

LAMPIRAN

LAMPIRAN 1. Kalibrasi Orifice

Keterangan $D_1 = 0,0127$ m diameter pipa tembaga $A_1 = 0,000127$ m² $m_{air} = 0,001$ N.s/m²
 $D_2 = 0,002$ m diameter lubang orifice $A_2 = 3,14 \times 10^6$ m² $\rho_{air} = 1000$ kg/m³

Percobaan	Vair	Vair	Exp. 1				Δ Prata-rata	v1 (orifice)	Re	A2. (2/rair) ^{0.5} (DP) ^{0.5}	(1- (A2/A1) ²) ^{0.5}	Vair,ideal (m3/dt)	Vair,aktua (m3/s)	C	p.D1.mai r/(4.rair)	C
	(LPM)	(m3/s)	zkiri (cm)	zkanan (cm)	Δz (cm)	ΔP (N/m2)								Rumus 52		Rumus 57
	1	0	0	74.5	74.5	0										-
2	1	1.67E-05	82.3	64.8	17.5	23,347.80	23,347.80	0.13157	1,671	2.15E-05	0.999692	2.10E-05	3.60E-10	1.67E-05	9.97E-09	0.776117
3	1.2	0.00002	86.4	60.6	25.8	34,421.30	34,421.30	0.15788	2,005	2.61E-05	0.999692	2.60E-05	4.30E-10	2.00E-05	9.97E-09	0.767039
4	1.4	2.33E-05	90	56.9	33.1	44,160.70	44,160.70	0.1842	2,339	2.95E-05	0.999692	3.00E-05	4.90E-10	2.33E-05	9.97E-09	0.790061
5	1.6	2.67E-05	95.8	51.1	44.7	59,637.00	59,637.00	0.21051	2,673	3.43E-05	0.999692	3.40E-05	5.70E-10	2.67E-05	9.97E-09	0.776985
6	1.8	0.00003	102	45.2	56.8	75,780.30	75,780.30	0.23682	3,008	3.87E-05	0.999692	3.90E-05	6.40E-10	3.00E-05	9.97E-09	0.775434
7	2	3.33E-05	107	40	67	89,388.70	89,388.70	0.26314	3,342	4.20E-05	0.999692	4.20E-05	7.00E-10	3.33E-05	9.97E-09	0.793303

