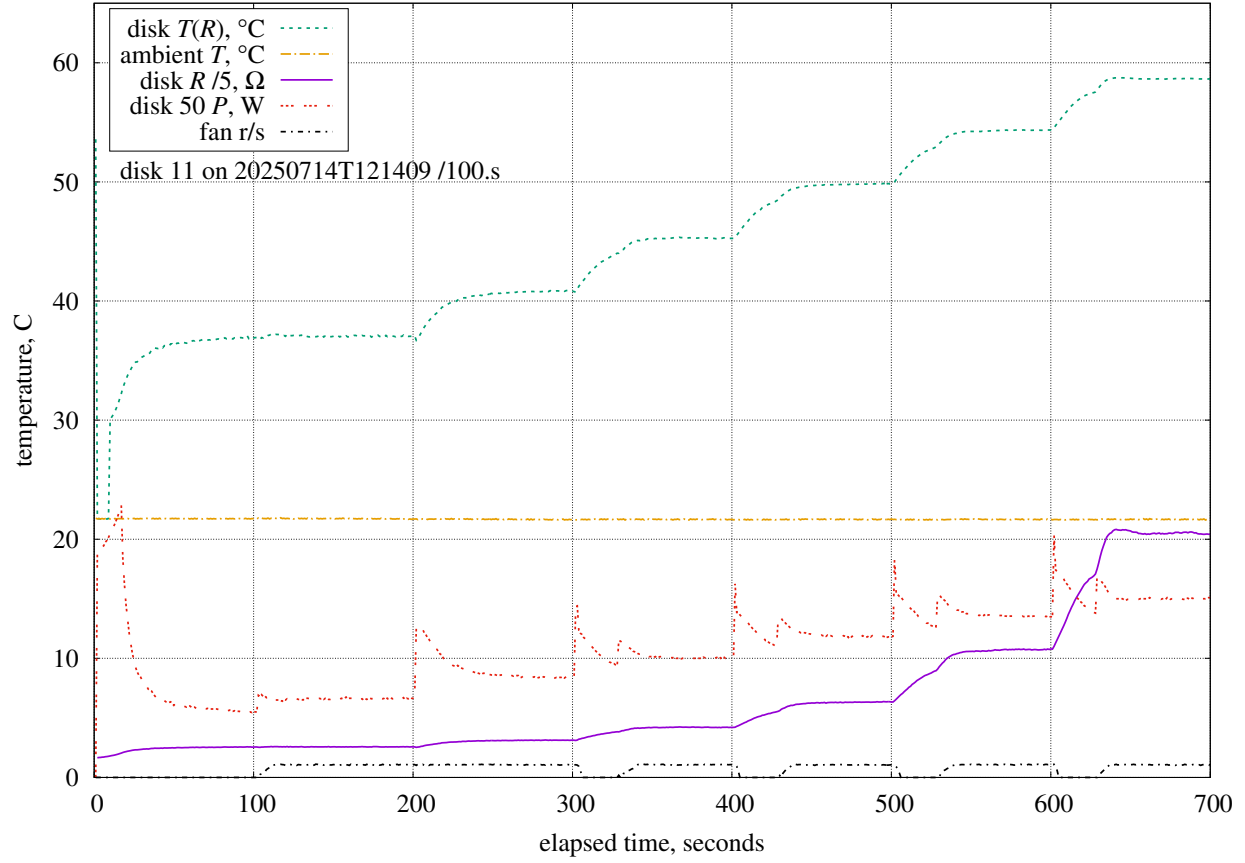


$\theta = 0.0^\circ$; $\psi = 0.0^\circ$; $V = 0.000$ m/s (0 r/min)

Estimated measurement uncertainties of natural convection at $\theta = 0.0$.

