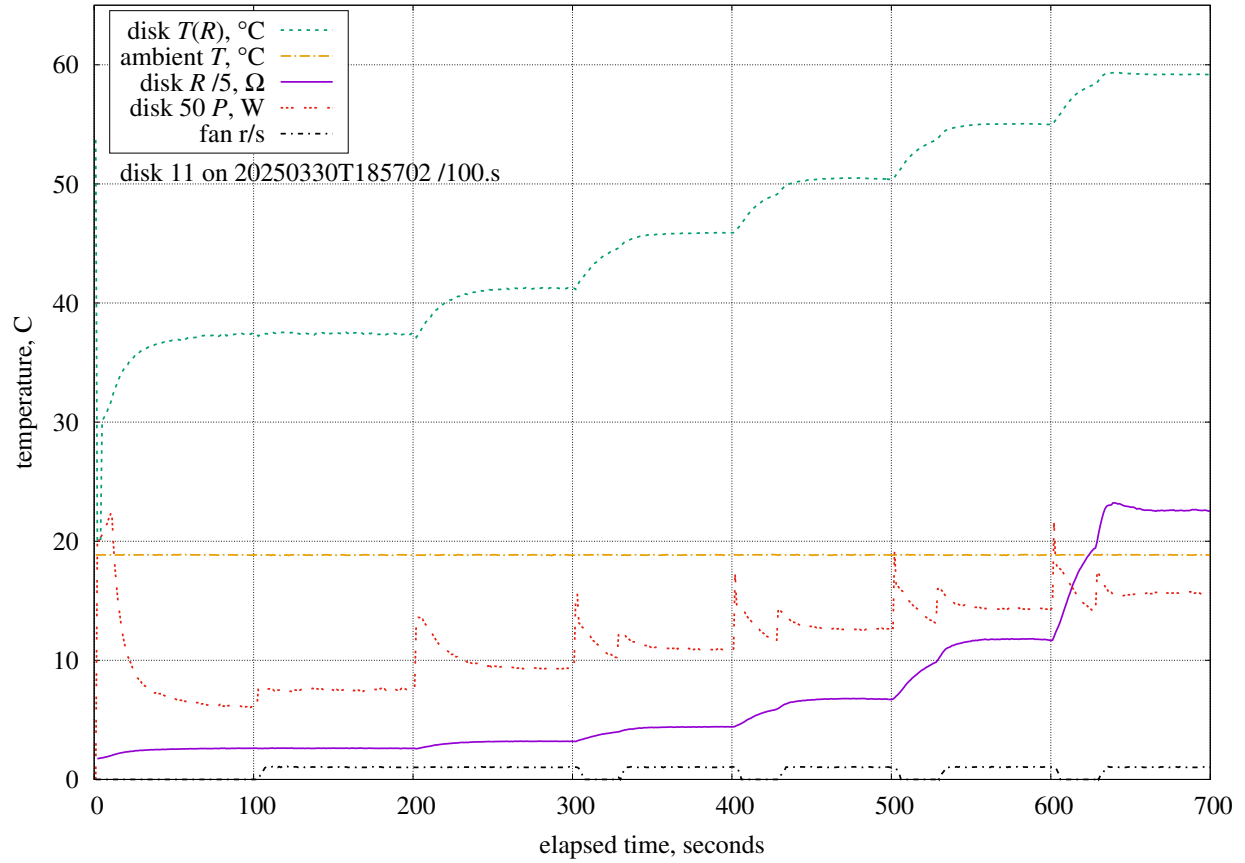


$\theta = 81.5^\circ$; $\psi = 98.5^\circ$; $V = 0.000$ m/s (0 r/min)

Estimated measurement uncertainties of natural convection at $\theta = 81.6$.

