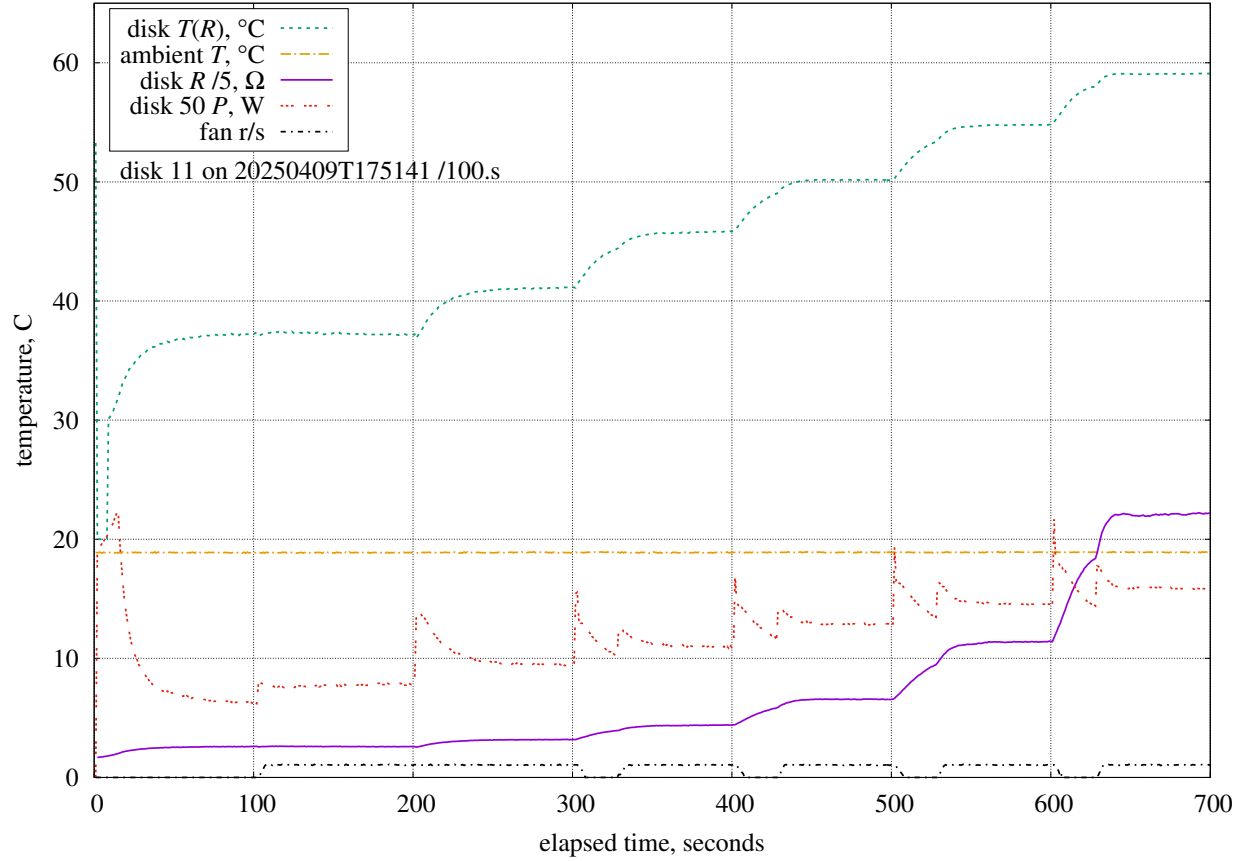


$\theta = 7.4^\circ$; $\psi = 90.0^\circ$; $V = 0.000 \text{ m/s}$ (0 r/min)

Estimated measurement uncertainties of natural convection at $\theta = 7.4$.