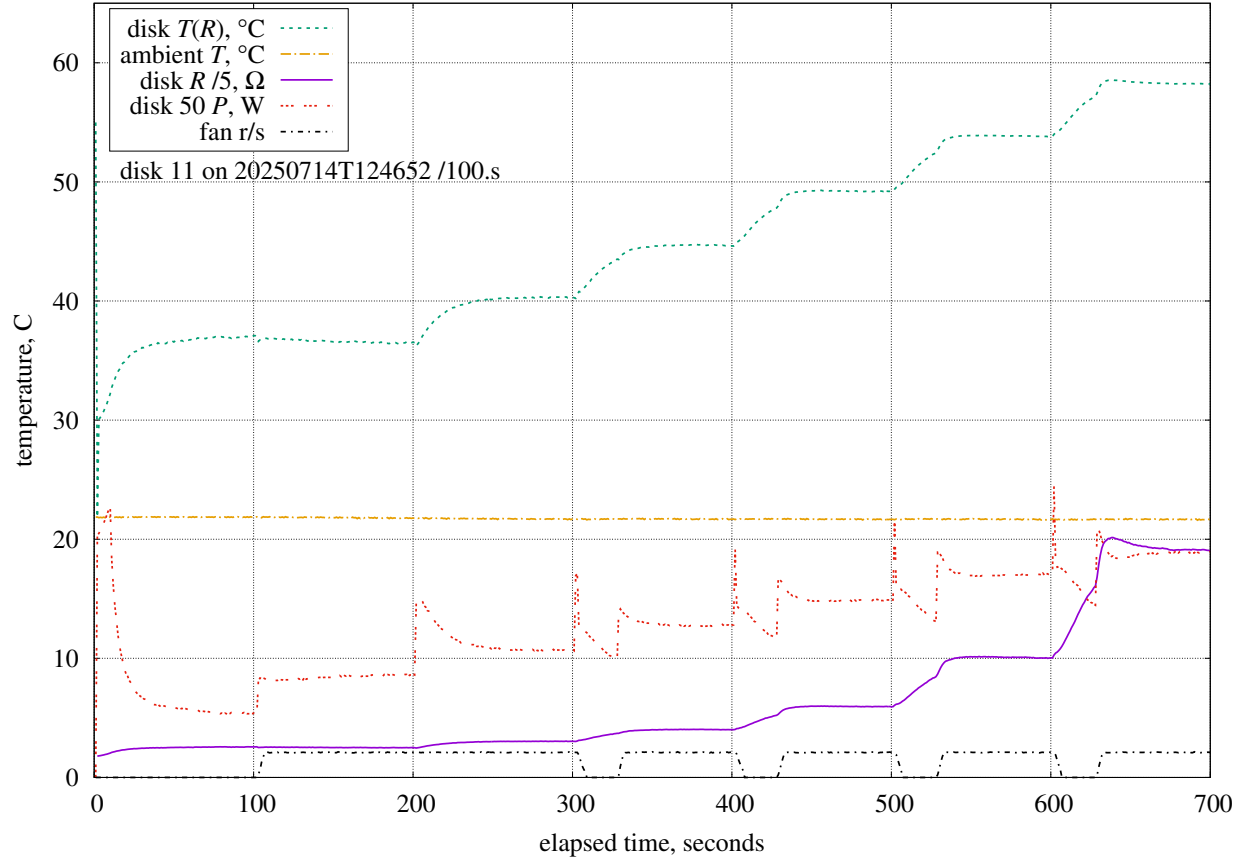
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
ΔT	25.0.K	+4.34%/K	0.10.K	0.43%	LM35C differential
P	101.kPa	+0.0002%/Pa	1.5.kPa	0.28%	MPXH6115A6U air pressure
D_o	2.81.mm	+3196%/m	500.um	1.60%	tube outer diameter
D_i	1.11.mm	+5242%/m	200.um	1.05%	tube inner diameter
L_{wire}	38.0.mm	+986%/m	500.um	0.49%	wire length
k_{ABS}	179. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	+0.123%/ $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	9.0. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	1.11%	ABS thermal conductivity
d	12.0.mm	+4893%/m	100.um	0.49%	disk diameter
θ	50.0.m°	+20.9%/°	0.20.°	4.19%	plate angle
				4.82%	combined bias uncertainty



$\theta = 0.0^\circ$; $\psi = 0.0^\circ$; $V = 0.194$ m/s (64 r/min)

Estimated measurement uncertainties at $Re = 141$.