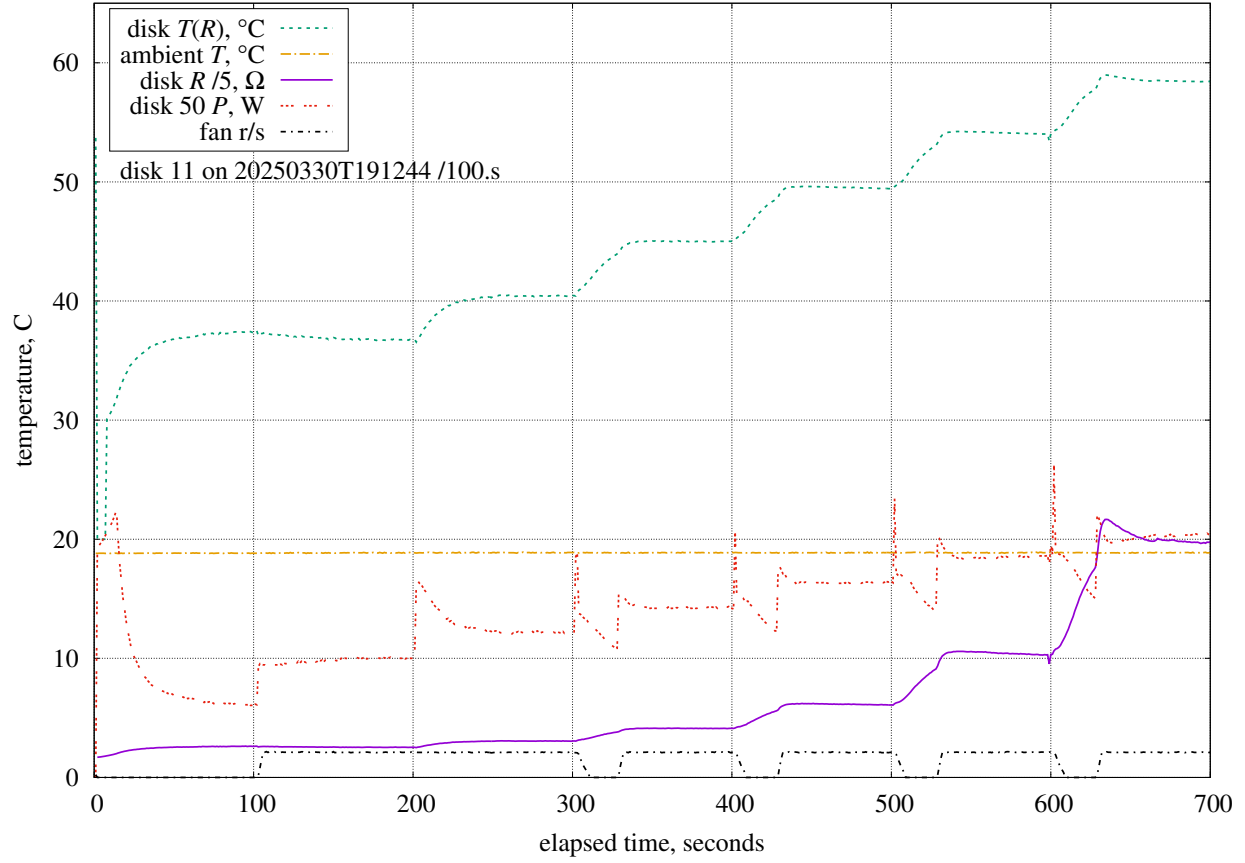
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
ΔT	25.0.K	+4.16%/K	0.10.K	0.42%	LM35C differential
C_S	0.420	-4.03%	0.050	0.20%	rim shape factor
D_o	2.81.mm	+1441%/m	500.um	0.72%	tube outer diameter
D_i	1.11.mm	+10787%/m	200.um	2.16%	tube inner diameter
D_g	166.um	-386%/m	750.um	0.29%	tube air gap
L_{wire}	38.0.mm	+1607%/m	500.um	0.80%	wire length
k_{ABS}	179. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	+0.188%/ $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	9.0. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	1.68%	ABS thermal conductivity
d	12.0.mm	+2039%/m	100.um	0.20%	disk diameter
				3.00%	combined bias uncertainty



$\theta = 81.5^\circ$; $\psi = 98.5^\circ$; $V = 0.186$ m/s (62 r/min)

Estimated measurement uncertainties at $Re = 138$.

