(kJ)	(kJ)
1	2	3	4	5	6 = 4-5	7 = (4+5)/2	8	9	10	11 = 10-9	12 = (9+10)/2	13	14 = 3x13x11	15
11:02	207	47,8392	54,294337	36,7806936	17,5136434	45,5375153	4,179713921	40,9157813	41,96919523	1,053413953	41,44248826	4,178994777	210,5982719	2962,651657
11:07	212	47,8392	59,972644	37,2516014	22,7210426	48,6121227	4,180462137	41,9691952	43,61852474	1,649329509	42,79385999	4,179195366	329,7493979	3292,401055
11:12	217	47,8392	61,2305982	38,812384	22,4182142	50,0214911	4,18086119	43,6185247	45,25416067	1,635635931	44,43634271	4,179488346	327,0345748	3619,435629
11:17	222	47,8392	57,0841964	38,1762394	18,907957	47,6302179	4,180204671	45,2541607	45,52228226	0,268121584	45,38822146	4,179681996	53,61161941	3673,047249
11:22	227	47,8392	62,480293	39,9725186	22,5077744	51,2264058	4,181229365	45,5222823	47,21834049	1,696058236	46,37031137	4,179899614	339,1489839	4012,196233
11:27	232	47,8392	57,6310858	39,7625566	17,8685292	48,6968212	4,180485143	47,2183405	47,45493928	0,236598793	47,33663989	4,180131025	47,31363637	4059,509869
11:32	237	47,8392	53,6748576	39,683647	13,9912106	46,6792523	4,17997175	47,4549393	47,25586842	-0,19907086	47,35540385	4,180135685	-39,80906554	4019,700804
11:37	242	47,8392	54,9787448	40,963427	14,0153178	47,9710859	4,180292113	47,2558684	47,82033232	0,564463894	47,53810037	4,180181396	112,8795331	4132,580337
11:42	247	47,8392	54,1481444	41,0508034	13,097341	47,5994739	4,180196886	47,8203323	47,81642834	-0,00390397	47,81838033	4,180252684	-0,780716274	4131,79962
11:47	252	47,8392	59,7601688	41,5240048	18,236164	50,6420868	4,181047744	47,8164283	48,38955086	0,573122516	48,1029896	4,180326505	114,6150327	4246,414653
11:52	257	47,8392	62,2216286	42,7695272	19,4521014	52,4955779	4,181643573	48,3895509	49,77035622	1,380805359	49,07995354	4,180590778	276,1557119	4522,570365
11:57	262	47,8392	57,8565662	42,3740154	15,4825508	50,1152908	4,180888965	49,7703562	49,59967776	-0,17067846	49,68501699	4,180762798	-34,13643376	4488,433931
12:02	267	47,8392	59,6858464	43,0130392	16,6728072	51,3494428	4,181268342	49,5996778	49,8463933	0,246715544	49,72303553	4,180773818	49,34431155	4537,778243
12:07	272	47,8392	59,0889736	44,2573416	14,831632	51,6731576	4,181372103	49,8463933	50,86355817	1,017164861	50,35497574	4,180960621	203,4470207	4741,225263
12:12	277	47,8392	55,7713422	44,6052124	11,1661298	50,1882773	4,180910681	50,8635582	50,68886234	-0,17469582	50,77621025	4,181088923	-34,94264961	4706,282614
12:17	282	47,8392	58,131542	45,3858172	12,7457248	51,7586796	4,181399808	50,6888623	50,98294089	0,294078544	50,83590162	4,181107347	58,82183469	4765,104449
12:22	287	47,8392	61,8761002	45,8640328	16,0120674	53,8700665	4,18212218	50,9829409	51,2531697	0,270228811	51,11805529	4,181195252	54,05252771	4819,156976
12:27	292	47,8392	62,907049	45,3090792	17,5979698	54,1080641	4,182208187	51,2531697	51,35410424	0,100934546	51,30363697	4,181253802	20,18971884	4839,346695
12:32	297	47,8392	64,5057492	47,7750286	16,7307206	56,1403889	4,182979858	51,3541042	53,6579851	2,30388086	52,50604467	4,181647101	460,8836526	5300,230348
12:37	302	47,8392	63,3689654	47,1940402	16,1749252	55,2815028	4,182645643	53,6579851	53,33446495	-0,32352016	53,49622503	4,181988942	-64,72441495	5235,505933
12:42	307	47,8392	64,3198212	48,3665212	15,9533	56,3431712	4,183060485	53,3344649	54,08939489	0,754929943	53,71192992	4,182065542	151,0363196	5386,542252
12:47	312	47,8392	64,1466056	48,4395626	15,707043	56,2930841	4,183040509	54,0893949	53,86823651	-0,22115838	53,9788157	4,182161365	-44,24743413	5342,294818
12:52	317	47,8392	63,6059748	49,2747746	14,3312002	56,4403747	4,183099365	53,8682365	54,90047578	1,032239269	54,38435615	4,182309186	206,5287045	5548,823523
12:57	322	47,8392	61,86218	49,6405428	12,2216372	55,7513614	4,182827016	54,9004758	55,11072386	0,210248084	55,00559982	4,182540791	42,06841417	5590,891937
13:02	327	47,8392	60,5971864	48,8620242	11,7351622	54,7296053	4,182437129	55,1107239	54,80528947	-0,30543439	54,95800667	4,182522828	-61,1139233	5529,778014
13:07	332	47,8392	62,6450784	49,6154718	13,0296066	56,1302751	4,182975854	54,8052895	55,28885375	0,48356428	55,04707161	4,182556473	96,75645205	5626,534466
13:12	337	47,8392	63,651432	49,2144334	14,4369986	56,4329327	4,183096383	55,2888538	55,2953871	0,006533346	55,29212043	4,182649703	1,3072873	5627,841753
13:17	342	47,8392	66,5196642	51,8242452	14,695419	59,1719547	4,184253081	55,2953871	57,10818338	1,812796281	56,20178524	4,1830042	362,7615182	5990,603271
13:22	347	47,8392	64,2688252	50,1908604	14,0779648	57,2298428	4,183420702	57,1081834	56,1157979	-0,99238548	56,61199064	4,183168376	-198,5956161	5792,007655
13:27	352	47,8392	62,5191744	50,7620522	11,7571222	56,6406133	4,183179932	56,1157979	56,32500226	0,20920436	56,22040008	4,183011592	41,86428786	5833,871943

Waktu	nergi matahari yang terjadi (Q incident)					Efisiensi	massa thermosyphon			Instantaneous	erolehan energi		
		Luas kolektor	Radiasi	Sesaat (kJ)	Kumulatif (kJ)	kumulatif	(kg/detik)	vol. spesifik	(lt/menit)	heat stored	Sesaat	Akumulasi	
Jam	Menit	(m2)	(W/m2)	(kJ)	(kJ)	(%)		(m³/kg)		(W)	(kW.detik)	(kW.detik)	(MJ)
1	2	16	17	18 = 16x17xt	19	20 = 15/19	21 = (20/100)x16 x17/(6x8x10 00)	22	23 = 21x22x1000x 60	24 = 21x6x8x1000	25 = 24xt/1000	26	27 = 26/1000
		1,9	208,1										
7:36	1	1,9	208,1	23,7234	23,7234	0	0	0,001002985	0	0	0	0	0
7:37	2	1,9	210,6	24,0084	47,7318	0	0	0,001003633	0	0	0	0	0
7:38	3	1,9	208,1	23,7234	71,4552	3,046237901	0,00388047	0,001003801	0,233713315	12,04452004	0,722671202	0,7226712	0,000722671
7:42	7	1,9	206,9	23,5866	95,0418	30,84255655	0,0056737	0,001004464	0,341941584	121,245174	7,274710442	7,99738164	0,007997382
7:47	12	1,9	205,6	23,4384	118,4802	58,12210032	0,00593674	0,001005016	0,357991329	227,0481727	13,62289036	21,620272	0,021620272
7:52	17	1,9	210,6	24,0084	142,4886	151,5543814	0,01435148	0,001005315	0,865666115	606,4297017	36,3857821	58,0060541	0,058006054
7:57	22	1,9	219,4	25,0116	167,5002	143,1886062	0,0138795	0,001005288	0,837173649	596,8960239	35,81376144	93,8198155	0,093819816
8:02	27	1,9	225,6	25,7184	193,2186	148,9999933	0,01435438	0,001005363	0,865881936	638,6735712	38,32041427	132,14023	0,13214023
8:07	32	1,9	233,1	26,5734	219,792	187,3625051	0,01816579	0,001005459	1,095897629	829,8097988	49,78858793	181,928818	0,181928818
8:12	37	1,9	248,1	28,2834	248,0754	145,0536059	0,01422567	0,001005509	0,858242285	683,7681931	41,02609158	222,954909	0,222954909
8:17	42	1,9	270,6	30,8484	278,9238	190,4449711	0,02012864	0,001005695	1,214596395	979,1537746	58,74922648	281,704136	0,281704136
8:22	47	1,9	294,4	33,5616	312,4854	158,7350037	0,01729197	0,001005562	1,043288217	887,9001166	53,274007	334,978143	0,334978143
8:27	52	1,9	254,4	29,0016	341,487	162,0002197	0,01552211	0,0010056	0,936542407	783,0442618	46,98265571	381,960799	0,381960799
8:32	57	1,9	221,9	25,2966	366,7836	175,8894303	0,0150146	0,001005715	0,906024456	741,5674269	44,49404561	426,454844	0,426454844
8:37	62	1,9	240,6	27,4284	394,212	170,8969379	0,01651449	0,001005636	0,996453757	781,238262	46,87429572	473,32914	0,47332914
8:42	67	1,9	410,6	46,8084	441,0204	165,7552899	0,02400929	0,001005818	1,448938896	1293,123319	77,58739914	550,916539	0,550916539
8:47	72	1,9	440,6	50,2284	491,2488	177,7173388	0,02253616	0,001006515	1,360979444	1487,74293	89,26457582	640,181115	0,640181115
8:52	77	1,9	369,4	42,1116	533,3604	188,2906711	0,01932742	0,00100672	1,167438474	1321,536904	79,29221425	719,473329	0,719473329
8:57	82	1,9	318,1	36,2634	569,6238	179,4120345	0,01754192	0,00100628	1,059124927	1084,348395	65,06090371	784,534233	0,784534233
9:02	87	1,9	338,1	38,5434	608,1672	183,4449425	0,01910122	0,001006488	1,153508743	1178,431966	70,70591798	855,240151	0,855240151
9:07	92	1,9	270,6	30,8484	639,0156	209,1773515	0,01808292	0,001006334	1,091847417	1075,464435	64,52786609	919,768017	0,919768017
9:12	97	1,9	271,9	30,9966	670,0122	210,9409675	0,0207065	0,001006172	1,25005758	1089,742132	65,38452793	985,152545	0,985152545
9:17	102	1,9	294,4	33,5616	703,5738	203,3717494	0,02131711	0,001006264	1,28703854	1137,580218	68,25481306	1053,40736	1,053407358
9:22	107	1,9	375,6	42,8184	746,3922	218,5299562	0,02598534	0,001006835	1,569777688	1559,51718	93,57103078	1146,97839	1,146978389
9:27	112	1,9	243,1	27,7134	774,1056	214,5882076	0,01676396	0,001006802	1,012678727	991,1614722	59,46968833	1206,44808	1,206448077
9:32	117	1,9	195,6	22,2984	796,404	205,8379315	0,01693789	0,001006207	1,022581063	764,9760887	45,89856532	1252,34664	1,252346642
9:37	122	1,9	270,6	30,8484	827,2524	205,9660393	0,02555619	0,001006168	1,54282944	1058,953794	63,53722766	1315,88387	1,31588387
9:42	127	1,9	348,1	39,6834	866,9358	199,0291871	0,02539795	0,001006712	1,534104936	1316,359141	78,98154843	1394,86542	1,394865418
9:47	132	1,9	411,9	46,9566	913,8924	199,1899849	0,02748891	0,001007102	1,661047376	1558,88074	93,53284443	1488,39826	1,488398263
9:52	137	1,9	364,4	41,5416	955,434	208,3061848	0,02382089	0,001007468	1,439926761	1442,228701	86,53372205	1574,93198	1,574931985
9:57	142	1,9	286,9	32,7066	988,1406	203,4902338	0,02048066	0,001007274	1,237778394	1109,245614	66,55473682	1641,48672	1,641486722
10:02	147	1,9	293,1	33,4134	1021,554	198,4397238	0,02291233	0,001006944	1,384285498	1105,090978	66,30545868	1707,79218	1,70779218
10:07	152	1,9	303,1	34,5534	1056,1074	201,6781569	0,02478329	0,001007263	1,497797288	1161,444337	69,68666025	1777,47884	1,777478841
10:12	157	1,9	291,9	33,2766	1089,384	193,5979119	0,02220621	0,001007279	1,342071285	1073,713379	64,42280277	1841,90164	1,841901643
10:17	162	1,9	263,1	29,9934	1119,3774	191,0404786	0,02146349	0,001007098	1,296950392	954,9922487	57,29953492	1899,20118	1,899201178
10:22	167	1,9	320,6	36,5484	1155,9258	184,8920968	0,02498266	0,001007205	1,509760171	1126,251718	67,5751031	1966,77628	1,966776281
10:27	172	1,9	324,4	36,9816	1192,9074	187,9379122	0,02389781	0,001007631	1,444809994	1158,374115	69,50244693	2036,27873	2,036278728
10:32	177	1,9	454,4	51,8016	1244,709	198,4739357	0,0270845	0,001008516	1,638908763	1713,544572	102,8126743	2139,0914	2,139091403
10:37	182	1,9	266,9	30,4266	1275,1356	196,3822312	0,01846706	0,001008226	1,117138082	995,8739325	59,75243595	2198,84384	2,198843839
10:42	187	1,9	289,4	32,9916	1308,1272	190,4276057	0,02404107	0,001007718	1,453597048	1047,085233	62,82511396	2261,66895	2,261668953
10:47	192	1,9	350,6	39,9684	1348,0956	191,531405	0,02683669	0,001008109	1,623258301	1275,867301	76,55203807	2338,22099	2,338220991
10:52	197	1,9	379,4	43,2516	1391,3472	191,1143952	0,02689152	0,001008476	1,627166495	1377,667229	82,66003374	2420,88102	2,420881024
10:57	202	1,9	481,9	54,9366	1446,2838	190,2844646	0,02980293	0,001009095	1,80443957	1742,263586	104,5358152	2525,41684	2,525416839