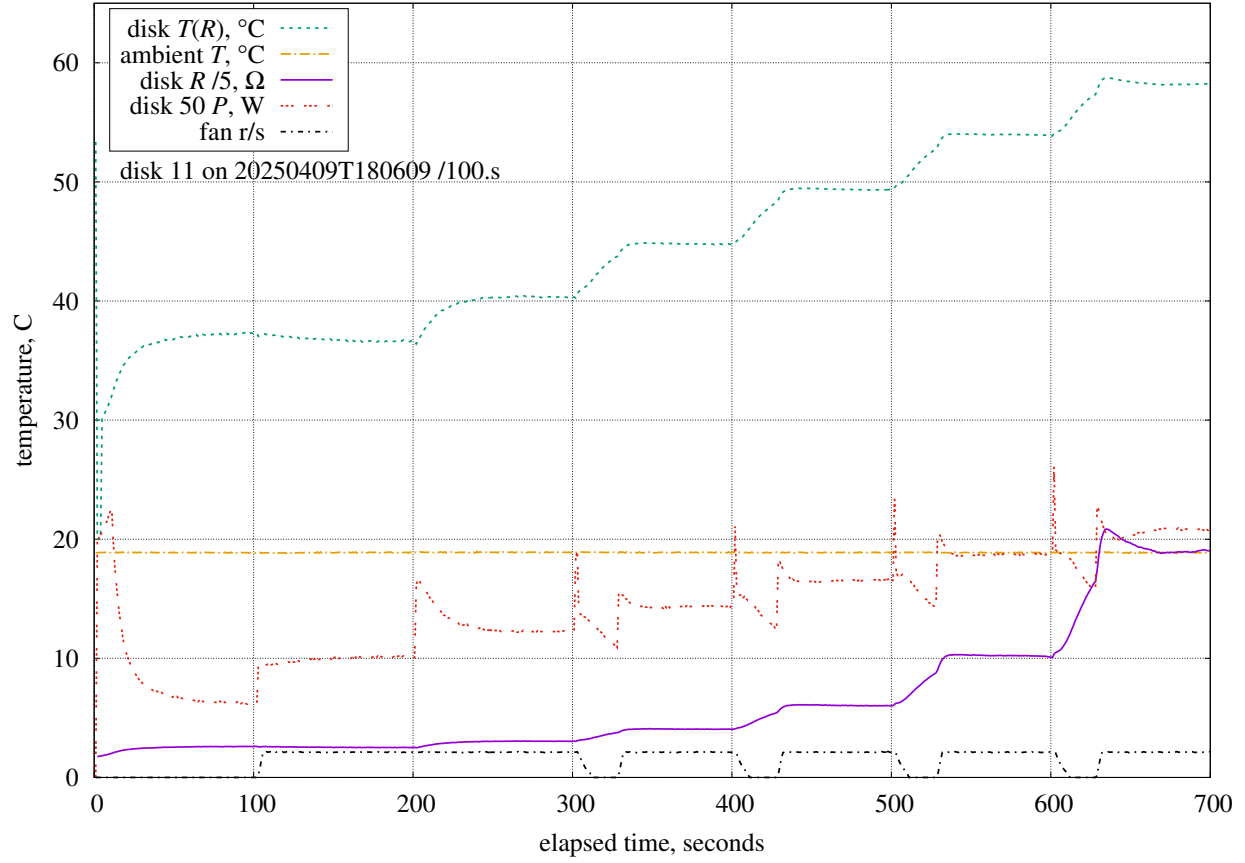
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
ΔT	25.0.K	+4.21%/K	0.10.K	0.42%	LM35C differential
P	101.kPa	+0.0001%/Pa	1.5.kPa	0.21%	MPXH6115A6U air pressure
D_o	2.81.mm	+2337%/m	500.um	1.17%	tube outer diameter
D_i	1.11.mm	+8543%/m	200.um	1.71%	tube inner diameter
D_g	166.um	-337%/m	750.um	0.25%	tube air gap
L_{wire}	38.0.mm	+1404%/m	500.um	0.70%	wire length
k_{ABS}	179. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	+0.164%/ $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	9.0. $\frac{\text{mW}}{\text{K}\cdot\text{m}}$	1.47%	ABS thermal conductivity
d	12.0.mm	+2948%/m	100.um	0.29%	disk diameter
				2.70%	combined bias uncertainty



$\theta = 7.4^\circ$; $\psi = 90.0^\circ$; $V = 0.190$ m/s (63 r/min)

Estimated measurement uncertainties at $Re = 141$.