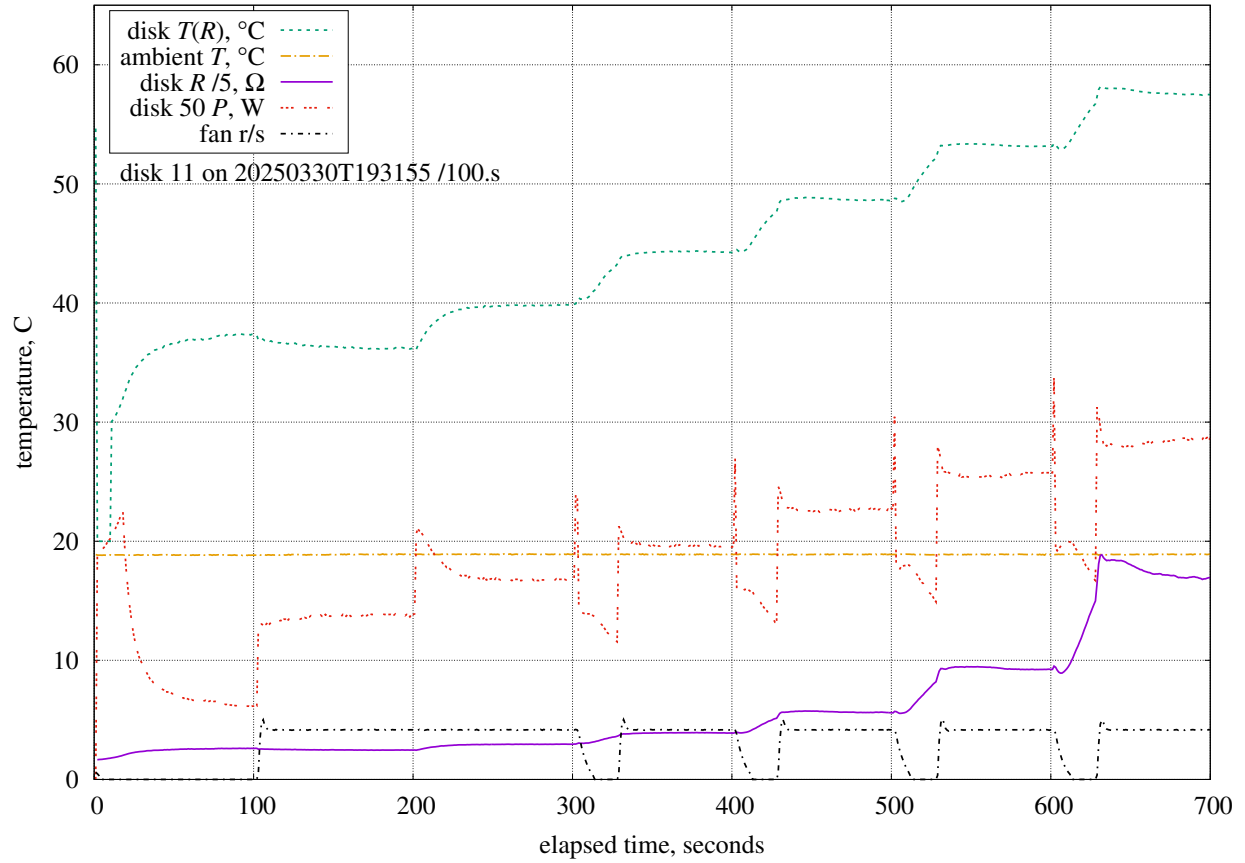
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
ΔT	25.0.K	+3.96%/K	0.10.K	0.40%	LM35C differential
P	101.kPa	+0.0004%/Pa	1.5.kPa	0.58%	MPXH6115A6U air pressure
η	0.340	+102%	0.007	0.69%	anemometer calibration
D_o	2.81.mm	-5989%/m	500.um	2.99%	tube outer diameter
D_i	1.11.mm	+11419%/m	200.um	2.28%	tube inner diameter
D_g	166.um	-426%/m	750.um	0.32%	tube air gap
L_{wire}	38.0.mm	+1777%/m	500.um	0.89%	wire length
k_{ABS}	179. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	+0.191%/ $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	9.0. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	1.71%	ABS thermal conductivity
d	12.0.mm	+2652%/m	100.um	0.27%	disk diameter
ϵ_{ABS}	0.920	-37.6%	0.010	0.38%	ABS emissivity
ϵ_{wt}	0.900	-37.8%	0.025	0.95%	wind-tunnel emissivity
				4.49%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	61.7.r/min	+0.559%/(r/min)	1.0.r/min	0.57%	fan rotation rate
				4.63%	RSS combined uncertainty