Waktu	hergi matahari yang terjadi (Q incident)					Efisiensi	h massa thermosyphon			Instantaneous	erolehan energi		
		Luas kolektor	Radiasi	Sesaat (kJ)	Kumulatif (kJ)	kumulatif	(kg/detik)	vol. spesifik	(lt/menit)	heat stored	Sesaat	Akumulasi	
Jam	Menit	(m2)	(W/m2)	(kJ)	(kJ)	(%)		(m^3/kg)		(W)	(kW.detik)	(kW.detik)	(MJ)
1	2	16	17	18 = 16x17xt	19	20 = 15/19	21 = (20/100)x16 x17/(6x8x10 00)	22	23 = 21x22x1000x 60	24 = 21x6x8x1000	25 = 24xt/1000	26	27 = 26/1000
11:02	207	1,9	716,9	81,7266	1528,0104	193,8894956	0,03607808	0,001010146	2,186648151	2640,988208	158,4592925	2683,87613	2,683876132
11:07	212	1,9	864,4	98,5416	1626,552	202,4159728	0,0349994	0,001011506	2,124125237	3324,398972	199,4639383	2883,34007	2,88334007
11:12	217	1,9	883,1	100,6734	1727,2254	209,552015	0,03751358	0,001012152	2,278166538	3516,052305	210,9631383	3094,30321	3,094303209
11:17	222	1,9	906,9	103,3866	1830,612	200,6458632	0,04374224	0,001011064	2,653572193	3457,348933	207,440936	3301,74414	3,301744145
11:22	227	1,9	830,6	94,6884	1925,3004	208,3932582	0,03494561	0,001012716	2,123398029	3288,737364	197,3242419	3499,06839	3,499068386
11:27	232	1,9	276,9	31,5666	1956,867	207,4494521	0,01461078	0,001011544	0,886766724	1091,412312	65,48473874	3564,55313	3,564553125
11:32	237	1,9	286,9	32,7066	1989,5736	202,0383063	0,01883169	0,001010643	1,141926606	1101,331011	66,07986068	3630,63299	3,630632986
11:37	242	1,9	275,6	31,4184	2020,992	204,4827657	0,01827595	0,001011216	1,108856394	1070,753554	64,24521327	3694,8782	3,694878199
11:42	247	1,9	444,4	50,6616	2071,6536	199,444522	0,03075884	0,00101105	1,865923553	1684,029766	101,041786	3795,91999	3,795919985
11:47	252	1,9	750,6	85,5684	2157,222	196,8464374	0,03681892	0,001012441	2,23661915	2807,305782	168,4383469	3964,35833	3,964358332
11:52	257	1,9	686,9	78,3066	2235,5286	202,3042946	0,03245927	0,001013321	1,973498707	2640,293579	158,4176148	4122,77595	4,122775947
11:57	262	1,9	358,1	40,8234	2276,352	197,1766199	0,02072537	0,001012195	1,258687066	1341,570004	80,49420026	4203,27015	4,203270147
12:02	267	1,9	641,9	73,1766	2349,5286	193,1356887	0,03378833	0,001012774	2,053196159	2355,502173	141,3301304	4344,60028	4,344600277
12:07	272	1,9	363,1	41,3934	2390,922	198,3011267	0,02205958	0,001012927	1,340685169	1368,059643	82,08357856	4426,68386	4,426683856
12:12	277	1,9	329,4	37,5516	2428,4736	193,7959142	0,02598054	0,001012229	1,577896002	1212,891109	72,77346651	4499,45732	4,499457322
12:17	282	1,9	536,9	61,2066	2489,6802	191,394238	0,03663445	0,001012968	2,226571302	1952,431762	117,1459057	4616,60323	4,616603228
12:22	287	1,9	665,6	75,8784	2565,5586	187,8404561	0,03547414	0,001013989	2,158223015	2375,505544	142,5303327	4759,13356	4,759133561
12:27	292	1,9	680,6	77,5884	2643,147	183,0903349	0,03216938	0,001014106	1,957389542	2367,614357	142,0568614	4901,19042	4,901190422
12:32	297	1,9	648,1	73,8834	2717,0304	195,0743852	0,03432381	0,001015121	2,090569121	2402,126472	144,1275883	5045,31801	5,04531801
12:37	302	1,9	639,4	72,8916	2789,922	187,6577887	0,03369764	0,001014689	2,05155643	2279,779412	136,7867647	5182,10478	5,182104775
12:42	307	1,9	664,4	75,7416	2865,6636	187,9684082	0,03555686	0,001015224	2,165890507	2372,837997	142,3702798	5324,47506	5,324475055
12:47	312	1,9	711,9	81,1566	2946,8202	181,2901519	0,0373216	0,001015198	2,273330141	2452,148724	147,1289235	5471,60398	5,471603978
12:52	317	1,9	571,9	65,1966	3012,0168	184,222861	0,03339154	0,001015273	2,034092491	2001,78403	120,1070418	5591,71102	5,59171102
12:57	322	1,9	498,1	56,7834	3068,8002	182,1849444	0,03372744	0,001014925	2,053848112	1724,180095	103,4508057	5695,16183	5,695161826
13:02	327	1,9	476,9	54,3666	3123,1668	177,0567622	0,03268699	0,001014413	1,989486928	1604,329028	96,25974167	5791,42157	5,791421568
13:07	332	1,9	588,1	67,0434	3190,2102	176,3687692	0,03615845	0,001015116	2,202301092	1970,726991	118,2436194	5909,66519	5,909665187
13:12	337	1,9	643,1	73,3134	3263,5236	172,446792	0,03489092	0,00101527	2,125421384	2107,110106	126,4266064	6036,09179	6,036091793
13:17	342	1,9	685,6	78,1584	3341,682	179,2691007	0,03797781	0,001016688	2,316694972	2335,231014	140,1138608	6176,20565	6,176205654
13:22	347	1,9	586,9	66,9066	3408,5886	169,9239285	0,03217369	0,001015677	1,96068437	1894,838719	113,6903231	6289,89598	6,289895977
13:27	352	1,9	475,6	54,2184	3462,807	168,4723389	0,03095398	0,001015375	1,885794285	1522,383443	91,34300657	6381,23898	6,381238984

Lampiran 9. Temperatur PATS *charging* tanggal 17 Desember 2016

						T PCM di kapsul						T air di dalam tangki							Temperatur permukaan tangki				
Waktu	Data ke-	T HTF dr kolektor	T HTF ke kolektor	T air dingin ke tangki	T air panas dr tangki	K3		K14		K24		Vert. atas	Vert. atas-tengah	Hor. Kanan	Vert. tengah	Hor. Kiri	Vert. bawah-tengah	Vert. bawah	Bawah	Tengah	Atas	Kanan	Kiri
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22
8:05	1	28,38555	28,10959	29,11148	28,5994	28,62742	28,70705	28,35346	28,13852	27,52566	28,4465	30,60752	28,36821	28,52362	28,36234	28,42693	28,31308	28,17518	29,02914	29,30736	29,5414	29,06614	28,9876
8:10	6	31,07292	28,07247	29,03828	28,77792	28,62619	28,70581	28,28031	28,24553	27,84012	28,40269	30,80968	28,64789	28,4081	28,42647	28,45499	29,64714	28,1499	29,0041	29,28238	29,96911	29,12312	29,05854
8:15	11	36,6753	28,24213	31,29362	29,0218	28,83213	29,05638	28,55818	28,41608	28,02127	28,54862	33,92041	28,97343	28,6973	28,71659	28,60089	29,93929	28,38401	29,20021	29,51369	34,5253	29,27018	29,19492
8:20	16	39,47723	28,1562	30,34505	29,79383	29,6087	29,65463	28,50804	28,40185	27,89636	28,56699	37,28372	29,81797	28,71564	28,66299	28,6552	29,08765	28,07784	28,96854	29,35409	37,42462	30,07071	28,99865
8:25	21	40,96337	28,21905	30,01252	31,37672	30,89279	30,86983	28,57101	28,46503	28,01236	28,57563	39,24003	31,22643	28,79601	28,67163	28,66382	28,26196	28,15679	28,86765	29,43209	38,85149	31,21424	28,93345
8:30	26	42,30965	28,35746	30,40287	33,25976	32,35889	32,41143	28,81752	28,71236	28,10479	28,74032	40,92784	32,86077	29,10387	28,90853	28,86439	28,24677	28,3127	29,12957	29,90753	40,43445	32,74444	29,42245
8:35	31	43,28834	28,55627	30,85362	34,99979	33,91967	33,94004	29,30418	29,20066	28,35397	28,99051	42,28001	35,2226	29,53285	29,30296	29,15041	28,24537	28,52959	29,41605	30,40736	41,62838	34,32243	29,87768
8:40	36	44,93374	28,64027	31,08151	36,54071	35,14952	35,1729	29,63982	29,50139	28,46216	29,17101	43,56921	35,9444	30,14874	29,7411	29,80334	28,79609	28,93312	29,7442	31,19832	43,01523	35,60066	30,52918
8:45	41	45,98217	29,01885	33,04041	38,10154	36,88663	36,84252	30,48579	30,2421	28,72703	29,50878	45,30971	37,38289	30,91002	30,50505	30,38652	29,20393	29,17767	30,16543	32,11734	44,63434	37,36024	31,38119
8:50	46	45,96201	29,14192	32,33805	39,18419	38,33163	38,25529	31,11155	31,08608	28,77811	29,59599	45,63605	38,79083	31,39098	30,98769	30,76075	29,25569	29,11932	29,92865	32,41628	44,64796	38,70291	31,57416
8:55	51	46,65142	29,26541	32,35398	39,92868	39,59721	39,59561	31,73746	31,60608	28,82589	29,78763	45,92454	39,94454	31,94008	31,61055	31,31094	29,44916	29,07983	29,85373	32,94758	45,03358	39,94802	31,96495
9:00	56	46,91633	29,42583	32,33508	40,99219	40,64885	40,75708	32,50762	32,37884	29,12791	30,19854	46,59719	41,27934	32,88636	32,16516	32,1874	29,71895	29,61755	30,35065	34,08327	45,94827	41,13406	32,99928
9:05	61	46,94716	29,70799	32,72526	41,98749	41,7139	41,78893	33,43493	33,16544	29,34041	30,73493	46,87184	42,38152	33,84986	33,09636	33,04538	30,26046	29,97634	30,67031	35,00638	46,40514	42,1415	33,85766
9:10	66	47,2746	30,07504	33,12863	42,56996	42,6489	42,7262	34,33908	34,2524	29,65548	31,2664	47,48764	43,86963	34,84379	34,38087	33,79075	30,7608	30,24491	30,97218	35,94685	46,70312	43,00087	34,69409
9:15	71	47,93516	30,02646	32,90057	42,55179	42,77871	43,0873	34,73704	34,68761	29,77768	31,56839	46,84509	43,81331	35,50166	34,82603	34,45011	31,10192	30,08203	30,70348	36,21314	46,93225	43,32751	34,99761
9:20	76	49,53942	30,7902	33,48594	43,63979	44,07168	44,22376	35,98405	35,93876	30,14726	32,26192	48,37774	44,35886	36,51331	35,91304	35,46404	31,87449	30,72583	31,23405	37,3371	48,11896	44,44278	36,05626
9:25	81	50,33998	31,17091	33,68785	44,49879	44,84128	44,99517	36,79332	36,71483	30,40685	32,73737	49,83726	45,15038	37,2719	36,7102	36,18862	32,39064	31,08616	31,55534	38,16088	49,18384	45,14108	36,77746
9:30	86	50,7677	31,92619	34,26504	45,99311	46,05366	46,21042	37,94037	37,86572	31,18622	33,73393	50,96948	46,38733	38,51312	37,88436	37,32549	33,28819	32,06441	32,48892	39,58473	50,31584	46,38368	38,13791
9:35	91	50,18235	32,12121	34,24528	45,79514	46,49608	46,72513	38,59933	38,59854	31,32523	34,05241	50,82775	46,73863	39,00815	38,3812	37,82169	33,60971	32,00736	32,11075	39,63503	49,62576	46,81488	38,15283
9:40	96	49,5962	32,74496	34,47587	46,17185	47,00885	47,27468	39,54292	39,61685	31,84589	34,61022	50,5717	47,22075	39,91923	39,2956	38,6992	34,35357	32,6067	32,63332	40,50825	49,50671	47,36719	39,03098
9:45	101	49,10819	33,00288	34,23245	45,97918	47,05184	47,4246	40,22836	40,23294	32,02944	35,00901	49,85183	47,40324	40,20908	39,80089	39,16816	34,79224	32,87944	32,83219	40,95372	48,99784	47,4341	39,47895
9:50	106	49,74116	33,71402	34,51519	46,66201	47,43853	47,77653	41,22282	41,23067	32,85095	35,93983	49,74881	47,75873	41,45519	40,76577	40,13182	35,94846	34,00564	33,9128	42,16748	49,6063	47,78014	40,73516
9:55	111	51,48473	34,40406	37,35545	46,57418	47,76899	48,14334	42,1247	42,20701	33,43023	36,66351	50,7578	47,87362	42,13936	41,48816	40,85331	36,20971	34,38455	34,21701	42,6463	50,43521	48,09316	41,25228
10:00	116	52,20048	35,1634	35,35957	47,57046	48,34608	48,5794	42,91743	43,00231	34,25241	37,59477	51,75992	48,97534	42,88789	42,45346	41,81737	37,58272	35,46837	35,32705	43,85357	51,77739	48,76079	42,43072
10:05	121	53,25036	35,86783	35,52893	48,44229	48,90422	49,20998	43,58419	43,27836	34,94209	38,42885	52,11678	49,626	43,61101	43,14347	42,54211	38,6408	36,20991	35,95518	44,54736	52,43255	49,25401	43,09283
10:10	126	54,30454	36,50555	35,70332	48,99248	49,39622	49,70309	44,11333	44,0593	35,65017	39,24551	53,45626	50,15323	44,38794	43,92315	43,32078	39,10474	36,82178	36,45483	45,11367	53,3478	49,84838	43,71644
10:15	131	55,31659	37,42206	36,4443	49,81214	50,44911	50,75839	45,13396	45,04766	36,29632	40,07137	53,87456	50,93784	45,0321	44,60524	43,96642	39,57829	37,45736	37,04932	45,63266	54,00476	50,86084	44,29084
10:20	136	55,23773	37,91282	36,25682	50,25553	50,68886	51,10524	45,41002	45,28896	36,87199	40,64818	53,2262	51,26274	45,4996	44,93193	44,43494	40,16067	38,01542	37,42454	45,93421	54,16416	50,95525	44,55853
10:25	141	56,077	38,33363	36,10664	50,55475	50,82374	51,31148	45,72307	45,60309	37,43618	41,32043	53,18684	51,75339	45,99118	45,4609	44,96319	40,76743	38,42701	37,79704	46,30374	54,42638	51,26585	44,85908
10:30	146	57,20188	38,47352	35,49507	50,45479	50,57298	51,09569	45,64931	45,63607	37,84857	41,66234	55,41036	52,02223	46,26053	45,58884	45,19759	41,0767	38,54819	37,70357	46,17568	54,88931	50,77941	44,68764
10:35	151	57,53367	39,77088	36,119	52,32608	51,75717	52,21144	46,90797	46,75634	38,55169	42,54493	57,25917	52,86359	47,06804	46,47048	46,00692	41,96787	39,65164	38,94018	47,36718	56,0113	52,09999	45,99948
10:40	156	59,06545	40,96379	36,60291	53,65449	52,83773	53,29435	48,09805	48,05732	39,82793	43,788	57,08456	55,86516	48,37612	47,81886	47,28243	43,51044	41,03672	40,34918	48,72982	57,26153	53,25237	47,3697
10:45	161	59,69757	41,38957	36,78077	53,9645	52,9782	53,43514	48,27441	48,19866	40,64694	44,39516	59,14738	54,73704	48,76799	48,24766	47,78165	43,80017	41,49493	40,55476	48,96906	57,95553	53,33519	47,53935
10:50	166	57,60833	41,12761	35,94425	53,53617	52,61133	53,06746	47,87104	47,7583	40,90945	44,65821	57,89061	55,21035	48,81741	48,26174	47,90215	44,31716	41,6334	40,58547	48,68214	57,00355	53,09508	47,56999
10:55	171	61,74097	43,34926	37,9304	55,77974	54,9284	55,10616	49,94626	49,73382	42,3468	46,1696	59,76208	56,92355	50,53435	49,98488	49,55187	46,3093	43,73191	43,09262	51,27591	60,74026	55,32876	49,92991
11:00	176	61,52193	43,87372	38,31541	57,23891	55,83908	55,59391	50,22157	50,08122	43,04224	46,86649	60,94936	57,12179	51,05129	50,59136	50,12207	46,42005	44,71251	43,8876	51,95925	60,61457	56,41534	50,68784
11:05	181	62,38149	44,9199	39,22585	57,45293	57,05661	57,2394	51,08875	50,88024	43,81989	47,61022	61,35889	57,96663	51,68573	51,24682	50,84744	47,22579	45,1086	44,28038	52,20831	61,52746	57,31755	50,93826
11:10	186	64,36407	46,03688	39,85057	58,83729	58,09741	58,31805	51,77896	51,43069	44,86545	48,58703	62,16507	58,97245	52,55234	52,11648	51,75125	48,21202	46,37111	45,53233	53,3455	63,18302	58,44132	52,11708
11:15	191	65,97493	46,70843	40,38416	59,41101	58,90674	59,16464	52,09387	51,92436	45,3786	49,06582	63,9627	59,76535	52,88783	52,52405	52,19362	48,76706	46,5607	45,64947	53,32112	63,75312	59,13586	52,09256
11:20	196	65,12173	46,20008	39,37193	59,48661	58,08338	59,01129	51,19813	50,99001	45,72526	49,12952	63,47652	60,21617	52,71881	52,38989	52,02426	48,73894	46,68066	45,48503	52,94682	63,45101	58,35308	51,77955
11:25	201	65,25136	46,8275	39,03946	59,37625	59,65997	59,91962	51,36454	51,19253	45,8354	49,02713	63,27497	60,53715	52,60205	52,20182	51,80106	48,90702	46,56111	45,4019	52,89946	63,08926	59,82652	51,70397