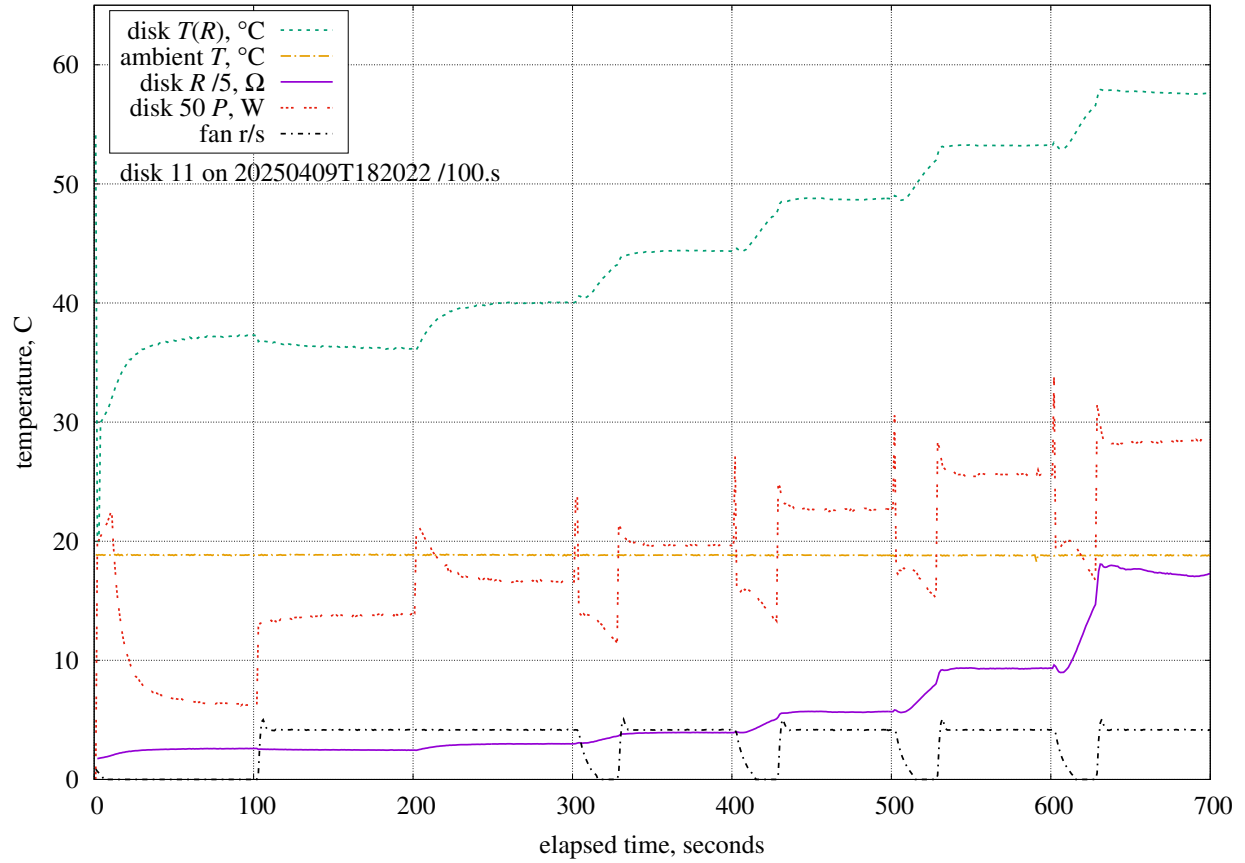
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
ΔT	25.0.K	+4.01%/K	0.10.K	0.40%	LM35C differential
P	101.kPa	+0.0004%/Pa	1.5.kPa	0.65%	MPXH6115A6U air pressure
η	0.340	+111%	0.007	0.75%	anemometer calibration
Re_0	600	-0.0055%	60	0.33%	integration lower-bound
D_o	2.81.mm	-5990%/m	500.um	2.99%	tube outer diameter
D_i	1.11.mm	+10223%/m	200.um	2.04%	tube inner diameter
D_g	166.um	-314%/m	750.um	0.24%	tube air gap
L_{wire}	38.0.mm	+1310%/m	500.um	0.65%	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	+4093%/m	100.um	0.41%	disk diameter
ϵ_{ABS}	0.920	-36.6%	0.010	0.37%	ABS emissivity
ϵ_{wt}	0.900	-36.8%	0.025	0.92%	wind-tunnel emissivity
				4.29%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	63.1.r/min	+0.598%/(r/min)	1.4.r/min	0.81%	fan rotation rate
				4.59%	RSS combined uncertainty