$\theta = 81.5^\circ$; $\psi = 98.5^\circ$; $V = 0.381$ m/s (127 r/min)

Estimated measurement uncertainties at $Re = 283$.

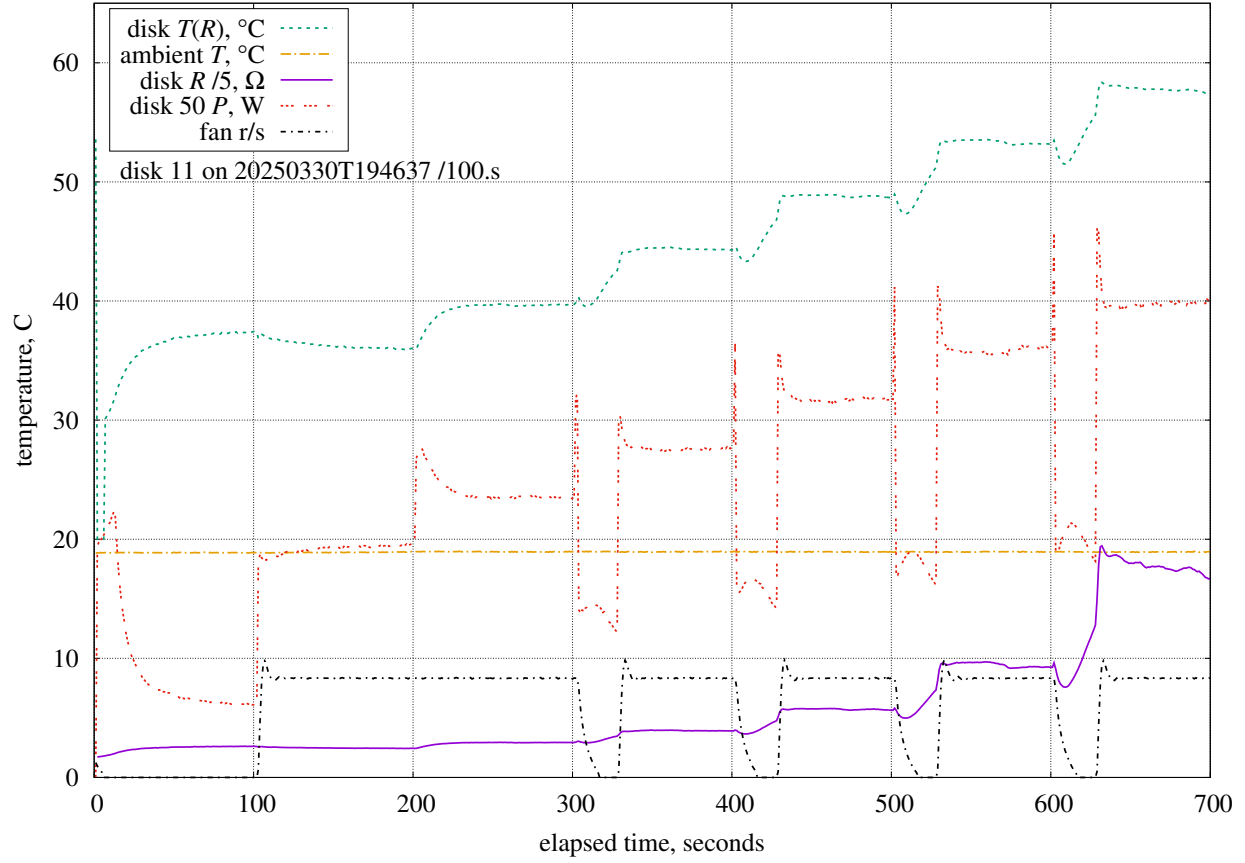
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	305.K	$-0.430\%/K$	0.50.K	0.21%	LM35C temperature sensor
ΔT	25.0.K	$+3.84\%/K$	0.10.K	0.38%	LM35C differential
P	101.kPa	$+0.0004\%/Pa$	1.5.kPa	0.64%	MPXH6115A6U air pressure
η	0.340	$+122\%$	0.007	0.83%	anemometer calibration
Re_0	600	-0.0066%	60	0.39%	integration lower-bound
D_o	2.81.mm	$-9341\%/m$	500.um	4.67%	tube outer diameter
D_i	1.11.mm	$+15227\%/m$	200.um	3.05%	tube inner diameter
D_g	166.um	$-556\%/m$	750.um	0.42%	tube air gap
L_{wire}	38.0.mm	$+2319\%/m$	500.um	1.16%	wire length
k_{ABS}	179. $\frac{mW}{K \cdot m}$	$+0.211\%/ \frac{mW}{K \cdot m}$	9.0. $\frac{mW}{K \cdot m}$	1.88%	ABS thermal conductivity
d	12.0.mm	$+2902\%/m$	100.um	0.29%	disk diameter
ϵ_{ABS}	0.920	-42.5%	0.010	0.42%	ABS emissivity
ϵ_{wt}	0.900	-43.0%	0.025	1.07%	wind-tunnel emissivity
				6.25%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	127.r/min	$+0.327\%/(r/min)$	1.00.r/min	0.33%	fan rotation rate
				6.28%	RSS combined uncertainty