						T PCM di kapsul						T air di dalam tangki							Temperatur permukaan tangki				
Waktu	Data ke-	T HTF dr kolektor	T HTF ke kolektor	T air dingin ke tangki	T air panas dr tangki	K3		K14		K24		Vert. atas	Vert. atas-tengah	Hor. Kanan	Vert. tengah	Hor. Kiri	Vert. bawah-tengah	Vert. bawah	Bawah	Tengah	Atas	Kanan	Kiri
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22
11:30	206	66,40401	48,06355	39,71425	60,72872	61,38263	61,64631	52,52904	52,32549	47,21369	50,51518	64,4036	62,15559	54,04884	53,68912	53,39232	50,12299	47,75598	46,6932	54,21674	64,2939	61,69942	52,92239
11:35	211	67,32353	49,06378	40,2589	62,38779	62,65893	62,96086	53,49334	53,22211	48,02599	51,29404	65,29248	63,35102	55,07156	54,7508	54,31102	51,12394	49,22669	48,32861	55,84059	65,87342	63,14226	54,62579
11:40	216	67,65824	49,18969	39,74304	62,37183	62,9601	63,19217	53,86681	53,2419	48,35394	51,41033	65,74668	63,74775	55,39899	55,04397	54,63912	51,31285	49,13916	48,20645	55,7544	65,96229	63,32066	54,50383
11:45	221	65,10174	50,04043	40,17319	63,57143	64,05219	64,25159	55,10586	54,23717	49,11826	52,03503	66,8282	64,82468	56,19731	55,80971	55,36843	52,01495	50,25049	49,34384	56,77847	66,70124	64,38001	55,67467
11:50	226	67,60689	50,83587	40,36929	63,64342	64,17496	64,51564	56,0066	55,4605	49,98231	52,79526	65,75085	64,87665	56,95427	56,67539	56,12696	52,78237	51,03623	50,15834	57,69253	65,8653	64,60518	56,52313
11:55	231	69,34015	52,12666	41,67285	64,45023	65,45881	65,66154	57,64921	57,46326	50,80703	53,48079	67,74558	65,59242	58,05945	57,85502	57,12856	53,90278	51,8591	51,11552	58,92347	67,78819	65,74172	57,58069
12:00	236	68,71948	52,13592	41,53947	64,95098	65,67886	65,91735	57,94078	57,75583	51,36747	53,86603	68,25411	66,2558	58,58375	58,38112	57,79508	54,50569	52,25673	51,50977	59,3149	68,35204	66,03082	58,08385
12:05	241	67,05046	51,90025	40,73035	64,18559	65,3039	65,71763	58,02299	57,87374	51,27109	53,76938	66,72621	65,80872	58,27631	58,07264	57,62812	54,15833	51,83583	50,88061	58,76034	66,33488	65,61682	57,49101
12:10	246	67,41275	52,97213	41,38511	65,06865	66,01875	66,36369	59,37543	59,37231	52,20031	54,59532	66,94354	66,31293	59,59114	59,32134	58,66352	55,17026	53,33695	52,47501	60,55346	67,31814	66,2466	59,18832
12:11	247	66,40772	53,01839	41,39618	65,01845	65,95939	66,33939	59,63317	59,59551	52,41316	54,84415	66,87658	66,45477	59,8388	59,49927	58,91172	55,06469	53,42831	52,56561	60,6784	67,37285	66,35854	59,34918
12:12	248	65,68317	53,38299	41,62192	65,32171	66,32215	66,59736	60,06764	60,10218	52,52953	55,03156	67,02359	66,5707	59,95497	59,72172	59,09864	55,21818	53,77152	52,94119	61,01626	67,43038	66,63894	59,72409

Lampiran 10. Olah data Temperatur dan radiasi matahari tanggal 17 Desember 2016

Waktu		T rata PCM	T rata air	K3 rata	K14 rata	K24 rata	Waktu		Solar Radiation, W/m²	Temp. udara luar, °C	Energi radiasi, MJ/m²	Akumulasi energi radiasi,
							0	0,336111	189,4	27,136	0	0
8:05	1	28,29976701	28,68241	28,66723	28,24599	27,98608	1	0,336806	194,4	27,186	0,011364	0,011364
8:10	6	28,35010863	28,93488	28,666	28,26292	28,1214	6	0,340278	221,9	27,333	0,013014	0,073206
8:15	11	28,57211129	29,60456	28,94426	28,48713	28,28495	11	0,34375	248,1	27,825	0,014586	0,143064
8:20	16	28,77276081	30,043	29,63167	28,45494	28,23167	16	0,347222	273,1	27,924	0,015864	0,2199
8:25	21	29,23110785	30,43095	30,88131	28,51802	28,29399	21	0,350694	296,9	28,147	0,017364	0,303036
8:30	26	29,85755106	31,03212	32,38516	28,76494	28,42255	26	0,354167	341,9	28,32	0,022836	0,399522
8:35	31	30,61817311	31,75197	33,92986	29,25242	28,67224	31	0,357639	461,9	28,841	0,027264	0,523386
8:40	36	31,18279988	32,41943	35,16121	29,57061	28,81659	36	0,361111	534,4	29,265	0,030936	0,6708
8:45	41	32,11547624	33,26797	36,86458	30,36394	29,11791	41	0,364583	494,4	29,916	0,030114	0,824064
8:50	46	32,85977409	33,7059	38,29346	31,09881	29,18705	46	0,368056	471,9	29,765	0,027186	0,9657
8:55	51	33,52498151	34,17995	39,59641	31,67177	29,30676	51	0,371528	469,4	29,991	0,028914	1,108692
9:00	56	34,26980711	34,92171	40,70296	32,44323	29,66323	56	0,375	463,1	29,79	0,027936	1,247178
9:05	61	35,02975602	35,64025	41,75141	33,30018	30,03767	61	0,378472	438,1	30,925	0,027336	1,382436
9:10	66	35,81474406	36,48263	42,68755	34,29574	30,46094	66	0,381944	463,1	30,925	0,027414	1,516872
9:15	71	36,10612338	36,66002	42,93301	34,71233	30,67304	71	0,385417	493,1	30,444	0,030264	1,661586
9:20	76	37,10457139	37,6039	44,14772	35,9614	31,20459	76	0,388889	561,9	30,495	0,032886	1,818372
9:25	81	37,74813592	38,37645	44,91822	36,75408	31,57211	81	0,392361	546,9	30,9	0,033864	1,985136
9:30	86	38,83172219	39,49034	46,13204	37,90305	32,46008	86	0,395833	524,4	31,74	0,031086	2,14545
9:35	91	39,29945237	39,77064	46,6106	38,59893	32,68882	91	0,399306	454,4	31,331	0,029286	2,294964
9:40	96	39,98323408	40,38096	47,14177	39,57988	33,22805	96	0,402778	439,4	31,281	0,026514	2,429028
9:45	101	40,32936253	40,58641	47,23822	40,23065	33,51922	101	0,40625	423,1	30,596	0,025464	2,55927
9:50	106	41,07655421	41,40206	47,60753	41,22675	34,39539	106	0,409722	498,1	30,469	0,027636	2,691084
9:55	111	41,72296209	41,95807	47,95617	42,16585	35,04687	111	0,413194	499,4	31,001	0,029514	2,84217
10:00	116	42,4487341	42,99215	48,46274	42,95987	35,92359	116	0,416667	478,1	31,382	0,029136	2,994234
10:05	121	43,05794895	43,69858	49,0571	43,43128	36,68547	121	0,420139	568,1	31,765	0,032964	3,14967
10:10	126	43,6946035	44,45255	49,54966	44,08632	37,44784	126	0,423611	559,4	31,97	0,033564	3,317706
10:15	131	44,62613581	45,06454	50,60375	45,09081	38,18385	131	0,427083	568,1	32,227	0,034686	3,48942
10:20	136	45,00220844	45,36164	50,89705	45,34949	38,76008	136	0,430556	566,9	31,791	0,032664	3,655284
10:25	141	45,36966405	45,79285	51,06761	45,66308	39,3783	141	0,434028	610,6	31,765	0,035664	3,828126
10:30	146	45,41082716	46,30063	50,83434	45,64269	39,75546	146	0,4375	641,9	31,765	0,038736	4,017384
10:35	151	46,45492541	47,32681	51,98431	46,83216	40,54831	151	0,440972	600,6	31,535	0,036186	4,20312
10:40	156	47,65056445	48,71062	53,06604	48,07768	41,80797	156	0,444444	693,1	31,816	0,041514	4,394034
10:45	161	47,98808403	49,13955	53,20667	48,23653	42,52105	161	0,447917	656,9	32,381	0,043686	4,596648
10:50	166	47,81262966	49,14755	52,83939	47,81467	42,78383	166	0,451389	519,4	31,714	0,030936	4,76454
10:55	171	49,70517312	50,97113	55,01728	49,84004	44,2582	171	0,454861	476,9	32,639	0,032664	4,977126
11:00	176	50,27408462	51,56692	55,7165	50,15139	44,95436	176	0,458333	834,4	33,704	0,048414	5,16759
11:05	181	51,28251938	52,2057	57,14801	50,9845	45,71505	181	0,461806	638,1	33,835	0,032964	5,364054
11:10	186	52,17959741	53,16296	58,20773	51,60482	46,72624	186	0,465278	615,6	33,261	0,042936	5,574462
11:15	191	52,75567134	53,80876	59,03569	52,00911	47,22221	191	0,46875	741,9	34,097	0,044886	5,79582
11:20	196	52,35626656	53,74932	58,54734	51,09407	47,42739	196	0,472222	729,4	33,209	0,043014	6,016584
11:25	201	52,83319614	53,69788	59,78979	51,27853	47,43126	201	0,475694	723,1	32,51	0,043236	6,233448
11:30	206	54,26872356	55,08121	61,51447	52,42726	48,86444	206	0,479167	725,6	32,949	0,043614	6,451662
11:35	211	55,2758772	56,16107	62,8099	53,35772	49,66001	211	0,482639	746,9	33,339	0,044664	6,670776
11:40	216	55,50420838	56,43265	63,07613	53,55435	49,88214	216	0,486111	775,6	33,495	0,045714	6,89739
11:45	221	56,46668361	57,32768	64,15189	54,67152	50,57665	221	0,489583	301,9	33,757	0,011886	7,099248
11:50	226	57,15588025	57,74325	64,3453	55,73355	51,38879	226	0,493056	705,6	33,992	0,042264	7,290012
11:55	231	58,42010716	58,87756	65,56018	57,55624	52,14391	231	0,496528	730,6	34,677	0,043086	7,50252
12:00	236	58,75438663	59,43318	65,7981	57,84831	52,61675	236	0,5	505,6	34,942	0,037164	7,717356
12:05	241	58,65978918	58,92945	65,51077	57,94836	52,52024	241	0,503472	583,1	34,281	0,035814	7,889064
12:10	246	59,65429989	59,90567	66,19122	59,37387	53,39781	246	0,506944	449,4	31,026	0,036114	8,069328
12:11	247	59,7974626	60,01059	66,14939	59,61434	53,62866	247	0,507639	274,4	31,001	0,026964	8,096292
12:12	248	60,10840264	60,19419	66,45975	60,08491	53,78055	248	0,508333	274,4	30,976	0,016464	8,112756

Lampiran 11. Olah data tanggal 17 Desember 2016

Massa air	T awal	T akhir	T rata	ΔT	cp	Q sensibel air
(kg)	(°C)	(°C)	(°C)	(°C)	(kJ/kg.°C)	(kJ)
1	2	3	4	5	6	7
47,8392	28,68	60,19	58,78	31,51	4,1841	6307,4937

Massa paraffin	T awal	T akhir	cp,parafin padat	cp,parafin cair	Titik lebur	L	Q sens par. padat	Q sens par. cair	Q laten
(kg)	(°C)	(°C)	(kJ/kg.°C)	(kJ/kg.°C)	(°C)	(kJ/kg)	(kJ)	(kJ)	(kJ)
8	9	10	11	12	13	14	15	16	17
7,76	28,30	60,11	2	2	52	173	367,85	125,85	1342,56

Massa tembaga	cp tembaga	T awal	T akhir	Q sens tembaga	Q total
(kg)	(kJ/kg.°C)	(°C)	(°C)	(kJ)	(kJ)
18	19	20	21	22	23
11,45	0,38	28,49	60,15	138,01	8281,7638