$\theta = 7.4^\circ$; $\psi = 90.0^\circ$; $V = 0.383 \text{ m/s}$ (127 r/min)

Estimated measurement uncertainties at $Re = 285$.

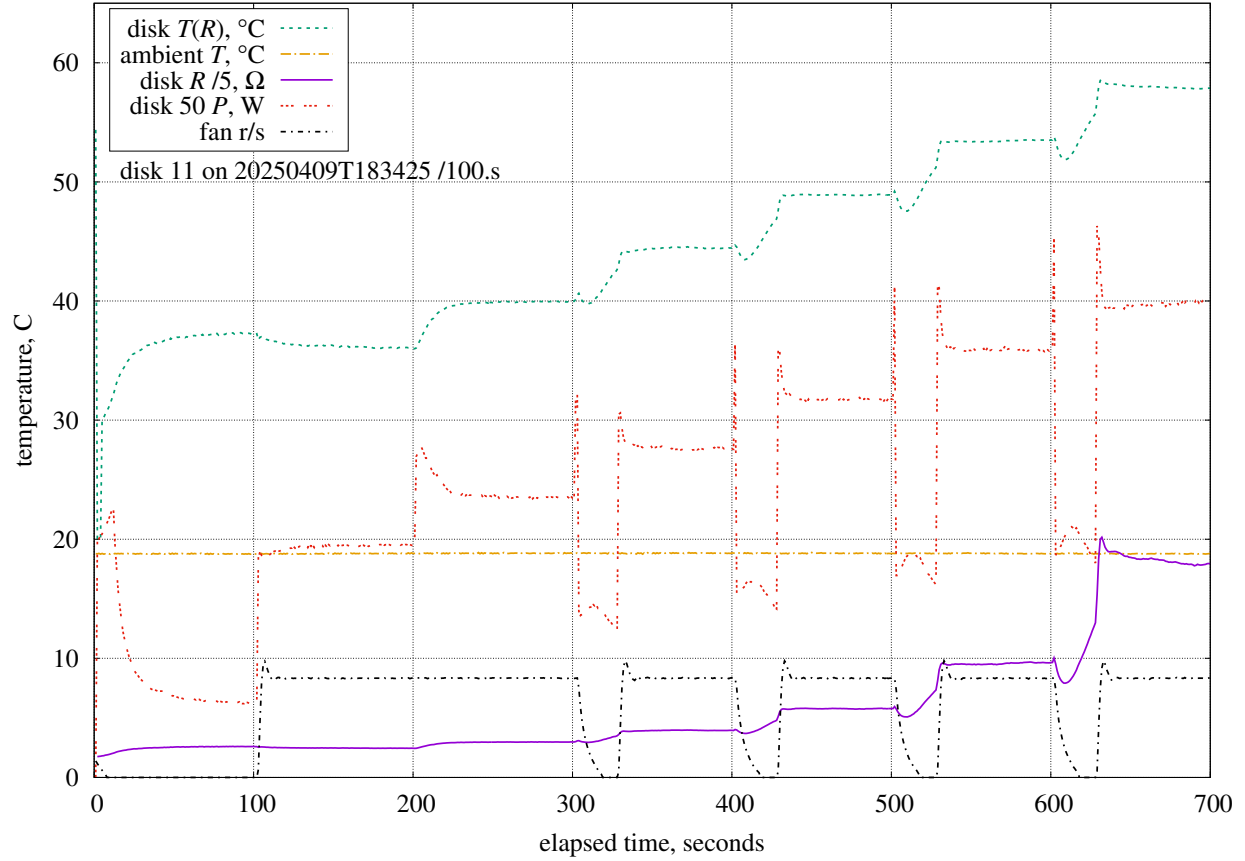
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	305.K	$-0.447\%/K$	0.50.K	0.22%	LM35C temperature sensor
ΔT	25.0.K	$+3.89\%/K$	0.10.K	0.39%	LM35C differential
P	101.kPa	$+0.0005\%/Pa$	1.5.kPa	0.70%	MPXH6115A6U air pressure
η	0.340	$+129\%$	0.007	0.88%	anemometer calibration
Re_0	600	-0.0077%	60	0.46%	integration lower-bound
D_o	2.81.mm	$-9791\%/m$	500.um	4.90%	tube outer diameter
D_i	1.11.mm	$+14501\%/m$	200.um	2.90%	tube inner diameter
D_g	166.um	$-426\%/m$	750.um	0.32%	tube air gap
L_{wire}	38.0.mm	$+1774\%/m$	500.um	0.89%	wire length
k_{ABS}	$179. \frac{\text{mW}}{\text{K}\cdot\text{m}}$	$+0.195\%/\frac{\text{mW}}{\text{K}\cdot\text{m}}$	$9.0. \frac{\text{mW}}{\text{K}\cdot\text{m}}$	1.74%	ABS thermal conductivity
d	12.0.mm	$+4137\%/m$	100.um	0.41%	disk diameter
ϵ_{ABS}	0.920	-43.5%	0.010	0.43%	ABS emissivity
ϵ_{wt}	0.900	-44.0%	0.025	1.10%	wind-tunnel emissivity
				6.29%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	127.r/min	$+0.344\%/(r/min)$	1.1.r/min	0.39%	fan rotation rate
				6.34%	RSS combined uncertainty



