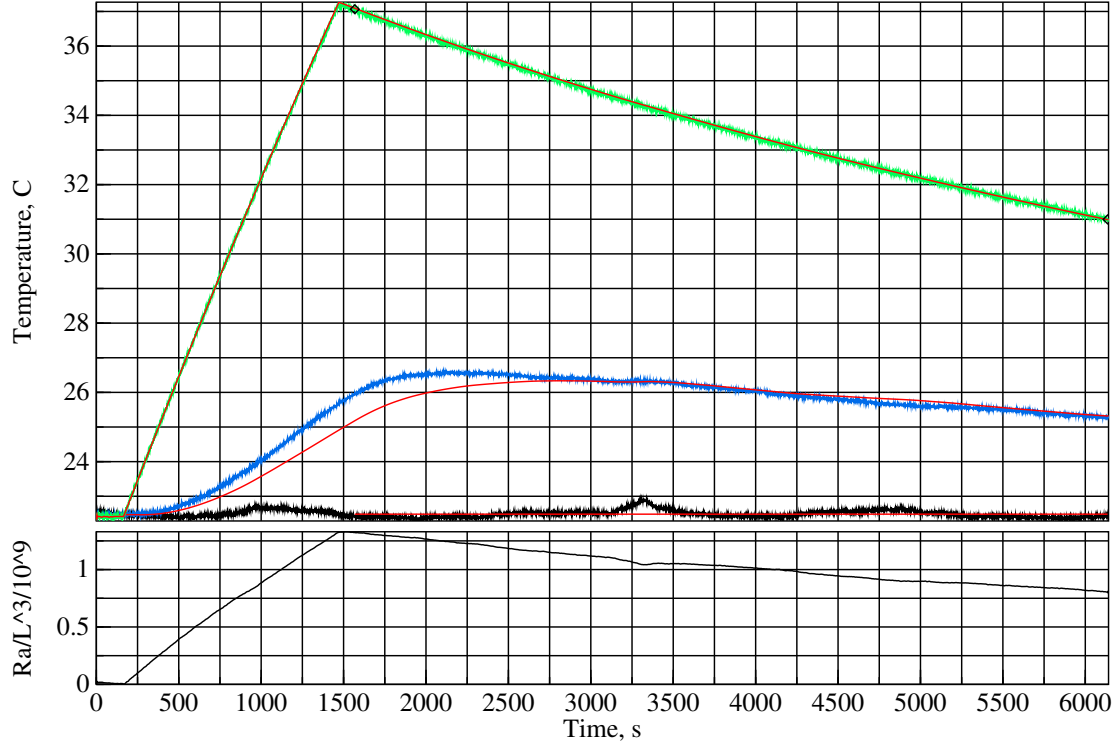
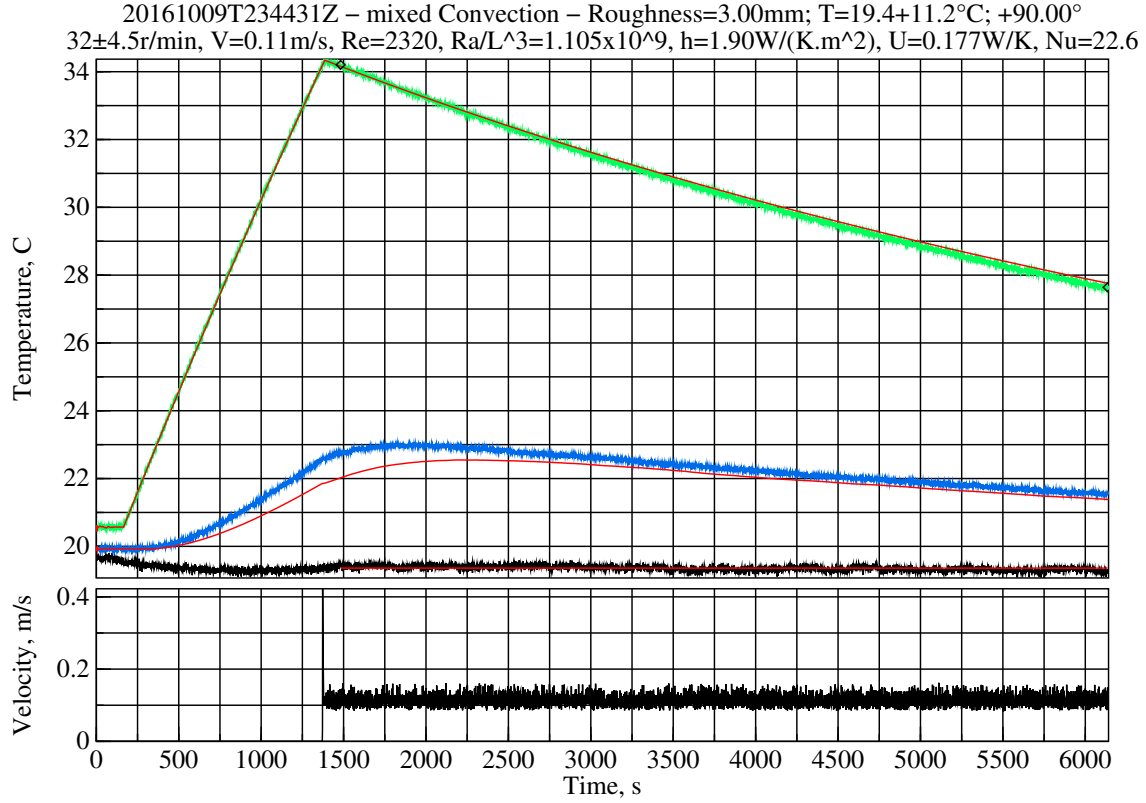