Lampiran 12. Olah data tanggal 17 Desember 2016

Waktu		Massa air	Air sirkulasi					Air dalam TES					Perolehan kalor (Q collected)	
			emp. masuk TES	emp. keluar TE	Selisih temp.	Temp. rata2	Kalor jenis	Temp. awal	Temp. akhir	Selisih temp.	Temp. rata2	Kalor jenis	Sesaat	Kumulatif
Jam	Menit	(kg)	T1 (°C)	T2 (°C)	(°C)	(°C)	(kJ/kg.C)	(°C)	(°C)	(°C)	(°C)	(kJ/kg.C)	(kJ)	(kJ)
1	2	3	4	5	6 = 4-5	7 = (4+5)/2	8	9	10	11 = 10-9	12 = (9+10)/2	13	14 = 3x13x11	15
8:05	1	47,8392	28,3855508	28,1095924	0,2759584	28,2475716	4,179349354	28,68240956	28,68240956	0	28,68240956	4,179257177	0	0
8:06	2	47,8392	28,2103222	28,04198	0,1683422	28,1261511	4,17937628	28,68240956	28,77075268	0,088343119	28,72658112	4,179248182	17,6626066	17,66260663
8:11	7	47,8392	32,3278588	28,1821214	4,1457374	30,2549901	4,17897741	28,77075268	28,80364381	0,032891127	28,78719824	4,179235947	6,57596595	24,23857258
8:16	12	47,8392	37,7599576	28,0774698	9,6824878	32,9187137	4,178681507	28,80364381	29,67196769	0,868323881	29,23780575	4,179148935	173,601512	197,8400843
8:21	17	47,8392	39,7966866	28,083399	11,7132876	33,9400428	4,178622864	29,67196769	30,15081815	0,478850457	29,91139292	4,179031561	95,7325144	293,5725987
8:26	22	47,8392	41,1170438	27,871607	13,2454368	34,4943254	4,178603001	30,15081815	30,30197326	0,151155116	30,2263957	4,178981771	30,2188015	323,7914002
8:31	27	47,8392	42,6916246	28,4560236	14,235601	35,5738241	4,17858761	30,30197326	31,30518047	1,003207211	30,80357687	4,17889877	200,556344	524,3477444
8:36	32	47,8392	43,5943148	28,6141722	14,9801426	36,1042435	4,178591007	31,30518047	31,88138173	0,57620126	31,5932811	4,178802009	115,188708	639,5364524
8:41	37	47,8392	45,2412294	28,7717718	16,4694576	37,0065006	4,17861285	31,88138173	32,62163844	0,740256703	32,25151008	4,178735743	147,982774	787,5192267
8:46	42	47,8392	46,0513216	29,1246446	16,926677	37,5879831	4,178637382	32,62163844	33,42808349	0,80644505	33,02486096	4,178674054	161,211933	948,7311597
8:51	47	47,8392	46,1290356	29,1673812	16,9616544	37,6482084	4,178640382	33,42808349	33,83105961	0,402976124	33,62957155	4,178637632	80,5560078	1029,287167
8:56	52	47,8392	46,347684	29,029875	17,317809	37,6887795	4,178642452	33,83105961	34,12982615	0,298766543	33,98044288	4,178621136	59,7239973	1089,011165
9:01	57	47,8392	46,9778262	29,5238896	17,4539366	38,2508579	4,178675088	34,12982615	35,13193893	1,002112776	34,63088254	4,178599369	200,323197	1289,334361
9:06	62	47,8392	47,0253696	29,8946232	17,1307464	38,4599964	4,178689101	35,13193893	35,88322321	0,751284277	35,50758107	4,178587686	150,181946	1439,516308
9:11	67	47,8392	47,2857298	29,942923	17,3428068	38,6143264	4,178700085	35,88322321	36,28657514	0,403351939	36,08489918	4,178590759	80,6302296	1520,146537
9:16	72	47,8392	48,2621812	30,3573692	17,904812	39,3097752	4,178756278	36,28657514	36,90915856	0,622583414	36,59786685	4,178600483	124,454987	1644,601525
9:21	77	47,8392	49,8058594	30,8450154	18,960844	40,3254374	4,178857639	36,90915856	37,71404272	0,804884157	37,31160064	4,178624715	160,898004	1805,499529
9:26	82	47,8392	50,5765822	31,3746906	19,2018916	40,9756364	4,178934249	37,71404272	38,72658504	1,01254232	38,22031388	4,178673126	202,411644	2007,911173
9:31	87	47,8392	50,6320556	31,8962894	18,7357662	41,2641725	4,178971119	38,72658504	39,42741443	0,700829399	39,07699974	4,178736258	140,100983	2148,012155
9:36	92	47,8392	49,9096936	32,1316762	17,7780174	41,0206849	4,17893989	39,42741443	39,89298018	0,465565746	39,66019731	4,178788691	93,0712054	2241,083361
9:41	97	47,8392	49,1647494	32,5234304	16,641319	40,8440899	4,178918023	39,89298018	40,00911789	0,116137709	39,95104903	4,178817649	23,2172395	2264,3006
9:46	102	47,8392	48,9183704	32,8110576	16,1073128	40,864714	4,178920543	40,00911789	40,85086132	0,841743427	40,4299896	4,178869347	168,276099	2432,576699
9:51	107	47,8392	50,0933524	33,748164	16,3451884	41,9207582	4,179061494	40,85086132	41,40640945	0,555548136	41,12863538	4,178953582	111,063959	2543,640658
9:56	112	47,8392	51,3876626	34,3059114	17,0817512	42,846787	4,179203976	41,40640945	41,97325508	0,566845633	41,68983227	4,17902869	113,324566	2656,965225
10:01	117	47,8392	52,2796046	35,3505364	16,9290682	43,8150705	4,179371315	41,97325508	43,02472096	1,051465874	42,49898802	4,179148426	210,216541	2867,181766
10:06	122	47,8392	53,3219482	35,8331196	17,4888286	44,5775339	4,179515981	43,02472096	43,3229856	0,29826464	43,17385328	4,179258425	59,6327592	2926,814525
10:11	127	47,8392	54,4264996	36,5932162	17,8332834	45,5098579	4,179707975	43,3229856	44,55455901	1,231573411	43,9387723	4,179394021	246,239392	3173,053917
10:16	132	47,8392	55,4191282	37,5614204	17,8577078	46,4902743	4,179927417	44,55455901	45,07803486	0,523475854	44,81629694	4,17956358	104,667415	3277,721332
10:21	137	47,8392	55,0246778	37,5547958	17,469882	46,2897368	4,179881088	45,07803486	45,29613252	0,218097657	45,18708369	4,179639647	43,6087611	3321,330093
10:26	142	47,8392	56,5369288	38,7630594	17,7738694	47,6499941	4,180209688	45,29613252	46,1516192	0,85548668	45,72387586	4,179754357	171,059784	3492,389877
10:31	147	47,8392	56,8808102	38,2047874	18,6760228	47,5427988	4,18018258	46,1516192	46,28435411	0,132734906	46,21798665	4,179864691	26,5418553	3518,931733
10:36	152	47,8392	57,4148774	39,900014	17,5148634	48,6574457	4,180474432	46,28435411	47,59838277	1,314028664	46,94136844	4,180034318	262,765652	3781,697385
10:41	157	47,8392	59,7872162	41,3023674	18,4848488	50,5447918	4,181018063	47,59838277	49,12921826	1,53083549	48,36380052	4,180395413	306,146849	4087,844233
10:46	162	47,8392	59,2676182	41,5594824	17,7081358	50,4135503	4,180978282	49,12921826	49,00414288	-0,12507538	49,06668057	4,180587075	-25,0145683	4062,829665
10:51	167	47,8392	58,7355518	42,0174582	16,7180936	50,376505	4,180967105	49,00414288	49,4975908	0,493447916	49,25086684	4,180638726	98,6887996	4161,518464
10:56	172	47,8392	61,3621386	43,57014	17,7919986	52,4661393	4,181633662	49,4975908	51,13973909	1,642148293	50,31866494	4,180949703	328,451481	4489,969945
11:01	177	47,8392	62,6180554	44,4491378	18,1689176	53,5335966	4,182002159	51,13973909	51,76932088	0,629581786	51,45452998	4,181301833	125,935329	4615,905275
11:06	182	47,8392	62,2473218	44,4293738	17,817948	53,3383478	4,18193336	51,76932088	52,02945123	0,260130356	51,89938605	4,181445656	52,0356999	4667,940975
11:11	187	47,8392	64,9508784	46,3819228	18,5689556	55,6664006	4,182793958	52,02945123	53,50771088	1,478259653	52,76858106	4,181736166	295,727193	4963,668168
11:16	192	47,8392	65,9398836	46,7793134	19,1605702	56,3595985	4,183067045	53,50771088	54,06896241	0,561251524	53,78833665	4,182092857	112,288457	5075,956624
11:21	197	47,8392	65,5519724	46,9542004	18,597772	56,2530864	4,183024586	54,06896241	54,13114167	0,062179263	54,10005204	4,182205277	12,4404137	5088,397038
11:26	202	47,8392	65,1158346	46,6905096	18,425325	55,9031721	4,182886372	54,13114167	53,92633492	-0,204806747	54,0287383	4,182179418	-40,9761196	5047,420919

Waktu		Massa air	Air sirkulasi					Air dalam TES					Perolehan kalor (Q collected)	
			emp. masuk TES	emp. keluar TE	Selisih temp.	Temp. rata2	Kalor jenis	Temp. awal	Temp. akhir	Selisih temp.	Temp. rata2	Kalor jenis	Sesaat	Kumulatif
Jam	Menit	(kg)	T1 (°C)	T2 (°C)	(°C)	(°C)	(kJ/kg.C)	(°C)	(°C)	(°C)	(°C)	(kJ/kg.C)	(kJ)	(kJ)
1	2	3	4	5	6 = 4-5	7 = (4+5)/2	8	9	10	11 = 10-9	12 = (9+10)/2	13	14 = 3x13x11	15
11:31	207	47,8392	66,5131494	48,3509418	18,1622076	57,4320456	4,183504593	53,92633492	55,28080491	1,354469987	54,60356992	4,1823902	271,005337	5318,426255
11:36	212	47,8392	67,6488596	49,49873	18,1501296	58,5737948	4,18399039	55,28080491	56,45974021	1,178935297	55,87027256	4,182873478	235,911226	5554,337481
11:41	217	47,8392	68,2745122	49,741815	18,5326972	59,0081636	4,184180592	56,45974021	56,94251618	0,48277597	56,70112819	4,183204406	96,6136834	5650,951164
11:46	222	47,8392	64,274608	50,3028076	13,9718004	57,2887078	4,183445057	56,94251618	57,35714564	0,414629466	57,14983091	4,183387685	82,9797619	5733,930926
11:51	227	47,8392	68,2160498	50,9560444	17,2600054	59,5860471	4,184438221	57,35714564	57,88627356	0,52912792	57,6217096	4,183583869	105,899294	5839,830221
11:56	232	47,8392	69,2765348	51,9564078	17,320127	60,6164713	4,184910561	57,88627356	58,96411178	1,077838219	58,42519267	4,183926001	215,735434	6055,565654
12:01	237	47,8392	68,2833206	52,4728826	15,810438	60,3781016	4,184799819	58,96411178	59,47779482	0,513683034	59,2209533	4,184274848	102,825146	6158,3908
12:06	242	47,8392	67,3160802	52,2741934	15,0418868	59,7951368	4,184532724	59,47779482	59,44415132	-0,033643493	59,46097307	4,184382017	-6,73466989	6151,65613
12:11	247	47,8392	66,407717	53,0183934	13,3893236	59,7130552	4,184495544	59,44415132	60,01059305	0,566441727	59,72737219	4,184502021	113,392134	6265,048264

Waktu		Energi matahari yang terjadi (Q incident)				Efisiensi	Laju aliran massa thermosyphon			Instantaneous	Perolehan energi		
		Luas kolektor	Radiasi	Sesaat (kJ)	Kumulatif (kJ)	kumulatif	(kg/detik)	vol. spesifik	(lt/menit)	heat stored	Sesaat	Akumulasi	
		(m2)	(W/m2)	(kJ)	(kJ)	(%)		(m^3/kg)		(W)	(kW.detik)	(kW.detik)	(MJ)
		16	17	18 = 16x17xt	19	20 = 15/19	21 = (20/100)x16x 17/(6x8x1000)	22	23 = 21x22x1000 x60	24 = 21x6x8x1000	25 = 24xt/1000	26	27 = 26/1000
		1,9	189,4										
8:05	1	1,9	194,4	22,1616	22,1616	0	0	0,001003894	0	0	0	0	0
8:06	2	1,9	200,6	22,8684	45,03	39,2240876	0,212487265	0,001003859	12,7984374	149,4986874	8,969921242	8,969921242	0,008969921
8:11	7	1,9	228,1	26,0034	71,0334	34,1227825	0,008535943	0,00100449	0,51445598	147,8847271	8,873083624	17,84300487	0,017843005
8:16	12	1,9	251,9	28,7166	99,75	198,335924	0,023461562	0,001005336	1,41520474	949,2555664	56,95533399	74,79833885	0,074798339
8:21	17	1,9	271,9	30,9966	130,7466	224,535551	0,023699323	0,001005677	1,43003115	1159,97311	69,5983866	144,3967255	0,144396725
8:26	22	1,9	288,1	32,8434	163,59	197,928602	0,019575282	0,001005865	1,1814057	1083,441375	65,00648251	209,403208	0,209403208
8:31	27	1,9	406,9	46,3866	209,9766	249,717228	0,032455214	0,00100624	1,95946447	1930,588859	115,8353316	325,2385395	0,32523854
8:36	32	1,9	478,1	54,5034	264,48	241,809003	0,035091263	0,001006428	2,11900986	2196,568807	131,7941284	457,0326679	0,457032668
8:41	37	1,9	508,1	57,9234	322,4034	244,265174	0,034265172	0,001006753	2,06979371	2358,111565	141,4866939	598,5193618	0,598519362
8:46	42	1,9	475,6	54,2184	376,6218	251,905535	0,032183018	0,001006966	1,94443197	2276,319175	136,5791505	735,0985124	0,735098512
8:51	47	1,9	466,9	53,2266	429,8484	239,45353	0,029970605	0,001006988	1,81080248	2124,21621	127,4529726	862,551485	0,862551485
8:56	52	1,9	451,9	51,5166	481,365	226,233973	0,026842664	0,001007003	1,62183861	1942,467517	116,548051	979,099536	0,979099536
9:01	57	1,9	449,4	51,2316	532,5966	242,084602	0,028341435	0,001007212	1,71274991	2067,063586	124,0238151	1103,123351	1,103123351
9:06	62	1,9	449,4	51,2316	583,8282	246,565052	0,029410462	0,00100729	1,77749242	2105,320357	126,3192214	1229,442573	1,229442573
9:11	67	1,9	475,6	54,2184	638,0466	238,25008	0,029707624	0,001007348	1,79555563	2152,923026	129,1753816	1358,617954	1,358617954
9:16	72	1,9	516,9	58,9266	696,9732	235,963381	0,030973333	0,001007612	1,87254693	2317,419958	139,0451975	1497,663152	1,497663152
9:21	77	1,9	551,9	62,9166	759,8898	237,600179	0,03144456	0,001008005	1,90177648	2491,499242	149,4899545	1647,153106	1,647153106
9:26	82	1,9	530,6	60,4884	820,3782	244,754331	0,030749756	0,001008261	1,86022618	2467,46631	148,0479786	1795,201085	1,795201085
9:31	87	1,9	501,9	57,2166	877,5948	244,761267	0,029810733	0,001008375	1,80362418	2334,067922	140,0440753	1935,24516	1,93524516
9:36	92	1,9	453,1	51,6534	929,2482	241,171666	0,027946311	0,001008278	1,69065988	2076,222751	124,5733651	2059,818525	2,059818525
9:41	97	1,9	445,6	50,7984	980,0466	231,040095	0,028127721	0,001008209	1,70151672	1956,077864	117,3646719	2177,183197	2,177183197
9:46	102	1,9	444,4	50,6616	1030,7082	236,010221	0,029605422	0,001008217	1,79092106	1992,775901	119,566554	2296,749751	2,296749751
9:51	107	1,9	515,6	58,7784	1089,4866	233,471495	0,033483564	0,001008638	2,026368	2287,180158	137,2308095	2433,98056	2,43398056
9:56	112	1,9	521,9	59,4966	1148,9832	231,244915	0,032120857	0,001009015	1,9446251	2293,047702	137,5828621	2571,563423	2,571563423
10:01	117	1,9	515,6	58,7784	1207,7616	237,396334	0,032869758	0,001009416	1,99075474	2325,62945	139,537767	2711,10119	2,71110119
10:06	122	1,9	563,1	64,1934	1271,955	230,103622	0,033680294	0,001009736	2,04049281	2461,855641	147,7113385	2858,812528	2,858812528
10:11	127	1,9	576,9	65,7666	1337,7216	237,198376	0,034880974	0,001010134	2,11406816	2599,955124	155,9973075	3014,809836	3,014809836
10:16	132	1,9	551,9	62,9166	1400,6382	234,016274	0,032874988	0,00101056	1,99332886	2453,918054	147,2350832	3162,044919	3,162044919
10:21	137	1,9	563,1	64,1934	1464,8316	226,738015	0,03322076	0,001010472	2,01411959	2425,847349	145,5508409	3307,59576	3,30759576
10:26	142	1,9	623,1	71,0334	1535,865	227,389118	0,036232723	0,001011073	2,19803506	2692,037029	161,5222217	3469,117981	3,469117981
10:31	147	1,9	623,1	71,0334	1606,8984	218,989062	0,033208872	0,001011025	2,01449981	2592,589605	155,5553763	3624,673358	3,624673358
10:36	152	1,9	614,4	70,0416	1676,94	225,511788	0,035953546	0,001011526	2,18207708	2632,534413	157,9520648	3782,625423	3,782625423
10:41	157	1,9	714,4	81,4416	1758,3816	232,477651	0,040829899	0,001012395	2,48016013	3155,558639	189,3335183	3971,958941	3,971958941
10:46	162	1,9	566,9	64,6266	1823,0082	222,864037	0,032422709	0,001012334	1,96935687	2400,490826	144,0294496	4115,98839	4,11598839
10:51	167	1,9	733,1	83,5734	1906,5816	218,271196	0,043496043	0,001012317	2,64190661	3040,277664	182,4166599	4298,40505	4,29840505
10:56	172	1,9	770,6	87,8484	1994,43	225,125472	0,044303345	0,001013307	2,69357217	3296,152082	197,7691249	4496,174175	4,496174175
11:01	177	1,9	710,6	81,0084	2075,4384	222,406277	0,0395196	0,001013824	2,40395513	3002,796107	180,1677664	4676,341942	4,676341942
11:06	182	1,9	738,1	84,1434	2159,5818	216,150228	0,040680821	0,001013729	2,47435909	3031,269176	181,8761506	4858,218092	4,858218092
11:11	187	1,9	788,1	89,8434	2249,4252	220,663846	0,042541438	0,001014882	2,59047164	3304,198369	198,2519022	5056,469994	5,056469994
11:16	192	1,9	741,9	84,5766	2334,0018	217,478694	0,038248326	0,001015232	2,32985605	3065,601414	183,9360848	5240,406079	5,240406079
11:21	197	1,9	724,4	82,5816	2416,5834	210,561615	0,037252885	0,001015178	2,26909894	2898,085846	173,8851508	5414,29123	5,41429123
11:26	202	1,9	724,4	82,5816	2499,165	201,964293	0,036067448	0,001015001	2,1965099	2779,755741	166,7853444	5581,076574	5,581076574
11:31	207	1,9	721,9	82,2966	2581,4616	206,023838	0,037191118	0,001015781	2,26668191	2825,843559	169,5506136	5750,627188	5,750627188
11:36	212	1,9	755,6	86,1384	2667,6	208,21478	0,039362865	0,001016374	2,40044319	2989,214673	179,3528804	5929,980068	5,929980068
11:41	217	1,9	790,6	90,1284	2757,7284	204,91326	0,039694599	0,001016602	2,42121583	3078,084043	184,6850426	6114,665111	6,114665111
11:46	222	1,9	743,1	84,7134	2842,4418	201,725535	0,048727631	0,001015707	2,96958041	2848,142655	170,8885593	6285,55367	6,28555367
11:51	227	1,9	703,1	80,1534	2922,5952	199,816595	0,036959336	0,001016907	2,25505201	2669,329914	160,1597948	6445,713465	6,445713465
11:56	232	1,9	746,9	85,1466	3007,7418	201,332629	0,039417854	0,001017456	2,40635668	2857,131478	171,4278887	6617,141354	6,617141354
12:01	237	1,9	583,1	66,4734	3074,2152	200,323998	0,033543705	0,001017329	2,04749818	2219,369543	133,1621726	6750,303526	6,750303526
12:06	242	1,9	536,9	61,2066	3135,4218	196,198678	0,03179756	0,001017018	1,94032094	2001,442337	120,0865402	6870,390067	6,870390067
12:11	247	1,9	274,4	31,2816	3166,7034	197,841334	0,018409966	0,001016974	1,12334758	1031,465581	61,88793488	6932,278001	6,932278001