$\theta = 81.5^\circ$; $\psi = 98.5^\circ$; $V = 0.748$ m/s (250 r/min)

Estimated measurement uncertainties at $Re = 556$.

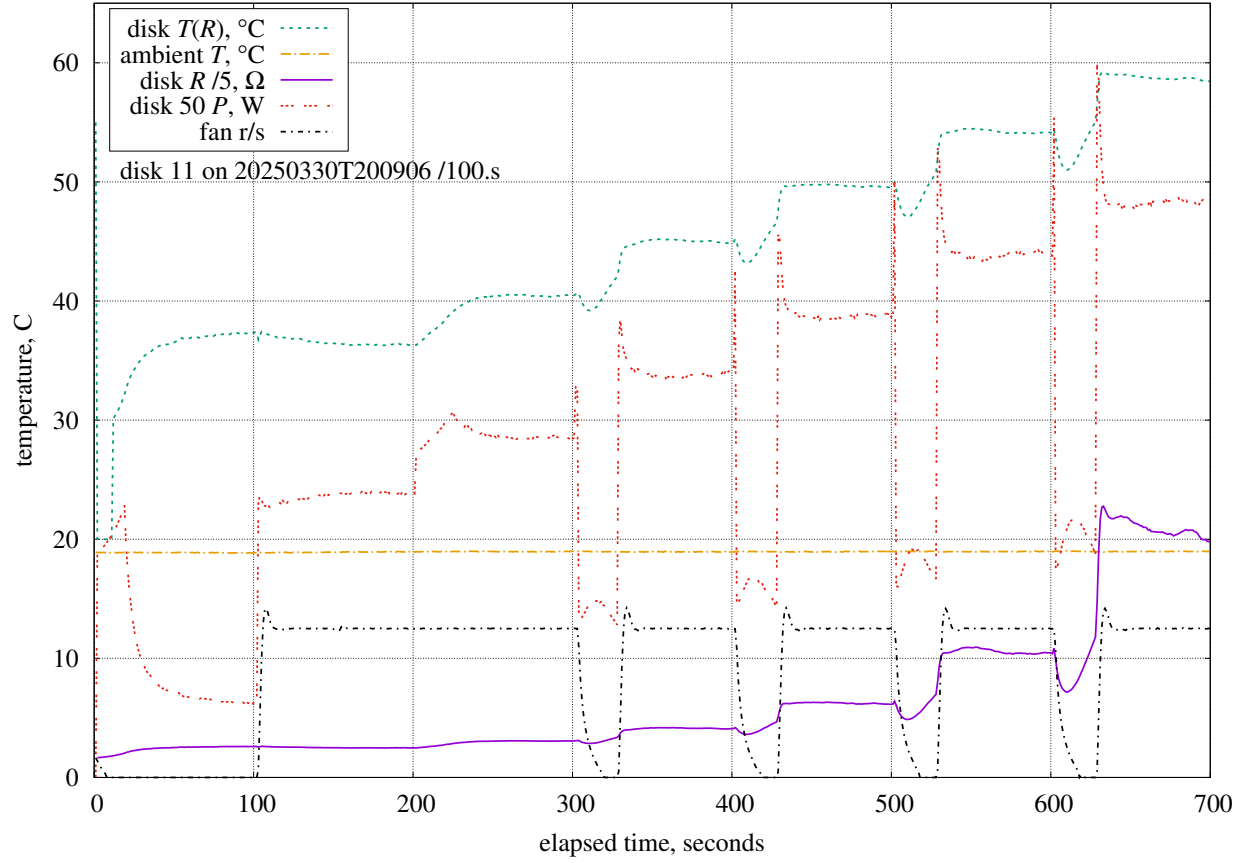
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	305.K	$-0.457\%/K$	0.50.K	0.23%	LM35C temperature sensor
ΔT	25.0.K	$+3.70\%/K$	0.10.K	0.37%	LM35C differential
P	101.kPa	$+0.0004\%/Pa$	1.5.kPa	0.66%	MPXH6115A6U air pressure
η	0.340	$+132\%$	0.007	0.90%	anemometer calibration
Re_0	600	-0.010%	60	0.61%	integration lower-bound
D_o	2.81.mm	$-12392\%/m$	500.um	6.20%	tube outer diameter
D_i	1.11.mm	$+18677\%/m$	200.um	3.74%	tube inner diameter
D_g	166.um	$-687\%/m$	750.um	0.52%	tube air gap
L_{wire}	38.0.mm	$+2864\%/m$	500.um	1.43%	wire length
k_{ABS}	179. $\frac{mW}{K \cdot m}$	$+0.222\%/ \frac{mW}{K \cdot m}$	9.0. $\frac{mW}{K \cdot m}$	1.99%	ABS thermal conductivity
d	12.0.mm	$+3586\%/m$	100.um	0.36%	disk diameter
ϵ_{ABS}	0.920	-43.7%	0.010	0.44%	ABS emissivity
ϵ_{wt}	0.900	-44.3%	0.025	1.11%	wind-tunnel emissivity
				7.87%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	250.r/min	$+0.180\%/(r/min)$	1.0.r/min	0.18%	fan rotation rate
				7.88%	RSS combined uncertainty



$\theta = 81.5^\circ$; $\psi = 98.5^\circ$; $V = 1.467$ m/s (500 r/min)

Estimated measurement uncertainties at $Re = 1089$.