20160806T225914Z – mixed Convection – Roughness=3.00mm; T=22.5+11.2°C; +90.00°  
k=0.0258, Ra/L^3=1.034x10^9, h=1.57W/(K.m^2), U=0.146W/K, Nu=18.6, Pr=0.710



Estimated measurement uncertainties of natural convection at  $\theta = 90.0$ .

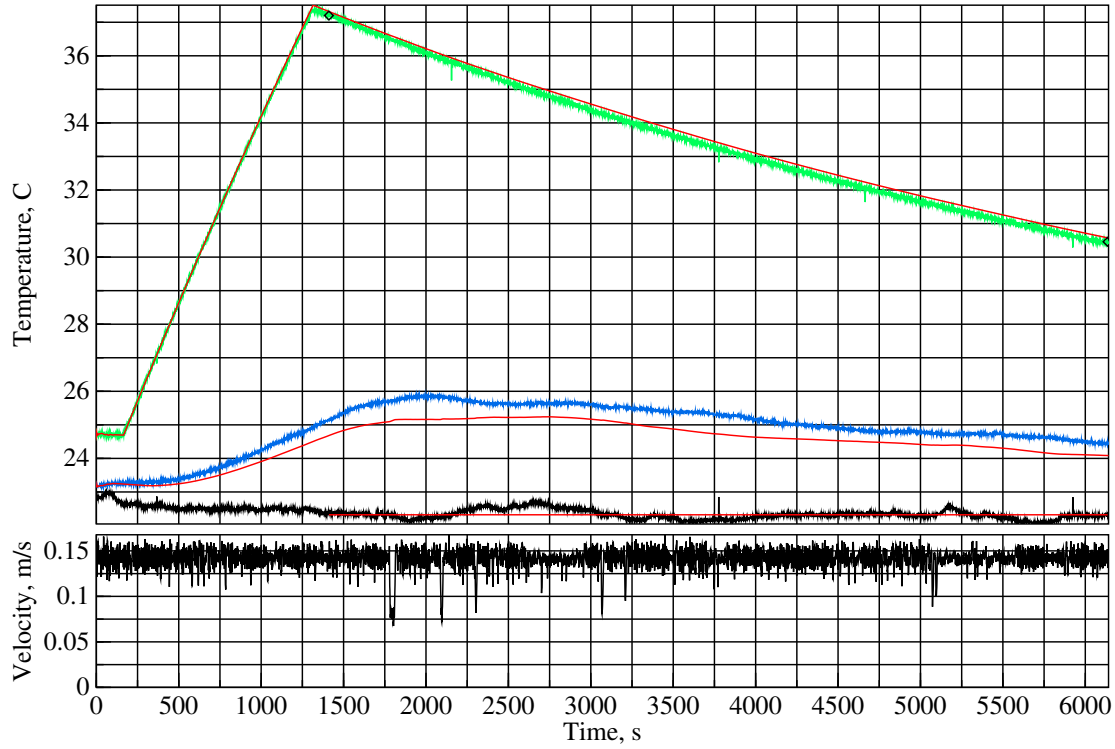
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$T$	301K	+0.636%/K	0.50K	0.32%	LM35C temperature sensor
$\Delta T$	11.2K	+37.0%/K	0.10K	3.70%	LM35C differential
$T_{bb}$	296K	+0.713%/K	0.50K	0.36%	radiative temperature
$P$	99.7kPa	+0.0009%/Pa	1.5kPa	1.28%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.079%/(J/K)	47J/K	3.72%	plate thermal capacity
$L_c$	0.305m	+1139%/m	500um	0.57%	characteristic length
$L_w$	0.305m	+402%/m	500um	0.20%	plate width
$D_{PIR}$	25.4mm	-898%/m	1.0mm	0.90%	insulation thickness
$D_g$	1.00mm	-911%/m	500um	0.46%	air gap
$L_m$	3.57mm	+2628%/m	500um	1.31%	side metal strip width
$k_{PIR}$	22.2 $\frac{mW}{K \cdot m}$	+0.868%/ $\frac{mW}{K \cdot m}$	1.1 $\frac{mW}{K \cdot m}$	0.96%	PIR thermal conductivity
$\epsilon_{XPS}$	0.515	+79.7%	0.010	0.80%	XPS emissivity
$\epsilon_{tp}$	0.890	+96.2%	0.015	1.44%	tape emissivity
$\Omega_{tp}$	0.540	+64.9%	0.020	1.30%	tape coverage
$\epsilon_{rs}$	0.040	+347%	0.010	3.47%	test-surface emissivity
$\epsilon_b$	0.190	+22.7%	0.020	0.45%	back emissivity
$\epsilon_{wt}$	0.900	+161%	0.025	4.02%	wind-tunnel emissivity
$\theta$	90.0°	-1.05%/°	0.50°	0.53%	plate angle
				8.16%	combined bias uncertainty