Lampiran 13. Temperatur PATS *discharging* tanggal 24 November 2016

						T PCM di kapsul						T air di dalam tangki							Temperatur permukaan tangki				
Waktu	Data ke-	T HTF dr kolektor	T HTF ke kolektor	T air dingin ke tangki	T air panas dr tangki	K3		K14		K24		Vert. atas	Vert. atas tengah	Hor. Kanan	Vert. tengah	Hor. Kiri	Vert. bawah-tengah	Vert. bawah	Bawah	Tengah	Atas	Kanan	Kiri
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22
14:46	5	50,32776	49,66725	31,59364	53,0059	54,83545	54,95711	54,3307	53,72217	52,51586	52,44258	54,00363	54,80761	54,00363	53,74905	53,64952	52,15996	51,55694	50,92118	54,00186	54,94693	54,4621	54,06492
14:51	10	50,83691	44,61351	37,12909	54,22657	54,67255	54,87448	54,03536	53,35708	52,27198	51,66946	53,40581	54,35317	53,50468	52,93388	52,83161	49,9295	47,95672	48,35868	53,27871	54,61468	53,84538	53,23826
14:56	15	46,98639	42,66807	30,50214	53,72336	54,11419	54,35329	53,05169	52,55287	50,91977	50,32121	52,51529	53,74849	52,12542	51,16986	50,91977	47,59547	44,99513	45,65588	51,99381	54,07628	53,09242	51,53349
15:01	20	44,68041	41,63646	29,4587	53,44604	53,75947	53,96452	52,48414	52,12834	48,20165	48,0007	52,31822	53,58751	50,86442	49,45228	49,08973	44,27725	42,75564	43,24704	50,86414	53,9755	52,67234	50,15963
15:06	25	42,6737	40,48015	29,3687	52,72062	53,28128	53,45265	52,21825	51,89862	44,74272	44,4107	51,74249	52,9788	49,40076	47,60251	47,05565	43,70053	40,70257	41,30805	49,28318	53,42683	51,66054	48,2645
15:11	30	41,1627	39,28754	29,38682	52,11642	52,51964	52,65829	51,49158	50,99743	42,55422	42,05113	51,44407	52,29303	47,82295	45,60249	45,08397	41,76668	39,23439	39,80964	47,78744	52,96415	50,73471	46,52458
15:16	35	39,49938	38,19253	29,39645	51,26772	52,31649	52,4558	50,33047	49,52132	40,70568	40,20805	50,67052	51,62846	46,05175	43,7636	43,13149	39,31787	37,98256	38,52675	46,15115	52,36318	49,776	44,82136
15:21	40	38,08782	37,0651	29,3742	50,54296	51,94008	51,90401	48,49769	47,48109	39,09058	38,63334	49,77569	50,73709	44,33533	41,94365	41,44756	38,09875	36,78402	37,29688	44,60281	51,56823	48,55092	43,20576
15:26	45	37,12107	36,34748	29,58596	49,66588	51,54606	51,29919	46,75196	45,5981	37,54645	37,37912	49,23662	49,9171	42,93905	40,62097	40,0844	37,20079	35,82464	36,37663	43,22065	50,79777	47,38549	41,898
15:31	50	36,10752	35,54763	29,49939	48,63335	50,68036	50,29476	44,95826	44,05755	36,32994	36,2735	48,20686	48,81808	41,61749	39,44421	38,93912	35,98567	34,92281	35,51377	41,89513	49,87209	46,20578	40,61129
15:36	55	35,55392	34,81519	29,40918	47,75764	49,66866	49,28612	43,15893	42,47636	35,38384	35,509	47,48127	47,8849	40,39131	38,36288	37,85387	35,40187	34,39495	34,95212	40,87002	49,17404	45,21907	39,69548
15:41	60	35,39405	34,36939	29,5359	46,71981	48,58635	48,20712	41,57273	41,10812	34,69737	34,82483	46,58677	46,67454	39,24264	37,39473	36,95382	35,18203	33,70335	34,33451	39,71702	48,13712	44,03367	38,65228
15:46	65	35,15433	33,84354	29,58222	45,82559	47,3172	47,08361	40,19079	39,8727	34,40607	34,4273	45,83517	45,74812	38,38022	36,67681	36,16173	34,60596	33,37265	33,8978	38,85157	47,31458	43,06369	37,82471
15:51	70	34,49143	32,85811	29,02254	44,32404	45,30522	45,29083	38,24112	37,96465	33,57872	33,53115	44,4086	44,21963	36,98254	35,50753	35,05987	34,18575	32,67956	33,17143	37,58872	45,99177	41,66158	36,70784
15:56	75	34,35881	32,76112	29,24881	43,24987	44,28286	44,30731	37,3572	37,15479	33,4036	33,28508	43,48651	43,26492	36,19922	34,96489	34,55117	33,10625	32,45536	32,94804	36,90005	45,09616	40,72485	36,09239
16:01	80	33,91746	32,39084	29,3082	42,07102	43,09453	43,15841	36,59313	36,40238	32,91806	32,90838	42,50501	42,1443	35,428	34,3385	34,03013	32,80107	31,91069	32,47689	35,99893	43,91871	39,57593	35,33659
16:06	85	33,32684	31,94278	29,18156	41,30808	41,75649	41,93148	35,82257	35,58925	32,42302	32,45073	41,44225	41,04919	34,75461	33,84554	33,6072	32,4865	31,6789	32,17436	35,3379	42,87241	38,70199	34,85605
16:11	90	33,10723	31,68714	29,24846	39,80921	40,53795	40,71707	35,24434	34,97709	32,13908	32,13193	40,41032	39,87796	34,1843	33,41979	33,21587	32,16772	31,27957	31,91965	34,76036	41,8374	37,76808	34,35167
16:16	95	32,89044	31,54175	29,3182	38,9693	39,42849	39,64697	34,74042	34,5462	31,90878	31,90238	39,39539	38,75909	33,63153	32,97584	32,8063	34,22721	31,15084	31,71982	34,2376	40,8207	36,96007	33,90196
16:21	100	32,28805	30,93878	28,8563	37,61763	37,78977	38,04949	33,81406	33,4797	31,36567	31,32522	38,21144	37,25757	32,80196	32,22018	32,04809	31,32522	30,6864	31,22124	33,41542	39,50628	35,74545	33,11803
16:26	105	32,2854	30,97194	29,03356	36,14344	36,85683	37,04841	33,45271	33,19098	31,29673	31,2565	37,17696	36,40424	32,51772	32,00833	31,87145	31,72198	30,60291	31,20967	33,00916	38,53292	35,12483	32,82033
16:31	110	31,70832	30,47389	28,71316	34,95479	35,6787	35,87427	32,73854	32,44322	30,71832	30,64412	35,81307	35,22268	31,83206	31,39627	31,29326	30,89489	30,12517	30,59039	32,245	37,13218	34,07494	32,13015
16:36	115	31,10366	29,93249	28,24135	33,76312	34,56402	34,72765	31,98079	31,72357	30,33548	30,29833	34,7507	34,19909	31,26988	30,90739	30,80275	30,29833	29,53727	30,00457	31,47836	35,79945	33,12984	31,36593
16:41	120	30,60227	29,53824	27,98939	32,81306	33,70353	33,9058	31,4062	31,18657	30,10484	30,03261	33,87536	33,75534	30,85973	30,53431	30,46436	30,14012	29,26505	29,76918	31,0628	34,8507	32,53529	30,9875
16:46	125	30,59198	29,67134	28,23109	32,61464	33,40625	33,57378	31,35995	31,06884	29,83354	29,79801	33,21013	33,05645	30,48073	30,22812	30,04929	29,72632	29,20569	29,67418	30,82383	34,25578	32,22475	30,82093
16:51	130	30,33052	29,48142	28,18438	32,02907	32,85736	33,0625	30,98997	30,77162	29,70323	29,66813	32,64761	32,53147	30,42052	30,13225	30,09694	29,70212	29,16036	29,70073	30,70667	33,71033	31,96407	30,70417
16:56	135	30,3393	29,5619	28,40921	31,84948	32,6867	32,85664	30,9269	30,70875	29,67889	29,64386	32,33799	32,40176	30,32614	30,00232	30,11042	29,67971	29,2317	29,73595	30,74198	33,38791	31,89162	30,77518

Lampiran 14. Olah data temperatur rata-rata *discharging* tanggal 24 November 2016

Waktu		T rata PCM	T rata air	K3 rata	K14 rata	K24 rata
5	14:46	53,80065	53,41862	54,89628	54,02644	52,47922
10	14:51	53,48015	52,13077	54,77351	53,69622	51,97072
15	14:56	52,55217	50,43849	54,23374	52,80228	50,62049
20	15:01	51,42314	48,90644	53,86199	52,30624	48,10118
25	15:06	50,0007	47,59762	53,36697	52,05843	44,57671
30	15:11	48,71205	46,17822	52,58897	51,2445	42,30267
35	15:16	47,58964	44,64946	52,38614	49,9259	40,45687
40	15:21	46,2578	43,30316	51,92204	47,98939	38,86196
45	15:26	45,02015	42,26051	51,42263	46,17503	37,46278
50	15:31	43,76573	41,13346	50,48756	44,50791	36,30172
55	15:36	42,58049	40,25301	49,47739	42,81765	35,44642
60	15:41	41,49942	39,39112	48,39673	41,34042	34,7611
65	15:46	40,54961	38,68295	47,20041	40,03175	34,41669
70	15:51	38,98528	37,57764	45,29802	38,10289	33,55494
75	15:56	38,29847	36,86119	44,29509	37,256	33,34434
80	16:01	37,51248	36,16539	43,12647	36,49776	32,91322
85	16:06	36,66226	35,55203	41,84399	35,70591	32,43688
90	16:11	35,95791	34,9365	40,62751	35,11072	32,13551
95	16:16	35,36221	34,7066	39,53773	34,64331	31,90558
100	16:21	34,30399	33,50726	37,91963	33,64688	31,34544
105	16:26	33,85036	33,18623	36,95262	33,32184	31,27662
110	16:31	33,0162	32,3682	35,77649	32,59088	30,68122
115	16:36	32,27164	31,68077	34,64584	31,85218	30,31691
120	16:41	31,72326	31,27061	33,80467	31,29638	30,06872
125	16:46	31,50673	30,85096	33,49001	31,21439	29,81578
130	16:51	31,17547	30,67018	32,95993	30,8808	29,68568
135	16:56	31,08362	30,58429	32,77167	30,81783	29,66138

Lampiran 15. Olah data tanggal 24 November 2016

Waktu		Massa air	Temperatur awal air	Temperatur akhir air	T rata-rata air	Kalor jenis air	Energi ekstraksi sesaat	Energi ekstraksi kumulatif
Jam	Menit ke-	(kg)	(°C)	(°C)	(°C)	(kJ/kg. °C)	(kW)	(kW)
1	2	3	4	5	6=(4+5)/2	7	8=3x7x(4-5)/t	9
14:46	0	47,83	53,4186	53,4186	53,4186	4,1820	0	0
14:51	5	47,83	53,4186	52,1308	52,7747	4,1817	15,4552	15,4552
14:56	10	47,83	52,1308	50,4385	51,2846	4,1812	20,3062	35,7615
15:01	15	47,83	50,4385	48,9064	49,6725	4,1808	18,3815	54,1429
15:06	20	47,83	48,9064	47,5976	48,2520	4,1804	15,7017	69,8446
15:11	25	47,83	47,5976	46,1782	46,8879	4,1800	17,0268	86,8714
15:16	30	47,83	46,1782	44,6495	45,4138	4,1797	18,3373	105,2087
15:21	35	47,83	44,6495	43,3032	43,9763	4,1794	16,1477	121,3563
15:26	40	47,83	43,3032	42,2605	42,7818	4,1792	12,5049	133,8612
15:31	45	47,83	42,2605	41,1335	41,6970	4,1790	13,5167	147,3779
15:36	50	47,83	41,1335	40,2530	40,6932	4,1789	10,5589	157,9369
15:41	55	47,83	40,2530	39,3911	39,8221	4,1788	10,3360	168,2729
15:46	60	47,83	39,3911	38,6830	39,0370	4,1787	8,4925	176,7654
15:51	65	47,83	38,6830	37,5776	38,1303	4,1787	13,2548	190,0202
15:56	70	47,83	37,5776	36,8612	37,2194	4,1786	8,5916	198,6117
16:01	75	47,83	36,8612	36,1654	36,5133	4,1786	8,3439	206,9556
16:06	80	47,83	36,1654	35,5520	35,8587	4,1786	7,3552	214,3108
16:11	85	47,83	35,5520	34,9365	35,2443	4,1786	7,3812	221,6920
16:16	90	47,83	34,9365	34,7066	34,8216	4,1786	2,7569	224,4490
16:21	95	47,83	34,7066	33,5073	34,1069	4,1786	14,3822	238,8312
16:26	100	47,83	33,5073	33,1862	33,3467	4,1787	3,8498	242,6810
16:31	105	47,83	33,1862	32,3682	32,7772	4,1787	9,8098	252,4908
16:36	110	47,83	32,3682	31,6808	32,0245	4,1788	8,2438	260,7345
16:41	115	47,83	31,6808	31,2706	31,4757	4,1788	4,9188	265,6534
16:46	120	47,83	31,2706	30,8510	31,0608	4,1789	5,0326	270,6860
16:51	125	47,83	30,8510	30,6702	30,7606	4,1789	2,1680	272,8540
16:56	130	47,83	30,6702	30,5843	30,6272	4,1789	1,0301	273,8841