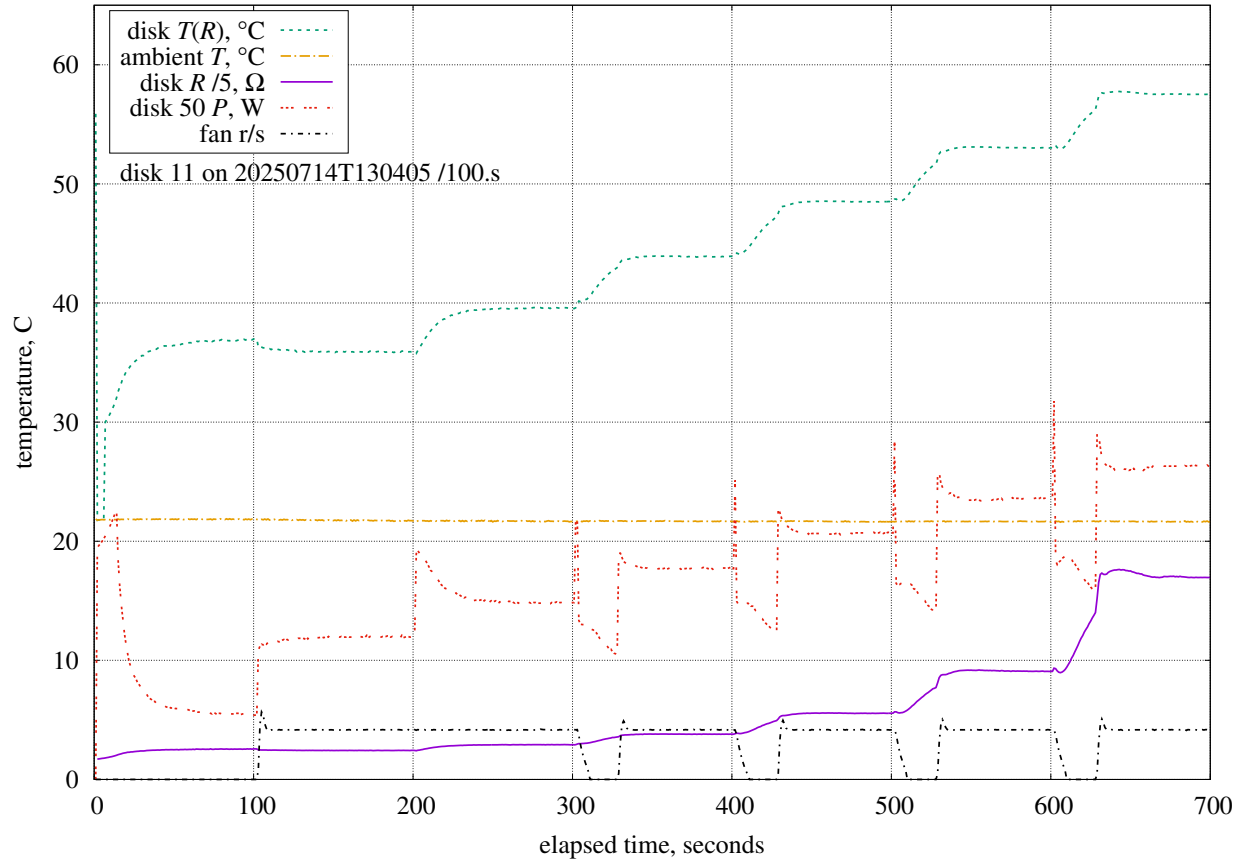
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
ΔT	25.0.K	+4.00%/K	0.10.K	0.40%	LM35C differential
P	101.kPa	+0.0004%/Pa	1.5.kPa	0.66%	MPXH6115A6U air pressure
η	0.340	+117%	0.007	0.80%	anemometer calibration
Re_0	600	-0.0056%	60	0.34%	integration lower-bound
D_o	2.81.mm	-5642%/m	500.um	2.82%	tube outer diameter
D_i	1.11.mm	+10261%/m	200.um	2.05%	tube inner diameter
D_g	166.um	-384%/m	750.um	0.29%	tube air gap
L_{wire}	38.0.mm	+1602%/m	500.um	0.80%	wire length
k_{ABS}	179. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	+0.170%/ $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	9.0. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	1.52%	ABS thermal conductivity
d	12.0.mm	+3966%/m	100.um	0.40%	disk diameter
ϵ_{ABS}	0.920	-35.6%	0.010	0.36%	ABS emissivity
ϵ_{wt}	0.900	-35.9%	0.025	0.90%	wind-tunnel emissivity
θ	50.0.m°	+11.6%/°	0.20.°	2.31%	plate angle
ψ	50.0.m°	-2623987%/°	0.25.°	655996.73%	flow angle
				655996.73%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	64.3.r/min	+0.619%/(r/min)	1.1.r/min	0.71%	fan rotation rate
				655996.73%	RSS combined uncertainty