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 2319$ .

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$T$	298K	+0.419%/K	0.50K	0.21%	LM35C temperature sensor
$\Delta T$	11.2K	+34.1%/K	0.10K	3.41%	LM35C differential
$T_{bb}$	292K	+0.619%/K	0.50K	0.31%	radiative temperature
$P$	101kPa	+0.0011%/Pa	1.5kPa	1.62%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.074%/(J/K)	47J/K	3.47%	plate thermal capacity
$\eta$	0.401	+114%	0.014	1.60%	anemometer calibration
$L_c$	0.305m	+990%/m	500um	0.49%	characteristic length
$\varsigma$	6.00mm	+2862%/m	100um	0.29%	post height
$D_{PIR}$	25.4mm	−958%/m	1.0mm	0.96%	insulation thickness
$D_g$	1.00mm	−972%/m	500um	0.49%	air gap
$L_m$	3.57mm	+2446%/m	500um	1.22%	side metal strip width
$k_{PIR}$	22.2 $\frac{mW}{K \cdot m}$	+0.939%/ $\frac{mW}{K \cdot m}$	1.1 $\frac{mW}{K \cdot m}$	1.04%	PIR thermal conductivity
$k_{XPS}$	28.5 $\frac{mW}{K \cdot m}$	+0.159%/ $\frac{mW}{K \cdot m}$	1.4 $\frac{mW}{K \cdot m}$	0.23%	XPS thermal conductivity
$\epsilon_{XPS}$	0.515	+69.3%	0.010	0.69%	XPS emissivity
$\epsilon_{tp}$	0.890	+83.9%	0.015	1.26%	tape emissivity
$\Omega_{tp}$	0.540	+56.5%	0.020	1.13%	tape coverage
$\epsilon_{rs}$	0.040	+305%	0.010	3.05%	test-surface emissivity
$\epsilon_b$	0.190	+10.6%	0.020	0.21%	back emissivity
$\epsilon_{wt}$	0.900	+138%	0.025	3.46%	wind-tunnel emissivity
$\theta$	90.0°	+5.45%/°	0.50°	2.73%	plate angle
				8.08%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	32.0r/min	+1.43%/(r/min)	4.5r/min	6.46%	fan rotation rate
				15.25%	RSS combined uncertainty