LAMPIRAN 2. Kalibrasi Termokopel

T1	T Standard (°C)	T2	T Standard (°C)	T3	T Standard (°C)	T4	T Standard (°C)	T5	T Standard (°C)	T6	T Standard (°C)	T7	T Standard (°C)	T8	T Standard (°C)	T9	T Standard (°C)	T10	T Standard (°C)
6	6	5.8	6	5.8	6	5.8	6	6.7	6	6.7	6	6.8	6	6.7	6	5.8	6	5.5	6
6.8	7	6.5	7	6.5	7	6.5	7	7.3	7	7.6	7	7.6	7	7.5	7	7.1	7	6	7
9.9	10	9.8	10	9.8	10	10	10	10.7	10	10.6	10	10.7	10	10.7	10	9.6	10	9.5	10
12.1	12	12	12	12	12	12.1	12	12.7	12	12.7	12	12.9	12	12.8	12	11.7	12	11.6	12
13.1	13	13.1	13	13.1	13	13.2	13	13.9	13	13.9	13	13.9	13	13.9	13	12.8	13	12.8	13
15.2	15	15.2	15	15.2	15	15.2	15	15.9	15	15.9	15	15.9	15	15.9	15	14.8	15	14.8	15
17	17	17	17	17	17	17.1	17	17.8	17	17.7	17	17.8	17	17.8	17	16.7	17	16.7	17
19	19	19	19	19	19	19	19	19.7	19	19.7	19	19.7	19	19.7	19	18.7	19	18.6	19
20.1	20	20	20	20.1	20	20.1	20	20.7	20	20.7	20	20.8	20	20.8	20	19.8	20	19.7	20
22.2	22	22.2	22	22.2	22	22.3	22	22.8	22	22.8	22	22.9	22	23	22	21.8	22	21.9	22
23.2	23	23.2	23	23.2	23	23.2	23	23.8	23	23.9	23	23.9	23	24	23	22.9	23	22.9	23
25	25	25.1	25	25.1	25	25.2	25	25.7	25	25.8	25	25.8	25	25.8	25	24.7	25	24.8	25
26.9	27	26.9	27	26.9	27	27	27	27.5	27	27.5	27	27.6	27	26.5	27	26.6	27	26.7	27
29	29	29.1	29	29.1	29	29.2	29	29.7	29	29.7	29	29.5	29	29.8	29	28.7	29	28.8	29
31.2	31	31.3	31	31.4	31	31.4	31	31.9	31	31.9	31	31.8	31	31.9	31	31	31	31	31
33.5	33	33.8	33	33.7	33	33.8	33	34.3	33	34.1	33	33.5	33	34.5	33	33.2	33	33.4	33
36.2	36	36.3	36	36.3	36	36.4	36	36.7	36	36.8	36	36.6	36	36.8	36	35.9	36	36.6	36
39.2	39	39.3	39	39.4	39	39.4	39	39.6	39	39.8	39	39.6	39	39.8	39	38.9	39	39	39
41.2	41	41.4	41	41.5	41	41.6	41	41.8	41	41.9	41	41.6	41	41.9	41	41.1	41	41.2	41
44.3	44	44.4	44	44.5	44	44.5	44	44.8	44	44.9	44	44.5	44	44.9	44	44.1	44	44.2	44
46.2	46	46.6	46	46.5	46	46.5	46	46.8	46	47.4	46	46	46	46.8	46	46.1	46	46.3	46
48.3	48	48.5	48	48.5	48	48.6	48	48.8	48	48.8	48	48.5	48	48.9	48	48	48	48.2	48
49.5	49	49.8	49	49.9	49	49.9	49	50.1	49	50.2	49	49.4	49	50	49	49.3	49	49.5	49
51.5	51	51.7	51	51.7	51	51.8	51	51.9	51	52	51	51.7	51	52.1	51	51.3	51	51.4	51
53.7	53	53.9	53	54	53	54	53	54.1	53	54.1	53	53.6	53	54.2	53	53.5	53	53.7	53
56.5	56	56.7	56	56.8	56	56.8	56	56.9	56	57	56	56.6	56	57	56	56.3	56	56.4	56
60	59	60.4	59	60.5	59	60.7	59	60.6	59	60.8	59	59.9	59	60.4	59	59.8	59	60.2	59
61.8	61	61.9	61	61.9	61	62.2	61	62.2	61	62.2	61	61.7	61	62.5	61	61.4	61	61.7	61
65.1	64	65.1	64	65.4	64	65.4	64	65.4	64	65.5	64	64.9	64	65.8	64	64.8	64	64.7	64
67.9	67	67.9	67	68.2	67	68	67	68.1	67	68.3	67	67.8	67	68.5	67	67.7	67	67.6	67
70.5	69	70.8	69	70.8	69	70.6	69	70.7	69	71	69	70.3	69	70.8	69	70.3	69	70.3	69
72.6	71	72.9	71	72.9	71	73.1	71	73.1	71	73.3	71	72.2	71	72.8	71	72.4	71	72.7	71
74.8	73	75	73	75	73	75.3	73	75.1	73	75.1	73	74.3	73	74.8	73	74.6	73	74.8	73

LAMPIRAN 2. Kalibrasi Termokopel (Lanjutan)