$\theta = 0.0^\circ$; $\psi = 0.0^\circ$; $V = 0.380$ m/s (126 r/min)

Estimated measurement uncertainties at $Re = 277$.

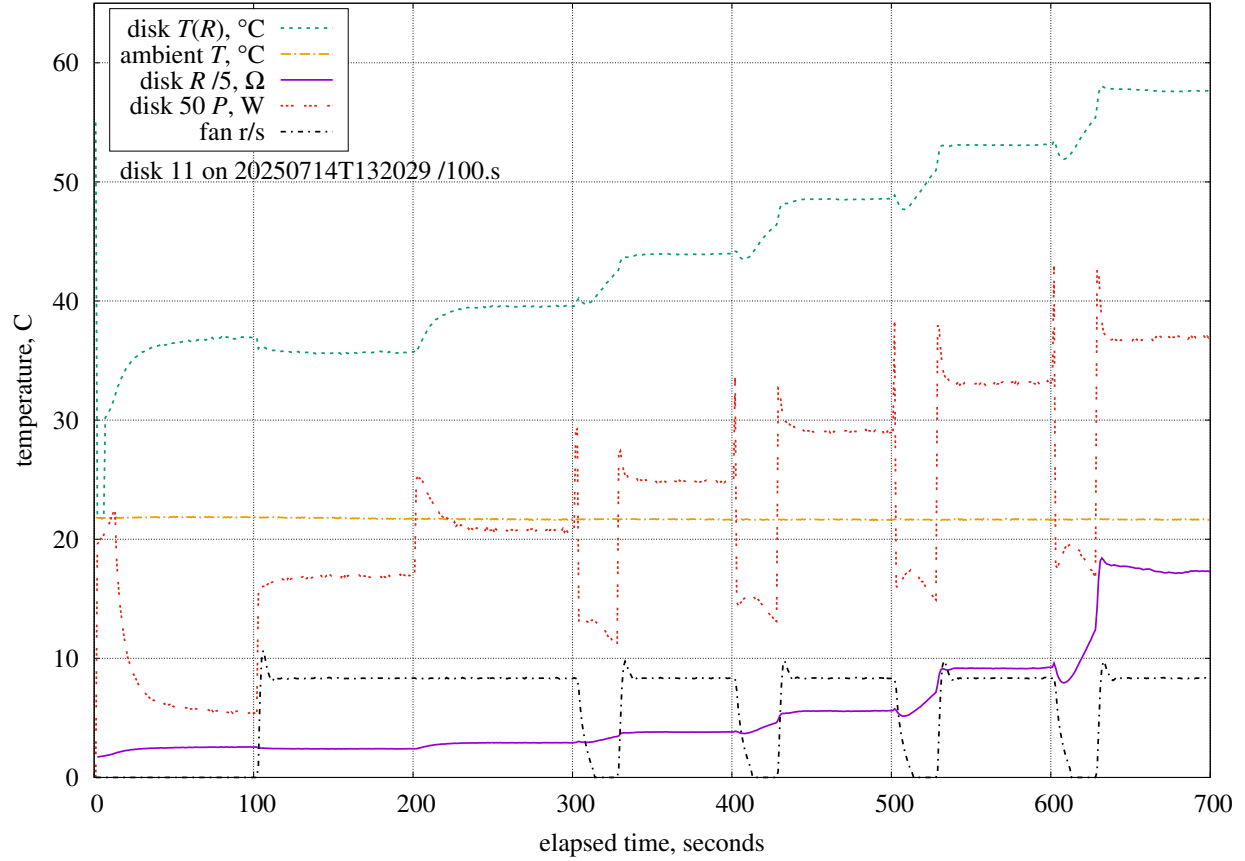
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
ΔT	25.0.K	+3.95%/K	0.10.K	0.40%	LM35C differential
P	101.kPa	+0.0004%/Pa	1.5.kPa	0.64%	MPXH6115A6U air pressure
η	0.340	+116%	0.007	0.79%	anemometer calibration
Re_0	600	-0.0056%	60	0.33%	integration lower-bound
D_o	2.81.mm	-8018%/m	500.um	4.01%	tube outer diameter
D_i	1.11.mm	+13519%/m	200.um	2.70%	tube inner diameter
D_g	166.um	-495%/m	750.um	0.37%	tube air gap
L_{wire}	38.0.mm	+2063%/m	500.um	1.03%	wire length
k_{ABS}	179. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	+0.187%/ $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	9.0. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	1.67%	ABS thermal conductivity
d	12.0.mm	+4006%/m	100.um	0.40%	disk diameter
ϵ_{ABS}	0.920	-37.2%	0.010	0.37%	ABS emissivity
ϵ_{wt}	0.900	-37.6%	0.025	0.94%	wind-tunnel emissivity
θ	50.0.m $^\circ$	+8.27%/°	0.20.°	1.65%	plate angle
ψ	50.0.m $^\circ$	-2263108%/°	0.25.°	565776.90%	flow angle
				565776.90%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	126.r/min	+0.311%/(r/min)	1.1.r/min	0.34%	fan rotation rate
				565776.90%	RSS combined uncertainty