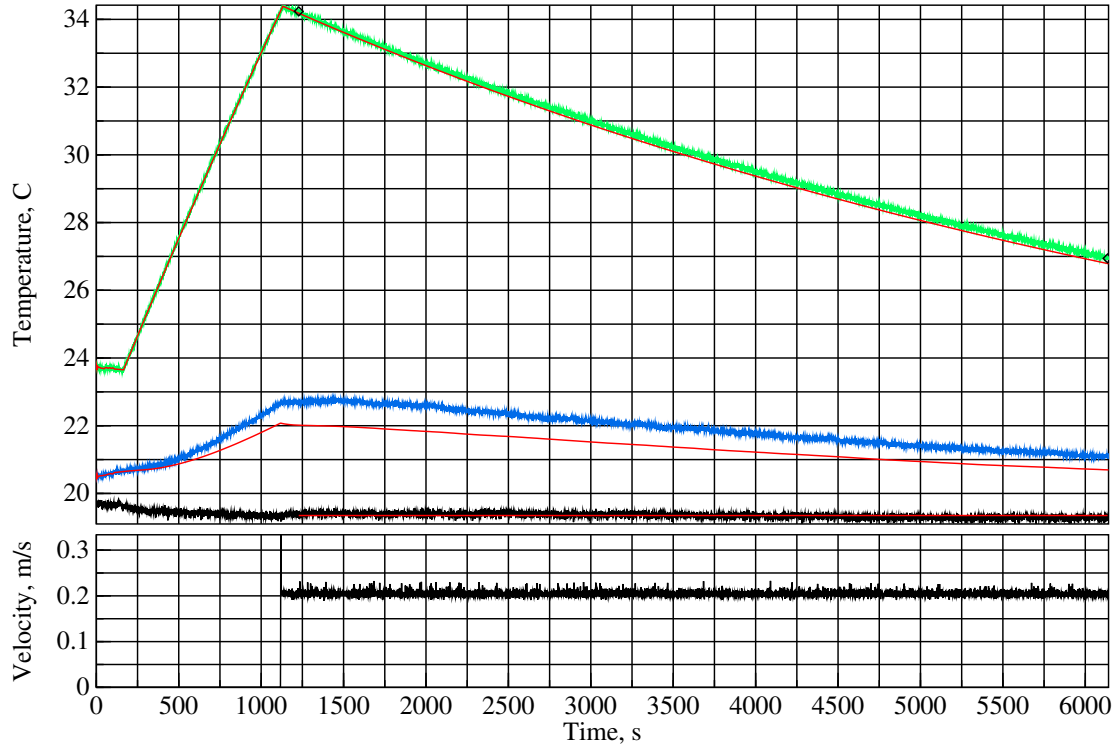
20160806T172853Z – mixed Convection – Roughness=3.00mm; T=22.3+11.1°C; +90.00°  
40±3.0r/min, V=0.14m/s, Re=2791, Ra/L^3=1.026x10^9, h=2.05W/(K.m^2), U=0.191W/K, Nu=24.3



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 2791$ .

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	11.1K	+31.9%/K	0.10K	3.19%	LM35C differential
$T_{bb}$	296K	+0.572%/K	0.50K	0.29%	radiative temperature
$P$	99.7kPa	+0.0012%/Pa	1.5kPa	1.83%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.070%/(J/K)	47J/K	3.27%	plate thermal capacity
$\eta$	0.401	+183%	0.014	2.57%	anemometer calibration
$L_c$	0.305m	+886%/m	500um	0.44%	characteristic length
$\varsigma$	6.00mm	+4899%/m	100um	0.49%	post height
$D_{PIR}$	25.4mm	−916%/m	1.0mm	0.92%	insulation thickness
$D_g$	1.00mm	−929%/m	500um	0.46%	air gap
$L_m$	3.57mm	+2298%/m	500um	1.15%	side metal strip width
$k_{PIR}$	22.2 $\frac{mW}{K \cdot m}$	+0.900%/ $\frac{mW}{K \cdot m}$	1.1 $\frac{mW}{K \cdot m}$	1.00%	PIR thermal conductivity
$k_{XPS}$	28.5 $\frac{mW}{K \cdot m}$	+0.157%/ $\frac{mW}{K \cdot m}$	1.4 $\frac{mW}{K \cdot m}$	0.22%	XPS thermal conductivity
$\epsilon_{XPS}$	0.515	+65.0%	0.010	0.65%	XPS emissivity
$\epsilon_{tp}$	0.890	+78.6%	0.015	1.18%	tape emissivity
$\Omega_{tp}$	0.540	+53.0%	0.020	1.06%	tape coverage
$\epsilon_{rs}$	0.040	+284%	0.010	2.84%	test-surface emissivity
$\epsilon_{wt}$	0.900	+129%	0.025	3.23%	wind-tunnel emissivity
$\theta$	90.0°	+12.3%/°	0.50°	6.13%	plate angle
				9.68%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	39.7r/min	+1.85%/(r/min)	3.0r/min	5.63%	fan rotation rate
				14.85%	RSS combined uncertainty