$\theta = 7.4^\circ$; $\psi = 90.0^\circ$; $V = 0.748$ m/s (250 r/min)

Estimated measurement uncertainties at $Re = 556$.

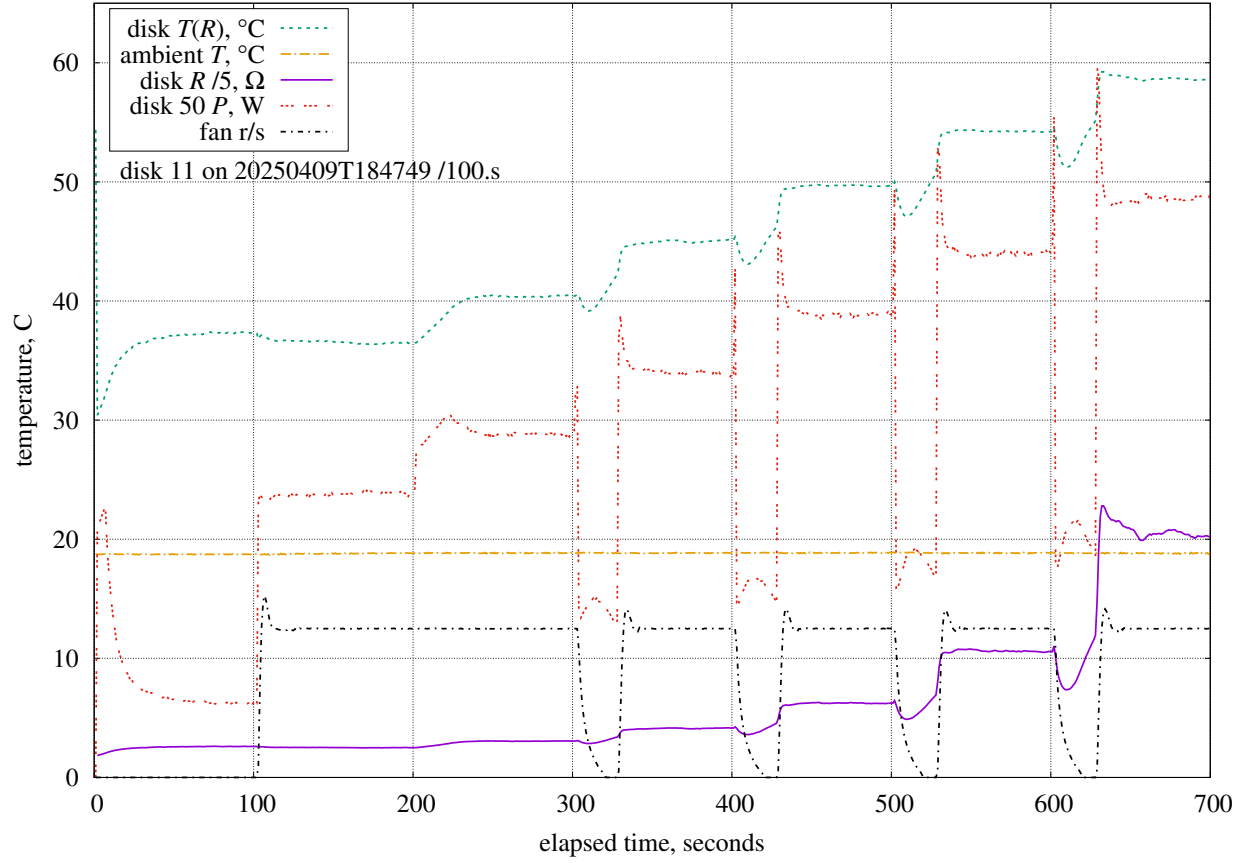
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	304.K	$-0.474\%/K$	0.50.K	0.24%	LM35C temperature sensor
ΔT	25.0.K	$+3.76\%/K$	0.10.K	0.38%	LM35C differential
P	101.kPa	$+0.0005\%/Pa$	1.5.kPa	0.70%	MPXH6115A6U air pressure
η	0.340	$+132\%$	0.007	0.90%	anemometer calibration
Re_0	600	-0.0094%	60	0.56%	integration lower-bound
D_o	2.81.mm	$-13118\%/m$	500.um	6.56%	tube outer diameter
D_i	1.11.mm	$+18658\%/m$	200.um	3.73%	tube inner diameter
D_g	166.um	$-557\%/m$	750.um	0.42%	tube air gap
L_{wire}	38.0.mm	$+2321\%/m$	500.um	1.16%	wire length
k_{ABS}	179. $\frac{mW}{K \cdot m}$	$+0.214\%/ \frac{mW}{K \cdot m}$	9.0. $\frac{mW}{K \cdot m}$	1.92%	ABS thermal conductivity
d	12.0.mm	$+4385\%/m$	100.um	0.44%	disk diameter
ϵ_{ABS}	0.920	-45.6%	0.010	0.46%	ABS emissivity
ϵ_{wt}	0.900	-46.3%	0.025	1.16%	wind-tunnel emissivity
				8.11%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	250.r/min	$+0.179\%/(r/min)$	1.2.r/min	0.22%	fan rotation rate
				8.12%	RSS combined uncertainty



$\theta = 7.4^\circ$; $\psi = 90.0^\circ$; $V = 1.467 \text{ m/s}$ (500 r/min)

Estimated measurement uncertainties at $Re = 1091$.