Lampiran 16. Data Temperatur PATS *discharging* tanggal 25 November 2016

						T PCM di kapsul						T air di dalam tangki							Temperatur permukaan tangki				
Waktu	Data ke-	T HTF dr kolektor	T HTF ke kolektor	T air dingin ke tangki	T air panas dr tangki	K3		K14		K24		Vert. atas	Vert. atas-tengah	Hor. Kanan	Vert. tengah	Hor. Kiri	Vert. bawah-tengah	Vert. bawah	Bawah	Tengah	Atas	Kanan	Kiri
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22
13:28	5	61,72785	50,35432	36,73628	59,35699	60,87966	61,21279	54,85396	54,83576	50,66936	51,39601	62,24201	61,79892	55,45526	55,27737	54,73083	51,33412	50,50189	49,73449	56,07832	62,23065	59,00429	55,04133
13:33	10	60,53166	49,9639	35,40995	58,31693	59,71532	60,15178	54,4991	54,51519	50,40432	51,16532	60,64778	60,54862	55,33136	55,0115	54,57135	50,92246	50,55334	49,64416	55,95345	60,98627	58,66825	54,9864
13:38	15	60,20582	50,59112	35,40036	58,16552	59,9879	60,28367	55,86806	55,67598	51,00653	51,80537	60,51313	60,62164	56,39163	55,7571	55,1746	51,60439	50,82766	50,09283	56,4344	60,76567	58,8335	55,54048
13:43	20	60,4665	51,77232	36,23898	58,53073	60,74259	60,96946	57,40117	57,17894	51,70129	52,57369	60,46872	61,06901	57,3326	56,73686	56,04711	52,09421	51,62467	51,02431	57,36001	61,05889	59,47954	56,50623
13:48	25	57,46471	50,45339	34,00625	56,82007	58,79272	59,12105	56,08376	55,82154	51,21277	52,01243	59,34155	59,55945	56,56252	55,89323	55,31056	51,67046	50,9573	50,18605	56,35151	59,5621	58,15253	55,60382
13:53	30	55,08951	48,10348	31,44374	58,35179	58,67292	58,96563	55,99911	56,16194	51,40569	52,02912	59,08317	58,58911	55,45103	54,21125	53,66617	49,14757	47,48557	48,30049	55,74242	59,44481	57,4366	54,73894
13:58	35	50,2793	45,96999	32,72932	58,03824	58,34844	58,6404	54,89666	54,77219	50,53702	51,01519	58,71823	58,49632	54,08813	52,48849	51,91036	48,08646	45,41687	46,14502	54,30524	59,20276	56,66545	52,97603
14:03	40	47,12822	44,30212	32,76506	56,76024	57,64249	57,89744	53,26965	53,17516	46,92893	47,46297	57,54483	57,46753	51,85721	50,03515	49,53118	46,21664	43,19611	44,0869	52,15705	58,39373	55,18323	50,7378
14:08	45	44,98732	42,72601	32,60816	55,77806	56,49948	56,78717	52,97342	52,98446	44,30939	44,72586	56,95961	56,05457	49,98195	47,86733	47,25985	42,91269	41,61742	42,45213	50,28799	57,54929	53,69974	48,7948
14:13	50	43,50543	40,88616	32,07899	54,25201	54,60026	54,88357	51,92058	51,64388	42,66889	42,75799	55,88359	54,34818	48,13044	45,90057	45,38708	41,23253	40,24543	40,98645	48,40998	56,31156	51,96102	46,79977
14:18	55	42,04816	39,78248	32,0787	52,6133	53,25573	53,57141	50,89303	50,07928	40,6953	41,02522	54,41672	52,80511	46,33583	44,16883	43,45941	39,7133	38,88549	39,71033	46,75471	54,91025	50,48093	45,11655
14:23	60	40,39916	38,38049	31,67086	51,03603	52,60598	52,92018	48,89485	47,78855	39,13575	39,60172	52,9045	51,46322	44,67133	42,46094	41,9317	38,56363	37,65882	38,49518	45,01794	53,28773	48,88428	43,3883
14:28	65	39,42343	37,47475	31,47666	50,08493	52,20211	52,19592	46,92798	45,84947	38,07311	38,53463	51,70181	50,43975	43,28994	41,18018	40,65266	37,6301	36,69222	37,57329	43,67772	52,06001	47,64938	42,14714
14:33	70	38,50061	36,47934	31,08491	48,85646	50,96565	50,77876	44,83428	43,81883	36,97411	37,43103	50,63618	49,06107	41,58723	39,71971	39,22981	36,47948	35,94543	36,65538	42,19924	50,69683	46,24274	40,73334
14:38	75	37,42781	35,29793	30,54244	46,84902	49,18946	48,89127	42,33924	41,70729	35,82269	36,31057	49,2781	47,34583	40,00907	38,1345	37,75389	35,31176	34,87968	35,56389	40,58275	49,15775	44,51717	39,1059
14:43	80	36,96155	35,15247	30,8633	46,0453	48,15772	48,03476	41,018	40,5243	35,41356	35,86398	48,36319	46,4053	39,13693	37,47315	37,09348	34,96909	34,45954	35,25466	39,84977	48,35823	43,67731	38,51144
14:48	85	35,67445	33,68503	29,89028	44,39582	45,66853	45,68181	38,41068	38,15842	34,45991	34,83475	46,78115	44,67231	37,68396	36,01386	35,70778	33,64046	33,50551	34,20248	38,34193	46,6821	41,95541	37,06663
14:53	90	35,13957	33,25667	29,78314	43,04123	44,21087	44,29192	37,19663	37,0119	34,0654	34,47438	45,81011	43,5673	36,86117	35,40248	35,09731	33,38495	33,14007	33,80473	37,52005	45,61735	40,88408	36,34738
14:58	95	34,64735	32,83536	29,79108	41,85771	42,93708	43,01507	36,31067	36,01525	33,49434	33,90092	44,63245	42,42773	35,78987	34,86442	34,52424	32,80574	32,66077	33,43701	36,72771	44,51097	39,8776	35,69366
15:03	100	34,18951	32,69896	29,83376	40,7643	41,80363	41,8789	35,70924	35,44764	32,77662	33,35934	43,3463	40,96288	35,1071	33,96384	33,80402	32,40349	32,23749	32,98196	35,91922	43,35278	38,8547	35,0596
15:08	105	33,82978	32,33886	29,79549	39,67705	40,44635	40,66138	35,02699	34,65525	32,54451	33,12627	42,35785	39,73257	34,51741	33,6588	33,49945	32,13191	31,92932	32,74813	35,29513	42,23605	37,87371	34,50378
15:13	110	33,15503	31,84239	29,4764	38,24982	38,91625	39,23511	34,20808	33,94127	31,99742	32,57694	41,16666	38,61474	33,75511	33,03714	32,9146	31,68575	31,38591	32,20979	34,43874	40,88746	36,69531	33,7145
15:18	115	32,6663	31,49643	29,41657	36,94771	37,67797	38,02987	33,68283	33,3423	31,67696	32,21933	40,0562	38,50855	33,29112	32,67912	32,59299	31,47695	31,04246	31,83381	33,81497	39,62801	35,78521	33,23072
15:23	120	31,85045	30,60825	28,66818	35,60621	35,96879	36,24519	32,50727	32,23457	31,07758	31,50987	38,67352	36,01536	32,44035	31,86117	31,81221	30,60813	30,47971	31,2048	32,97459	38,15189	34,62207	32,3861
15:28	125	31,70401	30,64082	28,84485	34,69199	35,2498	35,45282	32,18127	31,94342	30,93745	31,4409	37,80658	35,58897	32,2284	31,72029	31,67156	30,75585	30,53031	31,21916	32,81072	37,34925	34,20792	32,25723
15:33	130	31,27022	30,24253	28,62475	33,87585	34,35051	34,51554	31,63906	31,39935	30,41589	30,91719	36,91571	34,38681	31,67011	31,16001	31,1122	30,11833	30,03066	30,7957	32,24618	36,21767	33,46351	31,68983
15:38	135	31,19297	30,41608	28,90702	33,51396	34,16578	34,29448	31,70518	31,42969	30,43622	30,9735	36,37835	33,94175	31,54726	31,18045	31,1326	30,97227	30,06233	30,89862	32,17048	35,75101	33,3162	31,68543
15:43	140	30,93344	30,29974	28,86216	33,05783	33,65537	33,81878	31,44518	31,16879	30,23939	30,66816	35,62907	33,60127	31,35005	31,01849	30,93503	31,09878	30,07114	30,8358	32,0009	34,97705	33,00327	31,58668
15:48	145	30,59254	30,42458	29,23939	32,53697	33,52936	33,69248	31,82131	31,54623	30,36148	30,89844	34,6326	33,43706	31,68722	31,39277	31,30869	30,38931	30,18595	30,80645	32,2305	33,96038	32,84025	31,74576
15:53	150	30,34694	30,39394	28,3809	32,72696	33,35538	33,51809	31,57539	31,33546	30,37545	30,98425	34,50674	33,30777	31,59379	31,22716	31,14336	30,6571	30,026	30,86262	32,06331	33,82901	32,92284	31,61356
15:58	155	30,25258	30,1204	28,53807	32,26326	33,08174	33,24382	31,33736	30,98858	30,13129	30,66731	34,40803	33,0989	31,27758	30,90983	30,86242	29,97474	29,88298	30,64939	31,88643	33,68796	32,74553	31,47164
16:03	160	29,84559	29,64164	28,63325	31,85935	32,56703	32,76386	30,82212	30,5796	29,521	30,12635	33,88242	32,63063	30,80948	30,58391	30,42937	30,37096	29,36694	30,13816	31,30555	33,03655	32,09169	30,88792
16:08	165	29,47909	29,23923	27,86915	30,74161	32,20037	32,3604	30,491	30,2113	29,30548	29,8022	33,39297	32,19955	30,3069	30,0077	29,96177	29,1375	28,81713	29,62928	30,65559	32,28043	31,44008	30,1989
16:13	170	29,56991	29,29421	27,96039	30,76701	32,1119	32,23577	30,36652	30,15846	29,30036	29,83297	33,45777	32,05101	30,23009	29,93063	29,92072	29,1323	29,02344	29,90526	30,93069	32,55522	31,68011	30,51122
16:18	175	29,47213	29,12468	28,04222	30,62135	31,83469	32,02981	30,16083	29,91604	29,13869	29,63471	33,26512	31,74551	30,0681	29,76808	29,75845	28,96839	29,16561	29,90291	30,85699	32,44595	31,57044	30,47301
16:23	180	29,34734	29,07159	28,20496	30,85629	31,60216	31,72482	29,92809	29,68248	28,90312	29,47002	33,10508	31,58109	29,83204	29,60317	29,5579	28,87464	29,07738	29,81551	30,66279	32,3589	31,33995	30,27785
16:28	185	29,30685	29,03108	28,2723	30,32449	31,31042	31,50434	29,74384	29,46155	28,79762	29,47188	33,00215	31,29598	29,72634	29,53308	29,48793	29,16667	29,04688	29,85689	30,59696	32,18622	31,27396	30,21172
16:33	190	29,11587	28,76832	28,11656	30,26306	30,93977	31,13283	29,44471	29,19743	28,60522	29,20684	32,67476	30,99546	29,46184	29,2677	29,2589	28,64521	28,76809	29,5807	30,2145	31,76851	30,81892	29,82738
16:38	195	29,07209	28,72453	28,14463	29,83719	30,75233	30,90899	29,36492	29,04526	28,65356	29,14757	32,40761	30,72096	29,40268	29,24433	29,16372	28,6942	28,77231	29,58488	30,14726	31,63003	30,78729	29,86744
16:43	200	28,97754	28,70171	28,0857	29,71382	30,44221	30,67013	29,16238	28,87807	28,48576	29,05096	32,24384	30,55269	29,23454	29,07563	29,06714	28,52411	28,79249	29,56907	30,1315	31,43593	30,66409	29,77985
16:48	205	28,94026	28,59266	28,01228	29,31293	30,22532	30,41674	29,01719	28,73239	28,38397	28,87686	32,00475	30,34292	29,09666	28,93729	28,92903	28,42092	28,57467	29,3891	29,88062	31,11393	30,37115	29,55804
16:53	210	28,78702	28,61877	27,85842	29,28826	30	30,22691	28,89958	28,61435	28,35608	28,84887	31,83777	30,20724	29,10458	28,94523	28,97289	31,36498	28,61646	29,4305	29,85049	31,01245	30,3107	29,53335
16:58	215	28,58057	28,34053	27,65117	28,7242	29,68546	29,83963	28,6208	28,33462	28,1492	28,67708	31,56591	29,89204	28,82551	28,70123	28,65743	28,54578	28,26481	29,04631	29,5388	30,55826	29,92653	29,14837
17:03	220	28,57452	28,33448	27,71712	28,6464	29,53567	29,76152	28,57879	28,25637	28,14129	28,6332	31,48831	29,77638	28,78172	28,62129	28,6495	28,57405	28,22254	29,04025	29,4256	30,44515	29,77721	29,10642
17:08	225	28,49203	28,25198	27,67035	28,39993	29,3093	29,49861	28,42421	28,17343	28,09573	28,55149	31,37391	29,587	28,66429	28,57548	28,56782	27,94726	28,11878	28,90163	29,28736	30,1999	29,56692	28,89571
17:13	230	28,53817	28,26224	27,68065	28,47867	29,2477	29,47289	28,39854	28,11159	27,93253	28,45951	31,17962	29,45921	28,53661	28,44737	28,47588	28,79785	28,16196	28,98024	29,40147	30,20685	29,64553	29,04627
17:18	235	28,22361	27,98351	27,29281	28,1362	28,93257	29,12101	28,08328	27,83132	27,90372	28,35867	31,0466	29,21476	28,43596	28,31039	28,37506	28,65983	27,78065	28,63833	28,98905	29,83037	29,19607	28,59593
17:23	240	28,21524	27,90333	27,21234	27,87993	28,81631	28,96845	28,03892	27,7868	27,66754	28,12151	30,78102	29,08557	28,19924	28,1089	28,06607	27,68145	27,63088	28,38245	28,7696	29,57533	29,01183	28,41133
17:28	245	28,09317	27,81713	27,16185	27,7164	28,62211	28,77379	27,8806	27,62794	27,65919	28,07717	30,70294	28,96941	28,22677	28,10051	28,1296	27,46837	27,46608	28,25502	28,64252	29,44832	28,88439	28,28364
17:33	250	27,95849	27,68242	27,06268	27,57849	28,45121	28,63855	27,67367	27,49249	27,45601	27,90911	30,50453	28,69367	27,98724	27,86018	27,88967	27,335	27,25473	28,08149	28,50521	29,20393	28,67497	28,07382
17:38	255	27,95429	27,67822	27,16655	27,91913	28,447	28,56223	27,70543	27,48264	27,43224	27,88525	30,48132	28,77765	27,99932	27,94433	27,93773	27,27459	27,49892	28,35923	28,7107	29,40003	28,87177	28,30691
17:43	260	27,84804	27,50014	27,09593	27,59899	28,26861	28,38343	27,52698	27,3092	27,41551	27,90439	30,43	28,58115	27,94664	27,85547	27,84902	27,25762	27,38393	28,06612	28,38265	29,08142	28,55205	28,02249
17:48	265	27,70957	27,43344	27,029	27,71349	28,23777	28,31646	27,49613	27,31436	27,39546	27,81234	30,41043	28,56105	27,96246	27,87134	27,90081	27,30993	27,64403	28,25212	28,56815	29,26683	28,73811	28,2089
17:53	270	27,86565	27,62547	27,29375	27,79591	28,35819	28,47321	27,72265	27,46945	27,4154	27,9043	30,42989	28,61698	28,01833	27,92739	27,99272	27,29382	27,76136	28,51171	28,79131	29,38271	28,89209	28,435
17:58	275	27,84747	27,60727	27,09535	27,78801	28,33996	28,4189	27,67032	27,41693	27,40888	27,89773	30,31858	28,61043	28,01179	27,95685	27,98617	27,39614	27,50208	28,25484	28,53512	29,16236	28,70497	28,31936
17:59	280	27,84886	27,64458	27,16882	27,83414	28,3054	28,45635	27,67171	27,49053	27,4112	27,86412	30,32086	28,50496	27,97824	27,88717	27,91661	27,32588	27,58474	28,37257	28,61679	29,20828	28,82273	28,40143

Lampiran 17. Olah data temperatur rata-rata *discharging* tanggal 25 November 20016