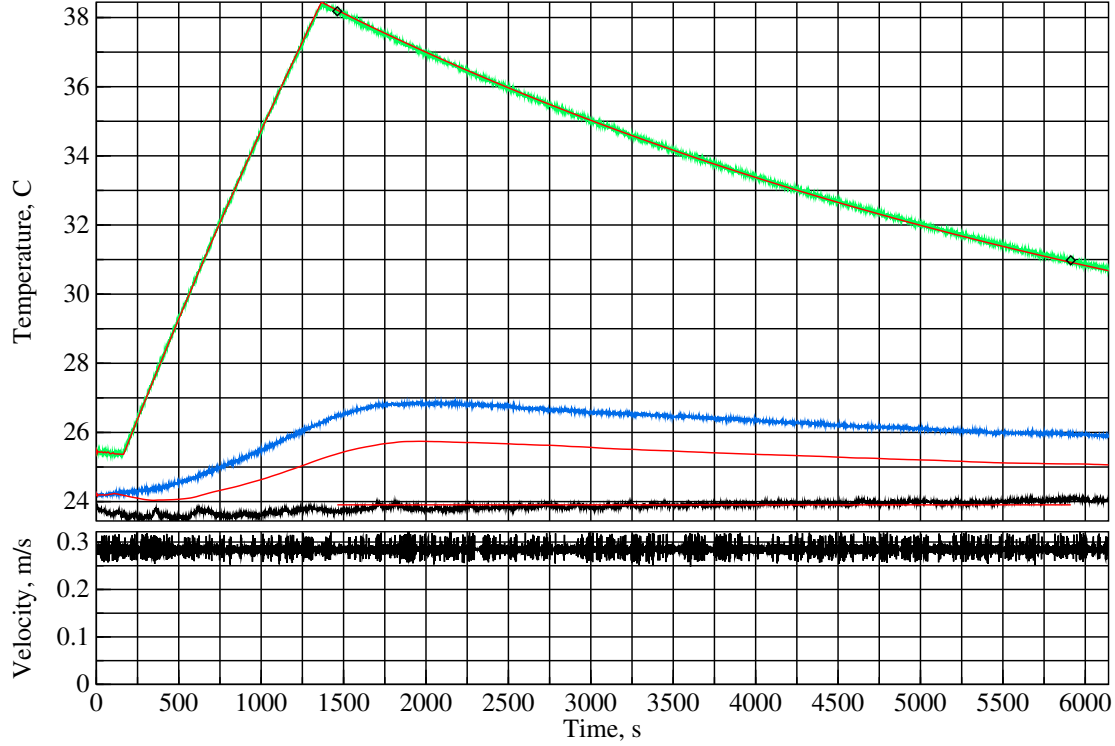
20161009T004717Z – mixed Convection – Roughness=3.00mm; T=19.3+10.8°C; +90.00°  
58±1.5r/min, V=0.20m/s, Re=4167, Ra/L^3=1.069x10^9, h=2.49W/(K.m^2), U=0.232W/K, Nu=29.7



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 4168$ .