$\theta = 0.0^\circ$; $\psi = 0.0^\circ$; $V = 0.748 \text{ m/s}$ (250 r/min)

Estimated measurement uncertainties at $Re = 546$.

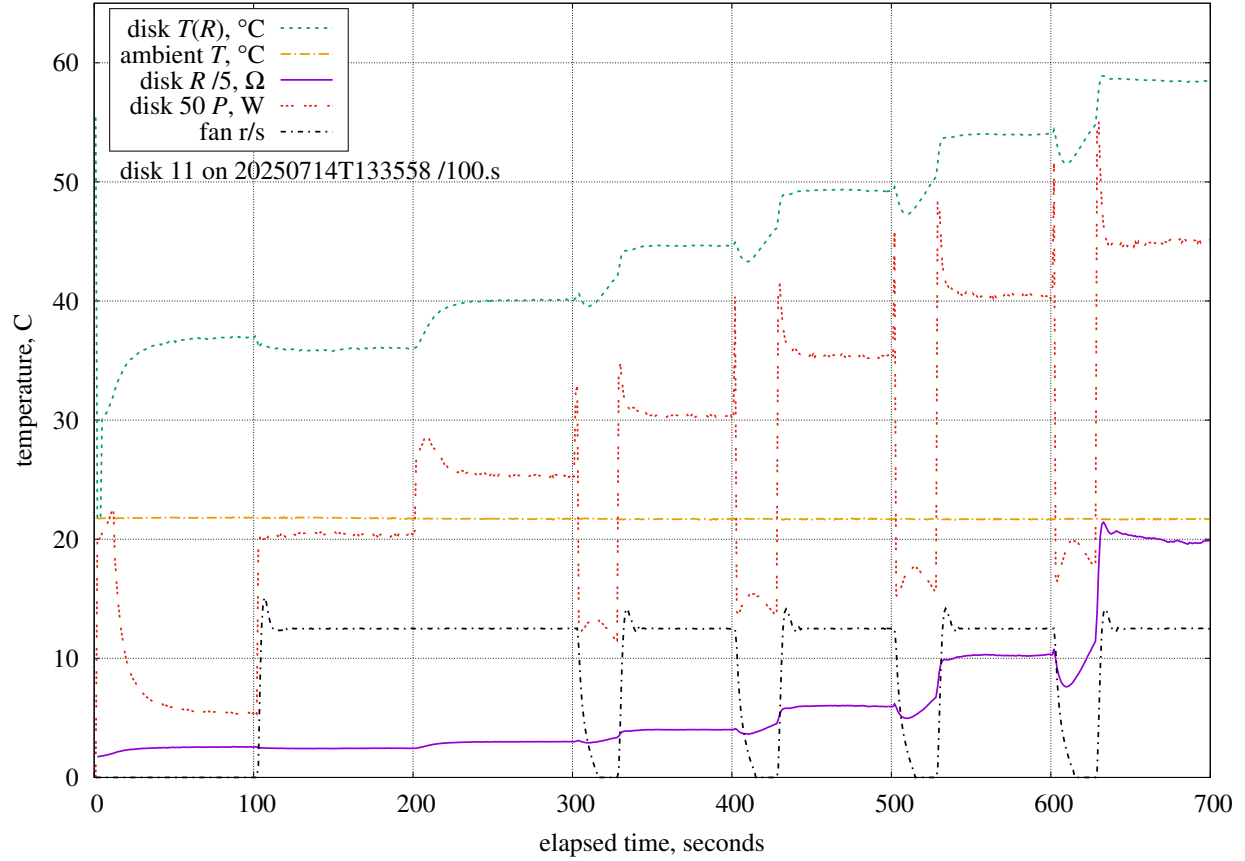
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
ΔT	25.0.K	+3.87%/K	0.10.K	0.39%	LM35C differential
P	101.kPa	+0.0004%/Pa	1.5.kPa	0.62%	MPXH6115A6U air pressure
η	0.340	+114%	0.007	0.78%	anemometer calibration
Re_0	600	-0.0064%	60	0.38%	integration lower-bound
D_o	2.81.mm	-10809%/m	500.um	5.40%	tube outer diameter
D_i	1.11.mm	+17208%/m	200.um	3.44%	tube inner diameter
D_g	166.um	-630%/m	750.um	0.47%	tube air gap
L_{wire}	38.0.mm	+2626%/m	500.um	1.31%	wire length
k_{ABS}	179. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	+0.205%/ $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	9.0. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	1.83%	ABS thermal conductivity
d	12.0.mm	+4157%/m	100.um	0.42%	disk diameter
ϵ_{ABS}	0.920	-38.5%	0.010	0.38%	ABS emissivity
ϵ_{wt}	0.900	-39.0%	0.025	0.98%	wind-tunnel emissivity
θ	50.0.m°	+6.09%/°	0.20.°	1.22%	plate angle
ψ	50.0.m°	-1880917%/°	0.25.°	470229.29%	flow angle
				470229.29%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	250.r/min	+0.155%/(r/min)	1.0.r/min	0.16%	fan rotation rate
				470229.29%	RSS combined uncertainty



$\theta = 0.0^\circ$; $\psi = 0.0^\circ$; $V = 1.466 \text{ m/s}$ (500 r/min)

Estimated measurement uncertainties at $Re = 1070$.