T11	T Standard (°C)	T12	T Standard (°C)	T13	T Standard (°C)	T14	T Standard (°C)	T15	T Standard (°C)	T16	T Standard (°C)	T17	T Standard (°C)	T18	T Standard (°C)	T19	T Standard (°C)	T20	T Standard (°C)
5.5	6	5.5	6	5.6	6	5.3	6	5.3	6	5.4	6	6.2	6	6.4	6	6.7	6	6.3	6
6.2	7	6.2	7	6.5	7	6.1	7	5.9	7	6.1	7	7.2	7	6.9	7	6.9	7	7.2	7
9.6	10	9.7	10	9.3	10	9.3	10	9.5	10	9.5	10	10.3	10	10.4	10	10.4	10	10.4	10
11.6	12	11.7	12	11.5	12	11.4	12	11.5	12	11.6	12	12.5	12	12.5	12	12.5	12	12.6	12
12.8	13	12.9	13	12.7	13	12.6	13	12.7	13	12.7	13	13.6	13	13.6	13	13.6	13	13.7	13
14.9	15	14.9	15	14.7	15	14.5	15	14.7	15	14.7	15	15.6	15	15.6	15	15.7	15	15.7	15
16.7	17	16.8	17	16.7	17	16.4	17	16.6	17	16.6	17	17.5	17	17.5	17	17.6	17	17.6	17
18.7	19	18.8	19	18.6	19	18.4	19	18.5	19	18.5	19	19.4	19	19.4	19	19.5	19	19.5	19
19.8	20	19.9	20	19.6	20	19.5	20	19.6	20	19.6	20	20.5	20	20.5	20	20.5	20	20.6	20
21.9	22	22	22	21.7	22	21.7	22	21.8	22	21.8	22	22.6	22	22.6	22	22.6	22	22.7	22
22.9	23	23	23	22.8	23	22.7	23	22.8	23	22.8	23	23.6	23	23.7	23	23.7	23	23.8	23
24.8	25	24.9	25	24.6	25	24.6	25	24.7	25	24.7	25	25.5	25	25.5	25	25.6	25	25.6	25
26.7	27	26.4	27	26.4	27	26.4	27	26.5	27	26.5	27	27.2	27	27.3	27	27.4	27	27.4	27
28.9	29	28.9	29	28.6	29	28.6	29	28.7	29	28.7	29	29.4	29	29.5	29	29.5	29	29.6	29
31.1	31	31.3	31	30.8	31	30.7	31	30.9	31	31	31	31.7	31	31.7	31	31.8	31	31.8	31
33.4	33	33.4	33	33.3	33	33	33	33.1	33	34.4	33	34	33	33.9	33	34	33	34	33
36.1	36	36.1	36	35.8	36	35.8	36	35.9	36	36	36	36.6	36	36.8	36	36.8	36	36.8	36
39	39	39.2	39	38.9	39	38.8	39	38.9	39	38.9	39	39.6	39	39.7	39	39.8	39	39.8	39
41.2	41	41.3	41	40.9	41	40.9	41	41.1	41	41.1	41	41.8	41	41.9	41	41.9	41	42	41
44.2	44	44.3	44	43.9	44	43.9	44	44.1	44	44.1	44	44.8	44	44.9	44	44.9	44	45	44
46.3	46	46.3	46	45.9	46	45.9	46	46	46	46.3	46	47.1	46	46.9	46	47.3	46	47.3	46
48.2	48	48.2	48	47.9	48	47.9	48	48	48	48.1	48	48.7	48	48.8	48	48.9	48	49	48
49.6	49	49.7	49	49.1	49	49.1	49	49.4	49	49.5	49	50.1	49	50.3	49	50.3	49	50.5	49
51.5	51	51.6	51	51.1	51	51.1	51	51.4	51	51.4	51	51.9	51	52.1	51	52.1	51	52.2	51
53.8	53	53.8	53	53.3	53	53.3	53	53.6	53	53.7	53	54.3	53	54.3	53	54.5	53	54.5	53
56.5	56	56.6	56	56	56	56.1	56	56.4	56	56.4	56	56.9	56	57.1	56	57.2	56	57.2	56
60.3	59	60.4	59	59.6	59	59.6	59	60.1	59	60.1	59	60.5	59	60.8	59	60.8	59	61	59
61.6	61	61.8	61	61.2	61	61.4	61	61.5	61	61.6	61	62.2	61	62.4	61	62.5	61	62.3	61
64.6	64	65.1	64	64.6	64	64.7	64	64.5	64	64.9	64	65.5	64	65.6	64	65.6	64	65.8	64
67.7	67	68	67	67.4	67	67.5	67	67.3	67	67.5	67	68.2	67	68.3	67	68.4	67	68.5	67
70.4	69	70.6	69	70	69	70.1	69	70.2	69	70.4	69	70.8	69	71.1	69	71.1	69	71.2	69
72.7	71	72.7	71	71.8	71	72.1	71	72.5	71	72.5	71	72.7	71	73.2	71	73.2	71	73.3	71
74.8	73	74.8	73	74.2	73	74.1	73	74.6	73	74.6	73	74.9	73	75.2	73	75.3	73	75.2	73