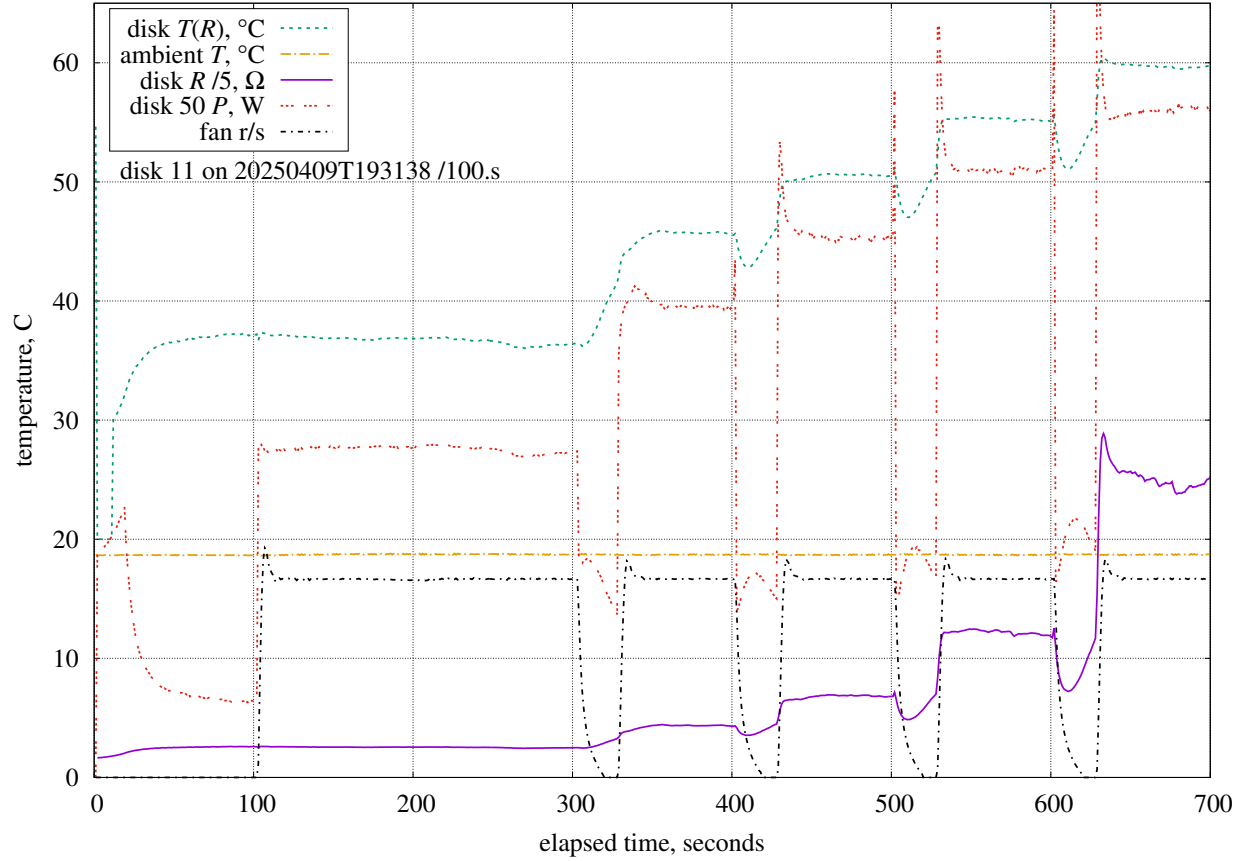
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	304.K	$-0.493\%/K$	0.50.K	0.25%	LM35C temperature sensor
ΔT	25.0.K	$+3.58\%/K$	0.10.K	0.36%	LM35C differential
P	101.kPa	$+0.0004\%/Pa$	1.5.kPa	0.67%	MPXH6115A6U air pressure
η	0.340	$+125\%$	0.007	0.85%	anemometer calibration
Re_0	600	-0.010%	60	0.62%	integration lower-bound
D_o	2.81.mm	$-16612\%/m$	500.um	8.31%	tube outer diameter
D_i	1.11.mm	$+22399\%/m$	200.um	4.48%	tube inner diameter
D_g	166.um	$-708\%/m$	750.um	0.53%	tube air gap
L_{wire}	38.0.mm	$+2952\%/m$	500.um	1.48%	wire length
k_{ABS}	$179. \frac{\text{mW}}{\text{K}\cdot\text{m}}$	$+0.229\%/ \frac{\text{mW}}{\text{K}\cdot\text{m}}$	$9.0. \frac{\text{mW}}{\text{K}\cdot\text{m}}$	2.05%	ABS thermal conductivity
d	12.0.mm	$+4796\%/m$	100.um	0.48%	disk diameter
ϵ_{ABS}	0.920	-47.4%	0.010	0.47%	ABS emissivity
ϵ_{wt}	0.900	-48.2%	0.025	1.21%	wind-tunnel emissivity
				9.97%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	500.r/min	$+0.085\%/(r/min)$	1.7.r/min	0.15%	fan rotation rate
				9.97%	RSS combined uncertainty