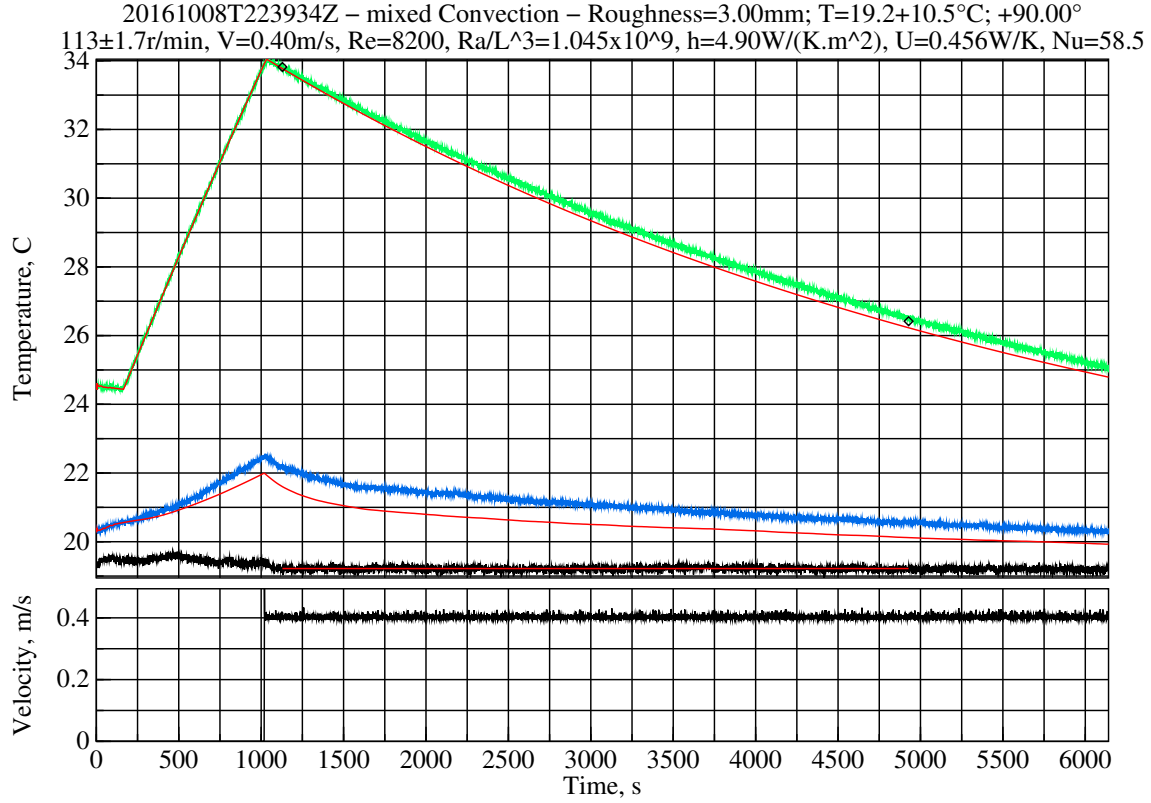
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	10.8K	+25.8%/K	0.10K	2.58%	LM35C differential
$P$	101kPa	+0.0012%/Pa	1.5kPa	1.86%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.056%/(J/K)	47J/K	2.62%	plate thermal capacity
$\eta$	0.401	+242%	0.014	3.39%	anemometer calibration
$L_c$	0.305m	+655%/m	500um	0.33%	characteristic length
$\varsigma$	6.00mm	+6689%/m	100um	0.67%	post height
$D_{PIR}$	25.4mm	−722%/m	1.0mm	0.72%	insulation thickness
$D_g$	1.00mm	−733%/m	500um	0.37%	air gap
$L_m$	3.57mm	+1675%/m	500um	0.84%	side metal strip width
$k_{PIR}$	22.2 $\frac{mW}{K \cdot m}$	+0.713%/ $\frac{mW}{K \cdot m}$	1.1 $\frac{mW}{K \cdot m}$	0.79%	PIR thermal conductivity
$\epsilon_{XPS}$	0.515	+44.9%	0.010	0.45%	XPS emissivity
$\epsilon_{tp}$	0.890	+54.3%	0.015	0.81%	tape emissivity
$\Omega_{tp}$	0.540	+36.6%	0.020	0.73%	tape coverage
$\epsilon_{rs}$	0.040	+197%	0.010	1.97%	test-surface emissivity
$\epsilon_{wt}$	0.900	+88.8%	0.025	2.22%	wind-tunnel emissivity
$\theta$	90.0°	+10.6%/°	0.50°	5.28%	plate angle
				8.32%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	57.6r/min	+1.68%/(r/min)	1.5r/min	2.55%	fan rotation rate
				9.76%	RSS combined uncertainty

20160807T035725Z – mixed Convection – Roughness=3.00mm; T=23.9+10.2°C; +90.00°  
80±3.6r/min, V=0.28m/s, Re=5588, Ra/L^3=0.927x10^9, h=3.55W/(K.m^2), U=0.331W/K, Nu=41.9



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 5588$ .