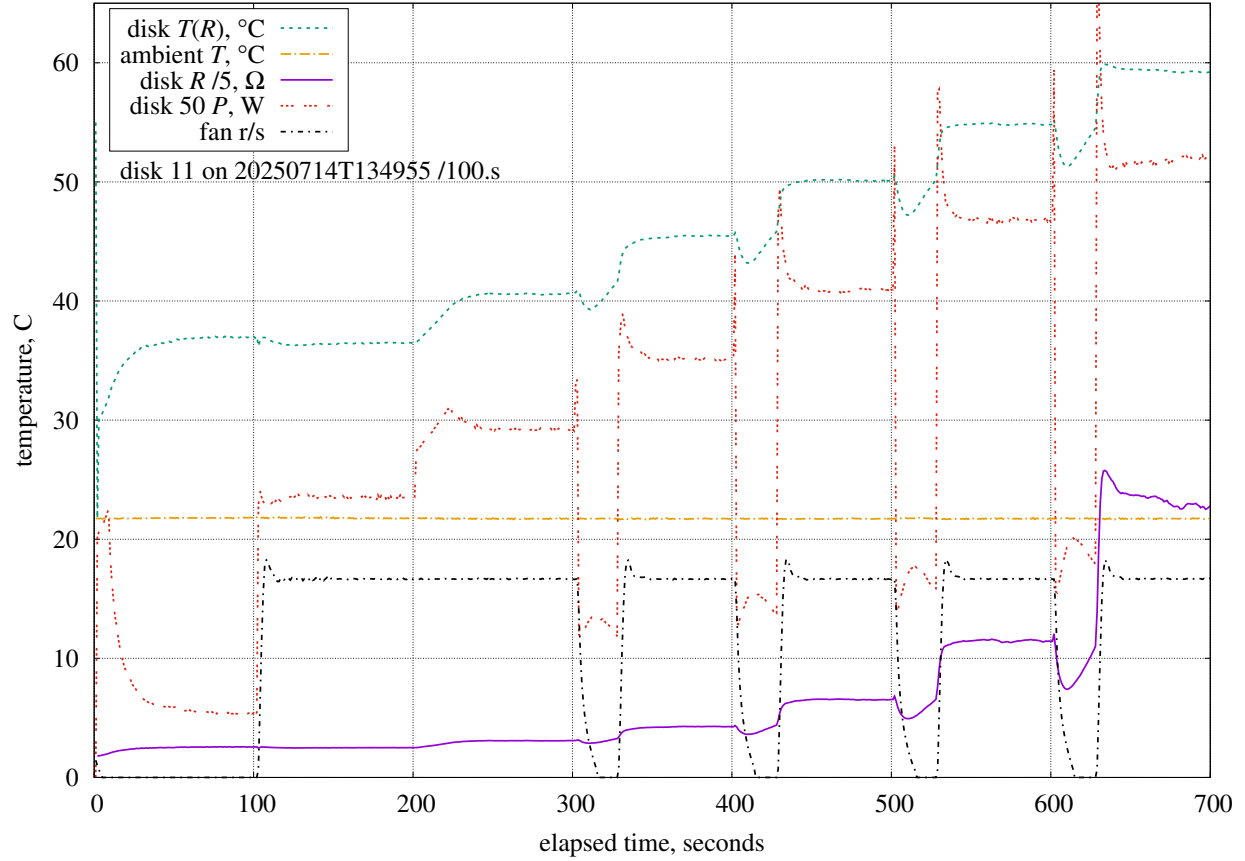
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	307.K	$-0.408\%/K$	0.50.K	0.20%	LM35C temperature sensor
ΔT	25.0.K	$+3.74\%/K$	0.10.K	0.37%	LM35C differential
P	101.kPa	$+0.0004\%/Pa$	1.5.kPa	0.63%	MPXH6115A6U air pressure
η	0.340	$+115\%$	0.007	0.78%	anemometer calibration
Re_0	600	-0.0089%	60	0.53%	integration lower-bound
D_o	2.81.mm	$-13672\%/m$	500.um	6.84%	tube outer diameter
D_i	1.11.mm	$+20625\%/m$	200.um	4.13%	tube inner diameter
D_g	166.um	$-771\%/m$	750.um	0.58%	tube air gap
L_{wire}	38.0.mm	$+3212\%/m$	500.um	1.61%	wire length
k_{ABS}	$179. \frac{\text{mW}}{\text{K}\cdot\text{m}}$	$+0.218\%/ \frac{\text{mW}}{\text{K}\cdot\text{m}}$	$9.0. \frac{\text{mW}}{\text{K}\cdot\text{m}}$	1.95%	ABS thermal conductivity
d	12.0.mm	$+4616\%/m$	100.um	0.46%	disk diameter
ϵ_{ABS}	0.920	-39.3%	0.010	0.39%	ABS emissivity
ϵ_{wt}	0.900	-39.9%	0.025	1.00%	wind-tunnel emissivity
θ	$50.0.\text{m}^\circ$	$+4.48\%/^\circ$	$0.20.^\circ$	0.90%	plate angle
ψ	$50.0.\text{m}^\circ$	$-1505605\%/^\circ$	$0.25.^\circ$	376401.32%	flow angle
				376401.32%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	500.r/min	$+0.078\%/(r/min)$	1.4.r/min	0.11%	fan rotation rate
				376401.32%	RSS combined uncertainty



$\theta = 0.0^\circ$; $\psi = 0.0^\circ$; $V = 2.131 \text{ m/s}$ (750 r/min)

Estimated measurement uncertainties at $Re = 1555$.