$\theta = 7.4^\circ$; $\psi = 90.0^\circ$; $V = 2.130$ m/s (750 r/min)

Estimated measurement uncertainties at $Re = 1583$.

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	304.K	$-0.511\%/K$	0.50.K	0.26%	LM35C temperature sensor
ΔT	25.0.K	$+3.44\%/K$	0.10.K	0.34%	LM35C differential
P	101.kPa	$+0.0004\%/Pa$	1.5.kPa	0.65%	MPXH6115A6U air pressure
η	0.340	$+115\%$	0.007	0.78%	anemometer calibration
Re_0	600	-0.011%	60	0.63%	integration lower-bound
D_o	2.81.mm	$-18808\%/m$	500.um	9.40%	tube outer diameter
D_i	1.11.mm	$+24133\%/m$	200.um	4.83%	tube inner diameter
D_g	166.um	$-803\%/m$	750.um	0.60%	tube air gap
L_{wire}	38.0.mm	$+3349\%/m$	500.um	1.67%	wire length
k_{ABS}	179. $\frac{mW}{K \cdot m}$	$+0.234\%/ \frac{mW}{K \cdot m}$	9.0. $\frac{mW}{K \cdot m}$	2.10%	ABS thermal conductivity
d	12.0.mm	$+5056\%/m$	100.um	0.51%	disk diameter
ϵ_{ABS}	0.920	-49.4%	0.010	0.49%	ABS emissivity
ϵ_{wt}	0.900	-50.3%	0.025	1.26%	wind-tunnel emissivity
				11.09%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	750.r/min	$+0.052\%/(r/min)$	0.79.r/min	0.04%	fan rotation rate
				11.09%	RSS combined uncertainty



$\theta = 7.4^\circ$; $\psi = 90.0^\circ$; $V = 2.725$ m/s (1000 r/min)

Estimated measurement uncertainties at $Re = 2026$.

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
T	304.K	$-0.552\%/K$	0.50.K	0.28%	LM35C temperature sensor
ΔT	25.0.K	$+3.22\%/K$	0.10.K	0.32%	LM35C differential
P	101.kPa	$+0.0004\%/Pa$	1.5.kPa	0.64%	MPXH6115A6U air pressure
η	0.340	$+104\%$	0.007	0.70%	anemometer calibration
Re_0	600	-0.010%	60	0.62%	integration lower-bound
D_o	2.81.mm	$-21293\%/m$	500.um	10.65%	tube outer diameter
D_i	1.11.mm	$+25194\%/m$	200.um	5.04%	tube inner diameter
D_g	166.um	$-894\%/m$	750.um	0.67%	tube air gap
L_{wire}	38.0.mm	$+3728\%/m$	500.um	1.86%	wire length
k_{ABS}	179. $\frac{mW}{K \cdot m}$	$+0.237\%/ \frac{mW}{K \cdot m}$	9.0. $\frac{mW}{K \cdot m}$	2.12%	ABS thermal conductivity
d	12.0.mm	$+5180\%/m$	100.um	0.52%	disk diameter
ϵ_{ABS}	0.920	-54.1%	0.010	0.54%	ABS emissivity
ϵ_{wt}	0.900	-55.1%	0.025	1.38%	wind-tunnel emissivity
				12.29%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
ω	1000.r/min	$+0.035\%/(r/min)$	1.8.r/min	0.06%	fan rotation rate
				12.29%	RSS combined uncertainty