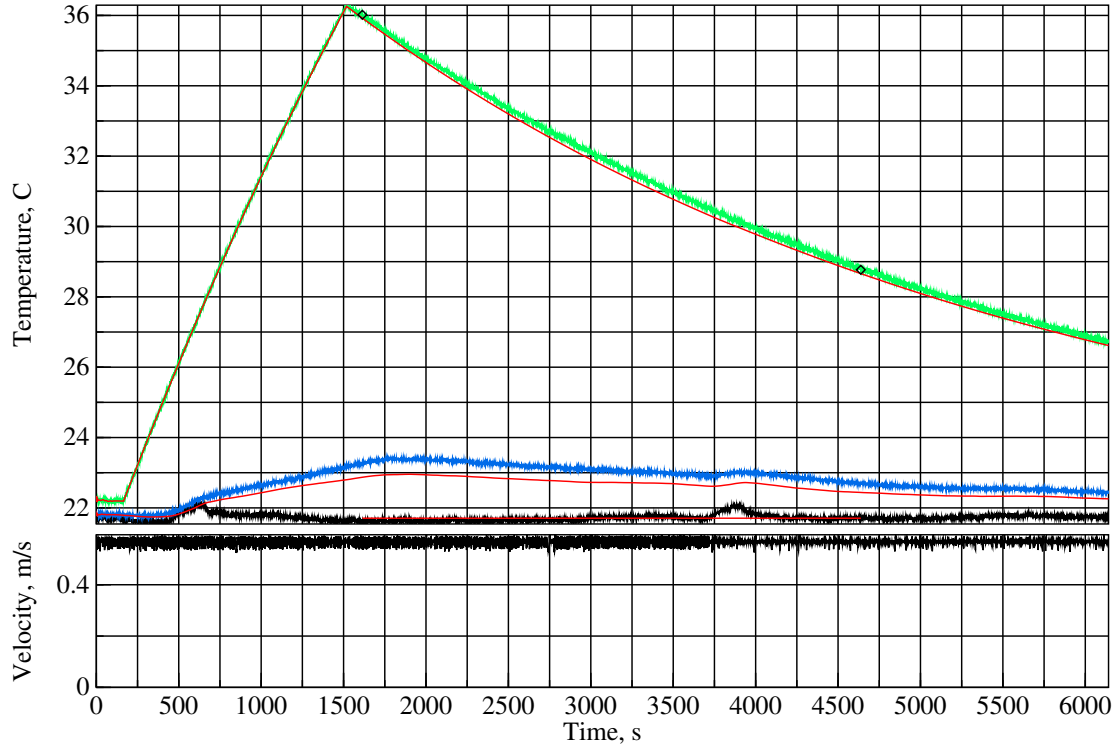
Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	10.2K	+23.1%/K	0.10K	2.31%	LM35C differential
$P$	99.9kPa	+0.0012%/Pa	1.5kPa	1.80%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.048%/(J/K)	47J/K	2.24%	plate thermal capacity
$\eta$	0.401	+250%	0.014	3.51%	anemometer calibration
$L_c$	0.305m	+536%/m	500um	0.27%	characteristic length
$\varsigma$	6.00mm	+7008%/m	100um	0.70%	post height
$D_{PIR}$	25.4mm	−576%/m	1.0mm	0.58%	insulation thickness
$D_g$	1.00mm	−584%/m	500um	0.29%	air gap
$L_m$	3.57mm	+1348%/m	500um	0.67%	side metal strip width
$k_{PIR}$	22.2 $\frac{mW}{K \cdot m}$	+0.571%/ $\frac{mW}{K \cdot m}$	1.1 $\frac{mW}{K \cdot m}$	0.63%	PIR thermal conductivity
$\epsilon_{XPS}$	0.515	+35.3%	0.010	0.35%	XPS emissivity
$\epsilon_{tp}$	0.890	+42.6%	0.015	0.64%	tape emissivity
$\Omega_{tp}$	0.540	+28.7%	0.020	0.57%	tape coverage
$\epsilon_{rs}$	0.040	+153%	0.010	1.53%	test-surface emissivity
$\epsilon_{wt}$	0.900	+69.5%	0.025	1.74%	wind-tunnel emissivity
$\theta$	90.0°	+5.61%/°	0.50°	2.80%	plate angle
				6.48%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	80.1r/min	+1.25%/(r/min)	3.6r/min	4.45%	fan rotation rate
				11.01%	RSS combined uncertainty



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 8200$ .

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	10.5K	+18.5%/K	0.10K	1.85%	LM35C differential
$P$	101kPa	+0.0011%/Pa	1.5kPa	1.70%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.039%/(J/K)	47J/K	1.85%	plate thermal capacity
$\eta$	0.401	+251%	0.014	3.53%	anemometer calibration
$L_c$	0.305m	+422%/m	500um	0.21%	characteristic length
$\varsigma$	6.00mm	+7107%/m	100um	0.71%	post height
$D_{PIR}$	25.4mm	−425%/m	1.0mm	0.43%	insulation thickness
$D_g$	1.00mm	−431%/m	500um	0.22%	air gap
$L_m$	3.57mm	+972%/m	500um	0.49%	side metal strip width
$k_{PIR}$	22.2 $\frac{mW}{K \cdot m}$	+0.424%/ $\frac{mW}{K \cdot m}$	1.1 $\frac{mW}{K \cdot m}$	0.47%	PIR thermal conductivity
$\epsilon_{XPS}$	0.515	+23.1%	0.010	0.23%	XPS emissivity
$\epsilon_{tp}$	0.890	+28.0%	0.015	0.42%	tape emissivity
$\Omega_{tp}$	0.540	+18.9%	0.020	0.38%	tape coverage
$\epsilon_{rs}$	0.040	+102%	0.010	1.02%	test-surface emissivity
$\epsilon_{wt}$	0.900	+45.6%	0.025	1.14%	wind-tunnel emissivity
$\theta$	90.0°	+2.64%/°	0.50°	1.32%	plate angle
				5.28%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	113r/min	+0.890%/(r/min)	1.7r/min	1.49%	fan rotation rate
				6.07%	RSS combined uncertainty