LAMPIRAN 3, Daftar Notasi Dan Singkatan

- \dot{q}_x = Fluks kalor (laju perpindahan kalor konduksi) (W/m^2)
 K = Konduktivitas termal material ($\text{W}/\text{m}\cdot^\circ\text{C}$)
 A = Luas penampang dialiri oleh kalor secara konduksi diukur tegak lurus arah aliran (m^2)
 $\frac{dT}{dx}$ = Gradien temperatur di arah x ($^\circ\text{C}/\text{m}$)
 \dot{q} = Laju perpindahan kalor konveksi (W/m^2)
 h atau \check{h} = Koefisien perpindahan kalor konveksi ($\text{W}/\text{m}^2\cdot\text{K}$)
 ΔT = Beda temperatur antara T^∞ (fluida, $^\circ\text{C}$) dengan T_s (permukaan, $^\circ\text{C}$)
 T = Temperatur
 Gr = *Grashof number*
 Ra = *Rayleigh number*
 Nu = *Bilangan Nusselt*
 L = Panjang geometri, m
 g = Kecepatan gravitasi bumi, kg/s
 β = Kekuatan daya apung, K^{-1}
 Pr = *Bilangan Prandtl*
 ν = Viskositas kinematik fluida, m^2/s
 α = *Thermal diffusivity*, m^2/s
 q_{konv} = Perpindahan kalor konveksi (Watt)
 q_{rad} = Perpindahan kalor radiasi (Watt)
 A_s = Luas Permukaan Geometri (m^2)
 T_s = Temperatur permukaan ($^\circ\text{C}$)
 T_{sur} = Temperatur lingkungan ($^\circ\text{C}$)
 h_4 = *Enthalpy* fluida jenuh terkompresi (kJ/kg)
 h_f = *Enthalpy* pada saturasi liquid (kJ/kg)
 h_g = *Enthalpy* pada saturasi uap (kJ/kg)
 h_x = *Enthalpy* tiap kenaikan kualitas
 x = Kualitas Uap
 h_{TP} atau h_{evap} = Koefisien perpindahan kalor evaporasi ($\text{W}/\text{m}^2\cdot^\circ\text{C}$)

LAMPIRAN 4, Keterangan Temperatur

- T2, T3, T4 = Temperatur dinding seksi uji
- T5 = T udara sebelum seksi uji
- T6 = T udara setelah seksi uji
- T7 = suction komp
- T8 = discharge komp
- T9 = T dalam SU (bawah) (masuk pipa)
- T10, T11, T12 = Temperatur dinding seksi uji
- T13 = T sebelum katup Ekspansi
- T14 = setelah katup Ekspansi
- T15 = T air keluar evap
- T16 = T air masuk evap
- T17 = T air keluar kondensor
- T18 = T air masuk kondensor
- T19 = T air pada tangka campur
- T20 = T air pada tangki utama