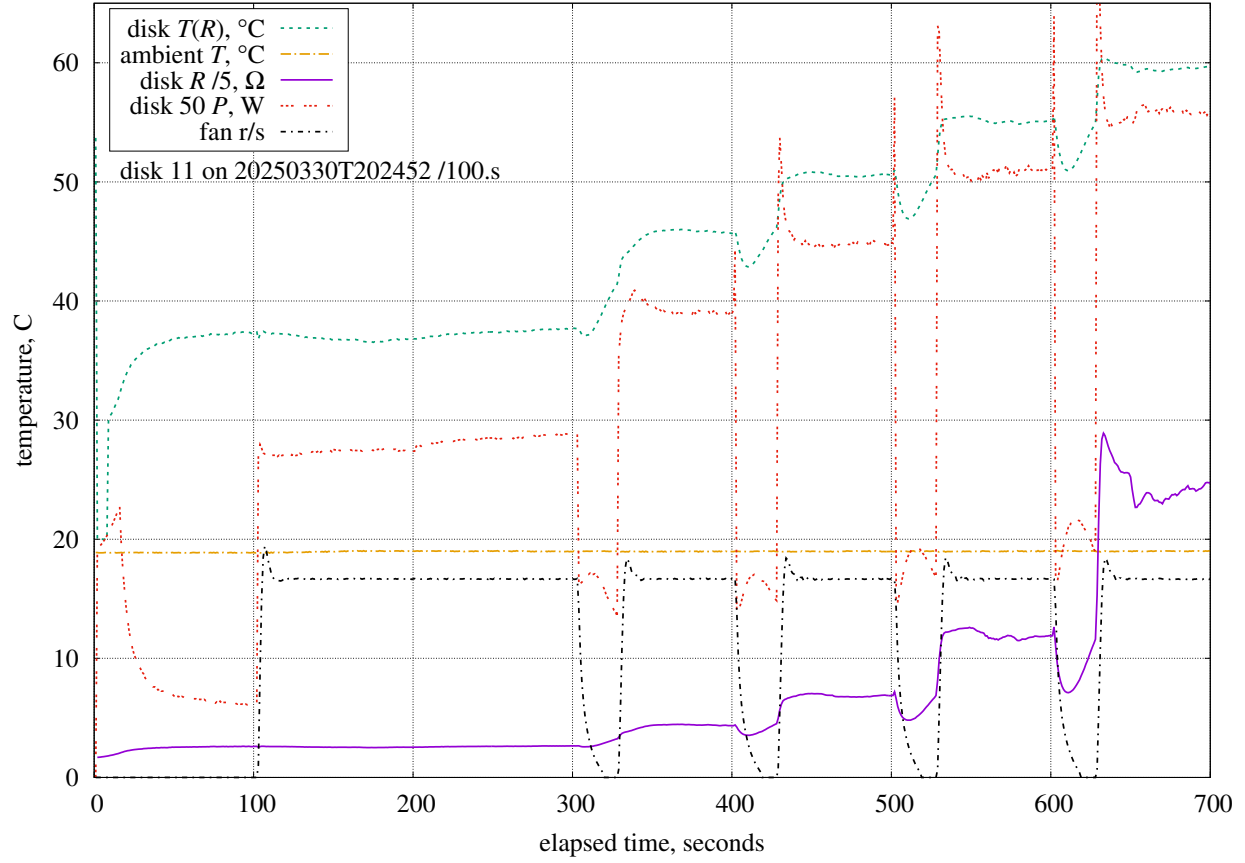
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	305.K	$-0.465\%/K$	0.50.K	0.23%	LM35C temperature sensor
ΔT	25.0.K	$+3.55\%/K$	0.10.K	0.36%	LM35C differential
P	101.kPa	$+0.0004\%/Pa$	1.5.kPa	0.65%	MPXH6115A6U air pressure
η	0.340	$+125\%$	0.007	0.85%	anemometer calibration
Re_0	600	-0.011%	60	0.67%	integration lower-bound
D_o	2.81.mm	$-15434\%/m$	500.um	7.72%	tube outer diameter
D_i	1.11.mm	$+21612\%/m$	200.um	4.32%	tube inner diameter
D_g	166.um	$-823\%/m$	750.um	0.62%	tube air gap
L_{wire}	38.0.mm	$+3432\%/m$	500.um	1.72%	wire length
k_{ABS}	179. $\frac{mW}{K \cdot m}$	$+0.228\%/ \frac{mW}{K \cdot m}$	9.0. $\frac{mW}{K \cdot m}$	2.04%	ABS thermal conductivity
d	12.0.mm	$+4344\%/m$	100.um	0.43%	disk diameter
ϵ_{ABS}	0.920	-44.2%	0.010	0.44%	ABS emissivity
ϵ_{wt}	0.900	-45.0%	0.025	1.12%	wind-tunnel emissivity
				9.44%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	500.r/min	$+0.085\%/(r/min)$	1.6.r/min	0.14%	fan rotation rate
				9.45%	RSS combined uncertainty