Waktu		T rata PCM	T rata air	K3 rata	K14 rata	K24 rata
5	13:28	55,64126	55,9058	61,04623	58,03338	54,84486
10	13:33	55,07517	55,3695	59,93355	57,32544	54,50714
15	13:38	55,77125	55,8415	60,13579	58,07587	55,77202
20	13:43	56,76119	56,4819	60,85602	59,18531	57,29005
25	13:48	55,50738	55,6136	58,95689	57,60241	55,95265
30	13:53	55,53907	53,9477	58,81928	57,48237	56,08052
35	13:58	54,70165	52,7435	58,49442	56,76853	54,83442
40	14:03	52,72944	50,8355	57,76997	55,58355	53,22241
45	14:08	51,37996	48,9505	56,64332	54,88029	52,97894
50	14:13	49,74586	47,304	54,74191	53,40208	51,78223
55	14:18	48,25333	45,6835	53,41357	52,23222	50,48616
60	14:23	46,8245	44,2363	52,76308	50,90751	48,3417
65	14:28	45,63054	43,0838	52,19902	49,56195	46,38872
70	14:33	44,13378	41,8084	50,8722	47,80652	44,32656
75	14:38	42,37675	40,3875	49,04037	45,61525	42,02326
80	14:43	41,50206	39,7001	48,09624	44,52638	40,77115
85	14:48	39,53568	38,2864	45,67517	42,04625	38,28455
90	14:53	38,54185	37,6091	44,2514	40,74428	37,10427
95	14:58	37,61222	36,815	42,97607	39,66287	36,16296
100	15:03	36,82923	35,975	41,84126	38,79407	35,57844
105	15:08	36,07679	35,4039	40,55387	37,84419	34,84112
110	15:13	35,14585	34,6514	39,07568	36,7216	34,07468
115	15:18	34,43821	34,2353	37,85392	35,85635	33,51257
120	15:23	33,25721	33,1272	36,10699	34,37623	32,37092
125	15:28	32,86761	32,9003	35,35131	33,81704	32,06235
130	15:33	32,20626	32,1991	34,43302	33,0773	31,5192
135	15:38	32,16748	32,1736	34,23013	32,99983	31,56743
140	15:43	31,83261	31,9577	33,73707	32,63198	31,30699
145	15:48	31,97488	31,8619	33,61092	32,7569	31,68377
150	15:53	31,85734	31,7803	33,43673	32,54674	31,45543
155	15:58	31,57502	31,4878	33,16278	32,29059	31,16297
160	16:03	31,06333	31,1534	32,66544	31,79299	30,70086
165	16:08	30,72846	30,5462	32,28039	31,4257	30,35115
170	16:13	30,66766	30,5351	32,17384	31,30114	30,26249
175	16:18	30,45246	30,3913	31,93225	31,09532	30,03844
180	16:23	30,21845	30,233	31,66349	30,82645	29,80528
185	16:28	30,04827	30,1799	31,40738	30,62409	29,60269
190	16:33	29,75447	29,8674	31,0363	30,28877	29,32107
195	16:38	29,64544	29,7723	30,83066	30,13695	29,20509
200	16:43	29,44825	29,6415	30,55617	29,91625	29,02022
205	16:48	29,27541	29,4723	30,32103	29,71697	28,87479
210	16:53	29,15763	29,8642	30,11345	29,56324	28,75697
215	16:58	28,88446	29,2075	29,76254	29,23021	28,47771
220	17:03	28,8178	29,1591	29,64859	29,17015	28,41758
225	17:08	28,67546	28,9764	29,40396	28,96141	28,29882
230	17:13	28,60379	29,0084	29,36029	28,93572	28,25506
235	17:18	28,37176	28,8319	29,02679	28,60214	27,9573
240	17:23	28,23325	28,5076	28,89238	28,50369	27,91286
245	17:28	28,1068	28,4377	28,69795	28,32719	27,75427
250	17:33	27,93684	28,2179	28,54488	28,15611	27,58308
255	17:38	27,91913	28,2734	28,50462	28,13383	27,59404
260	17:43	27,80136	28,1863	28,32602	27,95521	27,41809
265	17:48	27,76209	28,2372	28,27711	27,90629	27,40524
270	17:53	27,89053	28,2915	28,4157	28,09793	27,59605
275	17:58	27,85879	28,2546	28,37943	28,04461	27,54363
280	17:59	27,86655	28,2169	28,38088	28,06403	27,58112

Lampiran 18. Olah data tanggal 25 November 2016

Waktu		Massa air	Temperatur awal air	Temperatur akhir air	T rata-rata air	Kalor jenis air	Energi ekstraksi sesaat	Energi ekstraksi kumulatif
Jam	Menit ke-	(kg)	(°C)	(°C)	(°C)	(kJ/kg. °C)	(kW)	(kW)
1	2	3	4	5	6=(4+5)/2	7	8=3x7x(4-5)/t	9
13:48	0	47,83	56,4819	55,6136	56,0477	4,1829	10,4233	10,4233
13:53	5	47,83	55,6136	53,9477	54,7806	4,1825	19,9953	30,4186
13:58	10	47,83	53,9477	52,7435	53,3456	4,1819	14,4513	44,8699
14:03	15	47,83	52,7435	50,8355	51,7895	4,1814	22,8960	67,7659
14:08	20	47,83	50,8355	48,9505	49,8930	4,1808	22,6168	90,3827
14:13	25	47,83	48,9505	47,3040	48,1272	4,1803	19,7528	110,1355
14:18	30	47,83	47,3040	45,6835	46,4938	4,1799	19,4381	129,5737
14:23	35	47,83	45,6835	44,2363	44,9599	4,1796	17,3589	146,9325
14:28	40	47,83	44,2363	43,0838	43,6601	4,1793	13,8229	160,7555
14:33	45	47,83	43,0838	41,8084	42,4461	4,1791	15,2962	176,0516
14:38	50	47,83	41,8084	40,3875	41,0980	4,1789	17,0401	193,0917
14:43	55	47,83	40,3875	39,7001	40,0438	4,1788	8,2442	201,3359
14:48	60	47,83	39,7001	38,2864	38,9933	4,1787	16,9528	218,2887
14:53	65	47,83	38,2864	37,6091	37,9477	4,1787	8,1231	226,4118
14:58	70	47,83	37,6091	36,8150	37,2120	4,1786	9,5218	235,9335
15:03	75	47,83	36,8150	35,9750	36,3950	4,1786	10,0732	246,0068
15:08	80	47,83	35,9750	35,4039	35,6895	4,1786	6,8487	252,8554
15:13	85	47,83	35,4039	34,6514	35,0277	4,1786	9,0236	261,8791
15:18	90	47,83	34,6514	34,2353	34,4434	4,1786	4,9894	266,8685
15:23	95	47,83	34,2353	33,1272	33,6813	4,1786	13,2886	280,1571
15:28	100	47,83	33,1272	32,9003	33,0137	4,1787	2,7213	282,8784
15:33	105	47,83	32,9003	32,1991	32,5497	4,1787	8,4083	291,2867
15:38	110	47,83	32,1991	32,1736	32,1863	4,1787	0,3063	291,5931
15:43	115	47,83	32,1736	31,9577	32,0656	4,1788	2,5889	294,1820
15:48	120	47,83	31,9577	31,8619	31,9098	4,1788	1,1482	295,3302
15:53	125	47,83	31,8619	31,7803	31,8211	4,1788	0,9794	296,3096
15:58	130	47,83	31,7803	31,4878	31,6340	4,1788	3,5077	299,8173
16:03	135	47,83	31,4878	31,1534	31,3206	4,1788	4,0102	303,8275
16:08	140	47,83	31,1534	30,5462	30,8498	4,1789	7,2815	311,1090
16:13	145	47,83	30,5462	30,5351	30,5407	4,1789	0,1329	311,2419
16:18	150	47,83	30,5351	30,3913	30,4632	4,1789	1,7247	312,9666
16:23	155	47,83	30,3913	30,2330	30,3122	4,1790	1,8982	314,8648
16:28	160	47,83	30,2330	30,1799	30,2065	4,1790	0,6378	315,5026
16:33	165	47,83	30,1799	29,8674	30,0236	4,1790	3,7471	319,2497
16:38	170	47,83	29,8674	29,7723	29,8198	4,1790	1,1413	320,3910
16:43	175	47,83	29,7723	29,6415	29,7069	4,1791	1,5683	321,9593
16:48	180	47,83	29,6415	29,4723	29,5569	4,1791	2,0289	323,9882

Lampiran 19.. Data Temperatur PATS *discharging* tanggal 17 Desember 2016

						T PCM di kapsul						T air di dalam tangki							Temperatur permukaan tangki				
Waktu	Data ke-	T HTF dr kolektor	T HTF ke kolektor	T air dingin ke tangki	T air panas dr tangki	K3		K14		K24		Vert. atas	Vert. atas-tengah	Hor. Kanan	Vert. tengah	Hor. Kiri	Vert. bawah-tengah	Vert. bawah	Bawah	Tengah	Atas	Kanan	Kiri
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22
12:13	5	64,80027	53,55313	41,79388	65,24989	66,42119	66,69662	60,37845	60,37866	52,62572	55,09271	66,84355	66,59633	60,36752	59,88866	59,19486	55,31555	53,80536	52,93947	61,01456	67,1147	66,64405	59,68719
12:18	10	59,75001	52,64229	54,16841	64,87207	65,02288	65,25982	59,75126	59,50179	53,22471	55,3402	65,54483	65,50806	59,76978	58,54729	57,89049	54,67359	53,42213	53,01797	59,86676	65,97085	65,15433	58,49782
12:23	15	56,05241	52,21774	48,77761	62,79124	63,22865	63,5319	57,98722	57,80244	52,97761	54,84492	64,48397	64,52384	58,00951	56,74465	56,1255	54,38755	53,05565	52,54886	57,92831	64,59825	63,66566	56,58386
12:28	20	54,43255	51,79604	40,05369	62,15218	62,21026	62,54644	56,82468	56,70676	51,25302	54,56445	63,73332	62,83859	56,95511	55,93361	55,56279	53,31894	51,48231	52,04796	57,32501	64,13706	62,44307	56,01251
12:33	25	54,24167	51,14534	40,93172	62,23951	62,37185	62,56725	57,02205	57,01108	50,50345	54,59085	64,10114	62,6538	56,94618	55,92465	55,55385	52,48837	50,68032	51,46518	57,41225	64,43362	62,5247	56,20605
12:38	30	52,78883	49,5482	40,46201	60,62002	60,85197	61,0791	56,02768	55,8716	48,62496	52,17771	62,62146	60,7455	55,49325	54,21824	53,84994	50,44288	49,22677	49,95465	56,01622	63,25303	61,08901	54,79128
12:43	35	51,18129	47,86658	39,65849	58,77275	59,03665	59,36555	55,69216	55,21582	47,46246	50,58739	61,32273	58,8815	54,50895	52,98196	52,65086	49,58761	47,73408	48,33448	54,33576	61,43965	59,21671	53,07742
12:48	40	49,39308	46,25194	38,53062	56,20219	56,86416	57,22349	54,61209	54,30928	45,87291	48,10687	58,71729	56,97848	52,42754	50,85634	50,49296	47,29722	45,87708	46,31767	52,12027	59,02316	57,20465	50,88513
12:53	45	48,74032	45,27859	37,94267	54,65241	55,82415	56,18112	54,06606	53,61935	44,62429	46,78337	57,47136	55,59168	51,25141	49,5332	49,17174	46,06821	44,42949	44,81249	50,74873	56,99068	55,97254	49,25814
12:58	50	48,02467	44,52588	38,114	54,57608	55,03918	55,74865	53,4219	52,86636	43,89994	45,84355	56,45914	54,90444	50,56351	48,77128	48,34	46,26713	44,51425	45,03823	50,74296	56,87966	55,51155	49,3586
13:03	55	46,79616	43,43671	37,05248	52,6643	54,83864	55,33512	52,40716	51,63471	42,65632	44,48918	55,01142	53,66394	49,00319	47,2397	46,73956	44,00286	42,57579	43,1886	48,58716	54,66159	54,74842	47,29717
13:08	60	46,17546	42,67251	37,71412	52,61628	54,29026	54,64376	51,1142	50,19461	42,68251	44,30203	55,31207	53,5486	48,63988	46,83923	46,41067	43,92165	42,81357	43,28229	48,64502	54,61382	54,72956	47,10708
13:13	65	45,7879	42,71059	39,00392	52,15522	54,15132	54,43359	50,26621	49,45006	42,25174	43,47832	54,722	52,72977	47,4656	45,80216	45,44615	43,59301	42,70427	43,24493	48,04346	54,29567	54,35651	46,57308
13:18	70	45,13683	42,09378	37,73984	51,22383	53,28975	53,60551	48,55132	48,15603	41,46526	43,0094	53,75216	51,87427	46,396	44,83479	44,44462	42,76035	41,72435	42,41606	46,65425	53,33389	53,57934	45,3891
13:23	75	44,14286	40,45735	47,08337	50,06266	52,01515	52,328	46,77595	46,73081	39,93	42,00328	52,50339	50,69677	45,32292	43,86404	43,58201	41,4569	40,15276	40,82359	45,56487	52,21383	52,30707	44,4714
13:28	80	43,99965	40,1002	34,22885	49,79429	51,73062	52,04282	46,49055	46,37316	39,51486	41,62246	52,72089	50,53069	45,33398	43,83953	43,4152	41,10837	39,84476	40,55398	45,54416	51,98204	52,17124	44,30844
13:33	85	43,79868	39,86312	41,78745	49,61049	51,35301	51,48678	46,1473	45,81478	38,85681	40,85542	52,35835	50,93735	44,60566	43,14379	42,57804	40,15391	39,58663	40,36935	45,32522	51,86958	51,59475	43,83953
13:38	90	42,34855	38,08844	40,90188	47,94497	49,44525	49,61003	44,16251	43,89443	37,34945	39,2719	50,62065	48,30026	42,81566	41,31058	40,99674	38,69904	37,86167	38,58937	43,30769	50,14225	49,57657	41,91737
13:43	95	40,89214	36,69928	38,97471	45,85042	47,60138	47,83299	42,1703	42,18128	36,31559	37,87756	48,75463	46,66566	41,17806	39,8447	39,46165	37,47149	36,20487	36,87678	41,25032	48,16438	47,99816	40,02666
13:48	100	40,07003	36,01764	38,57792	44,86935	46,49661	46,79688	40,95492	41,03343	35,15162	36,81683	47,59066	45,57563	39,87233	38,64086	38,25953	36,50887	35,6778	36,39025	40,44734	47,15316	46,72446	39,14798
13:53	105	39,49732	35,62193	38,61064	44,10145	45,67606	46,04574	40,20295	40,33559	34,63769	36,2654	46,67696	44,52966	39,0024	37,94625	37,70877	36,0605	35,29524	35,93994	39,6092	46,21266	45,79868	38,48355
13:58	110	38,40027	34,62919	39,18988	42,76143	44,08264	44,48444	38,88981	38,96162	34,24916	35,80403	45,74622	43,43044	38,04366	37,0911	36,9264	35,52255	34,58528	35,34356	38,58982	45,09163	44,64129	37,60142
14:03	115	38,07333	34,40862	40,1483	41,80956	43,2577	43,65768	38,41941	38,48969	33,86167	35,30786	44,88527	42,26035	37,15678	36,37983	36,14474	34,87718	34,12521	34,8521	37,78102	44,07404	43,29121	36,82403
14:08	120	37,67574	34,19981	40,79664	40,85583	42,26596	42,66374	37,92494	37,95777	33,82001	35,12291	44,18667	41,43505	36,75832	35,97988	35,81691	34,76271	34,16793	34,82307	37,43243	43,33766	42,85148	36,50929
14:13	125	38,2784	35,18576	44,38373	39,73946	42,71471	43,14919	39,01764	39,19731	33,66692	34,8261	43,55277	40,39095	36,24823	35,53952	35,44878	34,60762	33,90266	34,63163	36,95752	42,43976	42,62655	36,06761
14:18	130	36,9109	34,10134	43,08844	38,21417	41,27669	41,81522	38,25519	38,46825	33,05557	34,21249	42,19556	39,06617	35,31491	34,74614	34,64172	33,86467	33,22477	33,78154	35,82639	40,88746	41,09313	34,96629
14:23	135	34,8888	31,71738	41,10357	36,72616	37,14792	37,64195	34,22626	34,1392	32,21707	33,22757	40,37329	37,47746	34,26105	33,65259	33,63652	33,03019	32,36947	32,96983	34,66194	39,33671	37,67941	33,90308
14:28	140	35,00498	32,15594	30,6903	35,99917	37,01394	37,47186	34,34274	34,292	31,94185	33,05883	39,51477	36,84468	33,94973	33,44778	33,43204	32,60661	32,13971	32,81364	34,39952	38,54272	37,25188	33,74665
14:33	145	34,73383	32,24217	33,14699	35,79457	36,77828	37,19987	34,32159	34,34264	32,22648	33,02201	39,23576	36,45051	33,84151	33,4468	33,46688	32,75034	32,49077	33,16145	34,60374	38,17835	37,15496	33,97089
14:38	150	33,91042	31,41732	32,67894	34,39607	34,70132	35,11839	32,63594	32,47162	32,00592	32,65719	38,0124	36,44415	33,40604	33,11747	33,06646	32,20114	32,0716	32,49605	33,72696	36,77067	35,09817	33,10645
14:43	155	33,95871	31,96689	32,15304	34,01527	34,67807	35,02332	32,89949	32,80798	31,85703	32,68695	37,27568	34,93586	33,2569	33,07547	33,06036	32,30355	32,12008	32,61555	33,73922	36,3208	34,90918	33,22617
14:48	160	33,79822	32,16412	31,77636	34,11093	34,44567	34,79041	32,91777	32,82634	32,02367	32,7467	36,91596	34,67343	33,20922	32,99175	33,04843	32,47243	32,28495	32,85036	33,83083	36,02116	34,98503	33,39353
14:53	165	33,44069	32,1999	31,38124	33,68466	34,26658	34,53913	32,84608	32,75441	31,92737	32,68587	36,40416	34,32631	33,07697	32,85906	32,8443	32,33864	32,07504	32,74957	33,51665	35,49403	34,69239	33,14567
14:58	170	32,87381	31,77572	30,7398	33,24236	33,66286	33,96996	32,42118	32,25612	31,47334	32,3376	35,85674	33,94271	32,76522	32,51037	32,49619	32,03459	31,62886	32,30754	33,00468	34,80481	34,05679	32,7028
15:03	175	33,12929	32,10298	33,04331	33,24712	33,99046	34,22647	32,78484	32,72894	31,74998	32,57947	35,63882	33,8978	32,97079	32,82432	32,80962	32,91868	31,77232	32,52114	33,28889	34,87518	34,35505	32,99398
15:08	180	33,08315	32,0568	31,34538	32,85267	33,62176	33,92876	32,52347	32,43071	31,85415	32,5765	35,84502	33,7516	32,78896	32,53419	32,59164	32,15588	31,81297	32,41846	33,11528	34,59497	34,05525	32,81394
15:13	185	32,36062	31,44117	30,26013	32,21991	32,96952	33,27507	31,97847	31,73993	31,61299	32,29852	35,29602	33,50972	32,40418	32,18399	32,24205	31,87524	31,4275	32,0008	32,62756	33,75166	33,47064	32,21642
15:18	190	32,76091	31,91331	32,49422	32,82789	33,37057	33,56924	32,30801	32,2505	31,47441	32,4104	35,12591	33,3349	32,65896	32,40373	32,42558	32,49483	31,63996	32,42572	33,08688	34,32113	33,78814	32,82495
15:23	195	32,78989	31,87072	32,55919	32,95913	33,39961	33,59835	32,40878	32,27966	31,40437	32,3401	35,33642	33,44378	32,62458	32,40514	32,46282	31,95339	31,73999	32,41762	33,25695	34,34496	33,80779	32,9563
15:28	200	32,51452	31,55937	31,78016	32,54196	33,15957	33,35775	32,16861	32,03869	31,05838	31,99277	34,99878	33,74158	32,38533	32,12918	32,18733	31,60276	31,28319	32,07231	32,84142	33,92973	33,51793	32,57456
15:33	205	31,69881	30,88639	34,55046	32,36298	32,44993	32,64649	31,45861	31,36229	30,79879	31,51694	34,74546	32,69311	32,01179	31,72458	31,74756	31,30348	30,95834	31,64323	32,44927	33,60913	32,87611	32,14472
15:38	210	31,9674	31,22675	31,44651	32,39073	32,68314	32,91616	31,69193	31,63239	30,66396	31,59684	34,68364	32,98792	31,99023	31,69681	31,7557	31,3117	31,02244	31,77822	32,44128	33,60114	33,07878	32,24413
15:43	215	31,86561	31,19653	31,20064	32,14623	32,58116	32,77802	31,58991	31,49403	30,75217	31,5419	34,59535	32,68218	31,82799	31,64179	31,66492	31,1838	30,99239	31,7127	32,30465	33,46463	32,98273	32,07104
15:48	220	31,66838	31,03502	30,78705	31,99151	32,41944	32,57997	31,42809	31,33168	30,64204	31,39544	34,38324	32,46419	31,61024	31,45923	31,48266	31,10841	30,90853	31,59388	32,18617	33,34624	32,84572	31,95198
15:53	225	31,58265	30,91343	37,01309	31,70637	32,19009	32,35008	31,23452	31,17346	30,53787	31,29086	34,17693	32,25216	31,47006	31,28265	31,30637	30,9304	30,6932	31,48782	32,0091	33,16932	32,57989	31,77407
15:58	230	31,30605	30,70834	29,84802	31,37357	31,91296	32,14422	31,02903	30,9673	30,19918	31,09438	33,98591	31,91242	31,27396	31,12184	31,1817	30,73205	30,35763	31,19116	31,74894	32,87372	32,25901	31,51267
16:03	235	31,22471	30,6628	35,00773	31,34625	31,83146	31,99062	30,9475	30,88549	30,33513	30,94377	33,87437	31,90537	31,19527	31,04288	31,06701	30,65246	30,4745	31,23539	31,75739	32,84654	32,21088	31,55699
16:08	240	31,05469	30,49272	35,87661	31,09165	31,58936	31,78393	30,7771	30,6785	30,07122	30,82237	33,72146	31,67649	31,0383	30,84945	30,87391	31,03708	30,36222	31,08841	31,61082	32,66443	32,00906	31,37388
16:13	245	30,81532	30,28906	37,31988	30,88442	31,3854	31,54353	30,57306	30,50981	29,79653	30,6184	33,45334	31,5444	30,87055	30,68113	30,70588	30,36024	29,97276	30,80989	31,36876	32,45821	31,76627	31,13067
16:18	250	30,82294	30,11752	37,43482	30,64079	31,1777	31,4073	30,43709	30,37338	29,7275	30,47729	33,28126	31,08054	30,58641	30,46795	30,49305	31,63049	29,83547	30,60231	31,09043	32,14443	31,5522	30,88686
16:23	255	30,64818	29,94265	35,43426	30,5396	31,00257	31,19578	30,2619	30,16157	29,53591	30,24902	32,9895	31,06771	30,50193	30,34723	30,37253	30,02366	29,70673	30,47479	30,92757	31,94604	31,41115	30,75907
16:28	260	30,38024	29,71043	36,45572	30,34685	30,76998	30,99865	29,99332	29,92814	29,46092	30,10192	32,9163	30,99249	30,31928	30,19993	30,18959	31,28815	29,57525	30,30875	30,83337	31,85191	31,15285	30,62858
16:29	265	30,35041	29,64474	32,59016	30,31333	30,7401	30,93271	29,96342	29,8621	29,32944	30,07765	32,85777	30,82469	30,29505	30,13966	30,16532	29,77815	29,54146	30,27526	30,79998	31,78287	31,1454	30,55915
16:30	270	30,37651	29,67084	32,65218	30,37283	30,76625	30,92293	29,98958	29,88835	29,28522	29,99735	32,7797	30,78035	30,21491	30,09522	30,08505	29,6246	29,46069	30,15946	30,7202	31,70314	31,11605	30,51485