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	307.K	$-0.414\%/K$	0.50.K	0.21%	LM35C temperature sensor
ΔT	25.0.K	$+3.66\%/K$	0.10.K	0.37%	LM35C differential
P	101.kPa	$+0.0004\%/Pa$	1.5.kPa	0.62%	MPXH6115A6U air pressure
η	0.340	$+108\%$	0.007	0.73%	anemometer calibration
Re_0	600	-0.0096%	60	0.57%	integration lower-bound
D_o	2.81.mm	$-15201\%/m$	500.um	7.60%	tube outer diameter
D_i	1.11.mm	$+22177\%/m$	200.um	4.44%	tube inner diameter
D_g	166.um	$-846\%/m$	750.um	0.63%	tube air gap
L_{wire}	38.0.mm	$+3526\%/m$	500.um	1.76%	wire length
k_{ABS}	$179. \frac{\text{mW}}{\text{K}\cdot\text{m}}$	$+0.222\%/ \frac{\text{mW}}{\text{K}\cdot\text{m}}$	$9.0. \frac{\text{mW}}{\text{K}\cdot\text{m}}$	1.99%	ABS thermal conductivity
d	12.0.mm	$+4949\%/m$	100.um	0.49%	disk diameter
ϵ_{ABS}	0.920	-39.6%	0.010	0.40%	ABS emissivity
ϵ_{wt}	0.900	-40.3%	0.025	1.01%	wind-tunnel emissivity
θ	$50.0.m^\circ$	$+3.77\%/^\circ$	$0.20.^\circ$	0.75%	plate angle
ψ	$50.0.m^\circ$	$-1309603\%/^\circ$	$0.25.^\circ$	327400.71%	flow angle
				327400.71%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	750.r/min	$+0.049\%/(r/min)$	0.82.r/min	0.04%	fan rotation rate
				327400.71%	RSS combined uncertainty



$\theta = 0.0^\circ$; $\psi = 0.0^\circ$; $V = 2.724 \text{ m/s}$ (999 r/min)

Estimated measurement uncertainties at $Re = 1988$.

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	307.K	$-0.420\%/K$	0.50.K	0.21%	LM35C temperature sensor
ΔT	25.0.K	$+3.60\%/K$	0.10.K	0.36%	LM35C differential
P	101.kPa	$+0.0004\%/Pa$	1.5.kPa	0.61%	MPXH6115A6U air pressure
η	0.340	$+98.5\%$	0.007	0.67%	anemometer calibration
Re_0	600	-0.0097%	60	0.58%	integration lower-bound
D_o	2.81.mm	$-16266\%/m$	500.um	8.13%	tube outer diameter
D_i	1.11.mm	$+23050\%/m$	200.um	4.61%	tube inner diameter
D_g	166.um	$-897\%/m$	750.um	0.67%	tube air gap
L_{wire}	38.0.mm	$+3740\%/m$	500.um	1.87%	wire length
k_{ABS}	$179. \frac{\text{mW}}{\text{K}\cdot\text{m}}$	$+0.224\%/ \frac{\text{mW}}{\text{K}\cdot\text{m}}$	$9.0. \frac{\text{mW}}{\text{K}\cdot\text{m}}$	2.00%	ABS thermal conductivity
d	12.0.mm	$+5171\%/m$	100.um	0.52%	disk diameter
ϵ_{ABS}	0.920	-40.2%	0.010	0.40%	ABS emissivity
ϵ_{wt}	0.900	-40.9%	0.025	1.02%	wind-tunnel emissivity
θ	$50.0.m^\circ$	$+3.36\%/^\circ$	$0.20.^\circ$	0.67%	plate angle
ψ	$50.0.m^\circ$	$-1191447\%/^\circ$	$0.25.^\circ$	297861.76%	flow angle
				297861.76%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	999.r/min	$+0.033\%/(r/min)$	1.8.r/min	0.06%	fan rotation rate
				297861.76%	RSS combined uncertainty