$\theta = 81.5^\circ$; $\psi = 98.5^\circ$; $V = 2.131$ m/s (750 r/min)

Estimated measurement uncertainties at $Re = 1582$.

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	305.K	$-0.484\%/K$	0.50.K	0.24%	LM35C temperature sensor
ΔT	25.0.K	$+3.42\%/K$	0.10.K	0.34%	LM35C differential
P	101.kPa	$+0.0004\%/Pa$	1.5.kPa	0.64%	MPXH6115A6U air pressure
η	0.340	$+117\%$	0.007	0.79%	anemometer calibration
Re_0	600	-0.011%	60	0.68%	integration lower-bound
D_o	2.81.mm	$-17482\%/m$	500.um	8.74%	tube outer diameter
D_i	1.11.mm	$+23050\%/m$	200.um	4.61%	tube inner diameter
D_g	166.um	$-908\%/m$	750.um	0.68%	tube air gap
L_{wire}	38.0.mm	$+3786\%/m$	500.um	1.89%	wire length
k_{ABS}	$179. \frac{mW}{K \cdot m}$	$+0.230\% / \frac{mW}{K \cdot m}$	$9.0. \frac{mW}{K \cdot m}$	2.06%	ABS thermal conductivity
d	12.0.mm	$+4733\%/m$	100.um	0.47%	disk diameter
ϵ_{ABS}	0.920	-46.3%	0.010	0.46%	ABS emissivity
ϵ_{wt}	0.900	-47.1%	0.025	1.18%	wind-tunnel emissivity
				10.46%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	750.r/min	$+0.053\%/(r/min)$	1.2.r/min	0.07%	fan rotation rate
				10.46%	RSS combined uncertainty



$\theta = 81.5^\circ$; $\psi = 98.5^\circ$; $V = 2.725$ m/s (1000 r/min)

Estimated measurement uncertainties at $Re = 2022$.

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	305.K	$-0.494\%/K$	0.50.K	0.25%	LM35C temperature sensor
ΔT	25.0.K	$+3.33\%/K$	0.10.K	0.33%	LM35C differential
P	101.kPa	$+0.0004\%/Pa$	1.5.kPa	0.63%	MPXH6115A6U air pressure
η	0.340	$+106\%$	0.007	0.72%	anemometer calibration
Re_0	600	-0.011%	60	0.67%	integration lower-bound
D_o	2.81.mm	$-18749\%/m$	500.um	9.37%	tube outer diameter
D_i	1.11.mm	$+23791\%/m$	200.um	4.76%	tube inner diameter
D_g	166.um	$-964\%/m$	750.um	0.72%	tube air gap
L_{wire}	38.0.mm	$+4016\%/m$	500.um	2.01%	wire length
k_{ABS}	$179. \frac{mW}{K \cdot m}$	$+0.230\% / \frac{mW}{K \cdot m}$	$9.0. \frac{mW}{K \cdot m}$	2.06%	ABS thermal conductivity
d	12.0.mm	$+5005\%/m$	100.um	0.50%	disk diameter
ϵ_{ABS}	0.920	-47.5%	0.010	0.47%	ABS emissivity
ϵ_{wt}	0.900	-48.3%	0.025	1.21%	wind-tunnel emissivity
				11.08%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	1000.r/min	$+0.036\%/(r/min)$	1.6.r/min	0.06%	fan rotation rate
				11.08%	RSS combined uncertainty