Lampiran 20. Olah data temperatur rata-rata *discharging* tanggal 17 Desember 2016

Waktu		T rata PCM	T rata air	K3 rata	K14 rata	K24 rata
12:13	5	60,26556	60,2874	66,5589	60,3785536	53,8592
12:18	10	59,68344	59,3366	65,14135	59,6265264	54,2825
12:23	15	58,39546	58,1900953	63,38028	57,8948258	53,9113
12:28	20	57,35094	57,1178116	62,37835	56,7657213	52,9087
12:33	25	57,34442	56,9069011	62,46955	57,0165654	52,5471
12:38	30	55,77217	55,2282906	60,96554	55,9496402	50,4013
12:43	35	54,56001	53,9525281	59,2011	55,45399	49,0249
12:48	40	52,83147	51,8066984	57,04383	54,4606838	46,9899
12:53	45	51,84972	50,5024402	56,00263	53,8427025	45,7038
12:58	50	51,1366	49,9742503	55,39391	53,1441328	44,8717
13:03	55	50,22685	48,3194933	55,08688	52,0209339	43,5727
13:08	60	49,5379	48,2122394	54,46701	50,6544034	43,4923
13:13	65	49,00521	47,4947064	54,29245	49,8581358	42,8650
13:18	70	48,01288	46,5409346	53,44763	48,353675	42,2373
13:23	75	46,63053	45,3684005	52,17157	46,7533801	40,9666
13:28	80	46,29574	45,2562023	51,88672	46,4318575	40,5687
13:33	85	45,75235	44,766247	51,41989	45,9810423	39,8561
13:38	90	43,9556	42,9435135	49,52764	44,0284685	38,3107
13:43	95	42,32985	41,3687234	47,71719	42,1757907	37,0966
13:48	100	41,20838	40,3036686	46,64675	40,9941773	35,9842
13:53	105	40,52724	39,6028253	45,8609	40,2692684	35,4515
13:58	110	39,41195	38,763666	44,28354	38,9257158	35,0266
14:03	115	38,83233	37,9756231	43,45769	38,4545502	34,5848
14:08	120	38,29255	37,5867818	42,46485	37,9413563	34,4715
14:13	125	38,76198	37,0986473	42,93195	39,107477	34,2465
14:18	130	37,84723	36,1505629	41,54595	38,3617201	33,6340
14:23	135	34,76666	34,9715096	37,39494	34,1827295	32,7223
14:28	140	34,68687	34,5621887	37,2429	34,3173679	32,5003
14:33	145	34,64848	34,5260822	36,98908	34,3321143	32,6242
14:38	150	33,26507	34,0456067	34,90986	32,5537822	32,3316
14:43	155	33,32547	33,7182708	34,8507	32,8537331	32,2720
14:48	160	33,29176	33,6565972	34,61804	32,8720529	32,3852
14:53	165	33,16991	33,417782	34,40286	32,8002434	32,3066
14:58	170	32,68684	33,0335251	33,81641	32,3386538	31,9055
15:03	175	33,01003	33,2617664	34,10846	32,7568894	32,1647
15:08	180	32,82256	33,0686069	33,77526	32,4770945	32,2153
15:13	185	32,31242	32,7055275	33,1223	31,8591974	31,9558
15:18	190	32,56385	32,869123	33,4699	32,2792557	31,9424
15:23	195	32,57181	32,8523038	33,49898	32,3442201	31,8722
15:28	200	32,29596	32,6183067	33,25866	32,1036485	31,5256
15:33	205	31,70551	32,1700631	32,54821	31,4104502	31,1579
15:38	210	31,86407	32,2069183	32,79965	31,662162	31,1304
15:43	215	31,78953	32,0840622	32,67959	31,5419724	31,1470
15:48	220	31,63278	31,916642	32,4997	31,3798865	31,0187
15:53	225	31,46281	31,7302534	32,27008	31,2039874	30,9144
15:58	230	31,22451	31,5093584	32,02859	30,9981629	30,6468
16:03	235	31,15566	31,4588348	31,91104	30,9164983	30,6394
16:08	240	30,95375	31,3655581	31,68664	30,7278006	30,4468
16:13	245	30,73779	31,0840457	31,46447	30,5414339	30,2075
16:18	250	30,60004	31,0535957	31,2925	30,4052323	30,1024
16:23	255	30,40113	30,7156135	31,09917	30,2117387	29,8925
16:28	260	30,20882	30,7829981	30,88431	29,9607288	29,7814
16:29	265	30,1509	30,5145871	30,83641	29,912759	29,7035
16:30	270	30,14161	30,4343581	30,84459	29,9389618	29,6413

Lampiran 21. Olah data tanggal 17 Desember 2016

Waktu		Massa air	Temperatur awal air	Temperatur akhir air	T rata-rata air	Kalor jenis air	Energi ekstraksi sesaat	Energi ekstraksi kumulatif
Jam	Menit ke-	(kg)	(°C)	(°C)	(°C)	(kJ/kg. °C)	(kW)	(kW)
1	2	3	4	5	6=(4+5)/2	7	8=3x7x(4-5)/t	9
12:14	0	47,83	60,2874	59,3366	59,8120	4,1845	11,4180	11,4180
12:19	5	47,83	59,3366	58,1901	58,7633	4,1841	13,7666	25,1846
12:24	10	47,83	58,1901	57,1178	57,6540	4,1836	12,8739	38,0585
12:29	15	47,83	57,1178	56,9069	57,0124	4,1833	2,5320	40,5906
12:34	20	47,83	56,9069	55,2283	56,0676	4,1830	20,1504	60,7410
12:39	25	47,83	55,2283	53,9525	54,5904	4,1824	15,3125	76,0535
12:44	30	47,83	53,9525	51,8067	52,8796	4,1818	25,7518	101,8053
12:49	35	47,83	51,8067	50,5024	51,1546	4,1812	15,6501	117,4554
12:54	40	47,83	50,5024	49,9743	50,2383	4,1809	6,3374	123,7928
12:59	45	47,83	49,9743	48,3195	49,1469	4,1806	19,8530	143,6458
13:04	50	47,83	48,3195	48,2122	48,2659	4,1804	1,2867	144,9325
13:09	55	47,83	48,2122	47,4947	47,8535	4,1803	8,6079	153,5404
13:14	60	47,83	47,4947	46,5409	47,0178	4,1801	11,4414	164,9818
13:19	65	47,83	46,5409	45,3684	45,9547	4,1798	14,0648	179,0465
13:24	70	47,83	45,3684	45,2562	45,3123	4,1797	1,3458	180,3923
13:29	75	47,83	45,2562	44,7662	45,0112	4,1796	5,8768	186,2692
13:34	80	47,83	44,7662	42,9435	43,8549	4,1794	21,8618	208,1310
13:39	85	47,83	42,9435	41,3687	42,1561	4,1791	18,8867	227,0177
13:44	90	47,83	41,3687	40,3037	40,8362	4,1789	12,7728	239,7906
13:49	95	47,83	40,3037	39,6028	39,9532	4,1788	8,4048	248,1953
13:54	100	47,83	39,6028	38,7637	39,1832	4,1787	10,0633	258,2587
13:59	105	47,83	38,7637	37,9756	38,3696	4,1787	9,4502	267,7089
14:04	110	47,83	37,9756	37,5868	37,7812	4,1786	4,6629	272,3718
14:09	115	47,83	37,5868	37,0986	37,3427	4,1786	5,8536	278,2254
14:14	120	47,83	37,0986	36,1506	36,6246	4,1786	11,3692	289,5946
14:19	125	47,83	36,1506	34,9715	35,5610	4,1786	14,1389	303,7335
14:24	130	47,83	34,9715	34,5622	34,7668	4,1786	4,9085	308,6420
14:29	135	47,83	34,5622	34,5261	34,5441	4,1786	0,4330	309,0749
14:34	140	47,83	34,5261	34,0456	34,2858	4,1786	5,7618	314,8367
14:39	145	47,83	34,0456	33,7183	33,8819	4,1786	3,9254	318,7620
14:44	150	47,83	33,7183	33,6566	33,6874	4,1786	0,7396	319,5016
14:49	155	47,83	33,6566	33,4178	33,5372	4,1786	2,8638	322,3655
14:54	160	47,83	33,4178	33,3335	33,3757	4,1787	1,0104	323,3759
14:59	165	47,83	33,3335	33,2618	33,2976	4,1787	0,8605	324,2364
15:04	170	47,83	33,2618	33,0686	33,1652	4,1787	2,3164	326,5527
15:09	175	47,83	33,0686	32,7055	32,8871	4,1787	4,3540	330,9068
15:14	180	47,83	32,7055	32,6691	32,6873	4,1787	0,4366	331,3433
15:19	185	47,83	32,6691	32,5523	32,6107	4,1787	1,4009	332,7442
15:24	190	47,83	32,5523	32,3183	32,4353	4,1787	2,8061	335,5504
15:29	195	47,83	32,3183	32,1701	32,2442	4,1787	1,7778	337,3281
15:34	200	47,83	32,1701	32,1069	32,1385	4,1787	0,7572	338,0854
15:39	205	47,83	32,1069	32,0841	32,0955	4,1788	0,2741	338,3595
15:44	210	47,83	32,0841	31,9166	32,0004	4,1788	2,0077	340,3672
15:49	215	47,83	31,9166	31,7303	31,8234	4,1788	2,2352	342,6024
15:54	220	47,83	31,7303	31,5094	31,6198	4,1788	2,6490	345,2515
15:59	225	47,83	31,5094	31,4588	31,4841	4,1788	0,6059	345,8574
16:04	230	47,83	31,4588	31,3656	31,4122	4,1788	1,1186	346,9760