20160809T115735Z – mixed Convection – Roughness=3.00mm; T=21.7+10.3°C; +90.00°  
160±3.8r/min, V=0.57m/s, Re=11458, Ra/L^3=0.997x10^9, h=7.20W/(K.m^2), U=0.670W/K, Nu=85.4

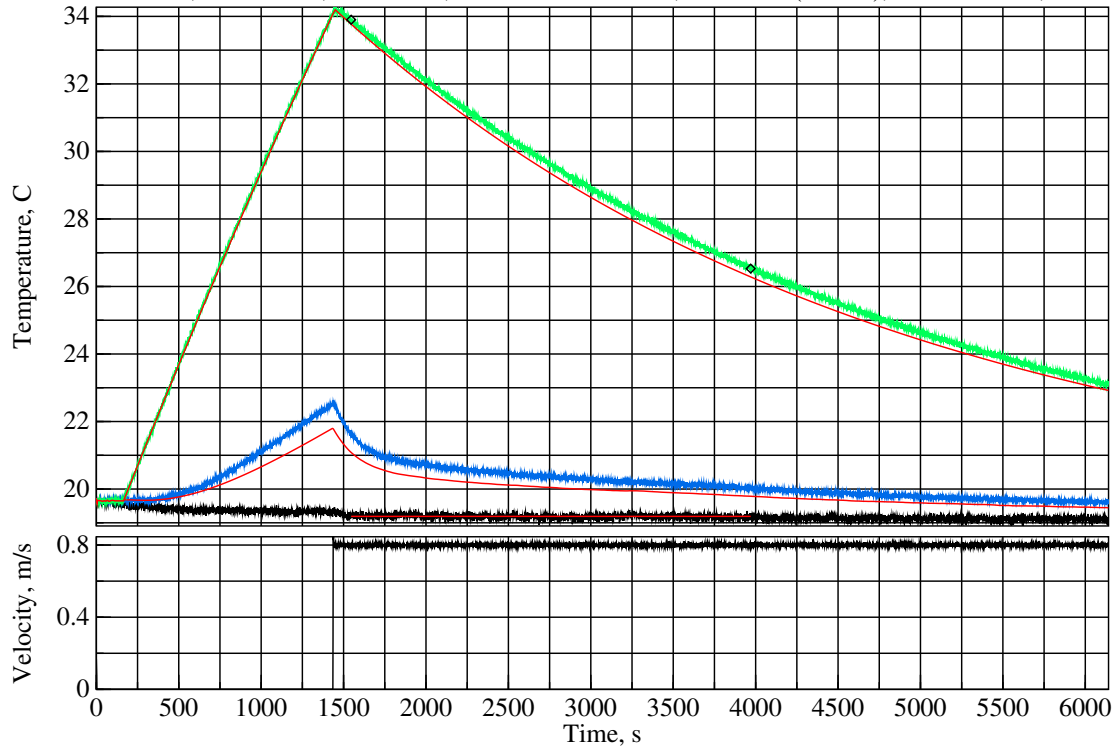


Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 11457$ .

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	10.3K	+16.4%/K	0.10K	1.64%	LM35C differential
$P$	101kPa	+0.0011%/Pa	1.5kPa	1.63%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.034%/(J/K)	47J/K	1.62%	plate thermal capacity
$\eta$	0.401	+250%	0.014	3.52%	anemometer calibration
$\varsigma$	6.00mm	+7133%/m	100um	0.71%	post height
$D_{PIR}$	25.4mm	-318%/m	1.0mm	0.32%	insulation thickness
$L_m$	3.57mm	+766%/m	500um	0.38%	side metal strip width
$k_{PIR}$	22.2 $\frac{mW}{K \cdot m}$	+0.318%/ $\frac{mW}{K \cdot m}$	1.1 $\frac{mW}{K \cdot m}$	0.35%	PIR thermal conductivity
$\epsilon_{tp}$	0.890	+20.5%	0.015	0.31%	tape emissivity
$\Omega_{tp}$	0.540	+13.8%	0.020	0.28%	tape coverage
$\epsilon_{rs}$	0.040	+74.3%	0.010	0.74%	test-surface emissivity
$\epsilon_{wt}$	0.900	+33.3%	0.025	0.83%	wind-tunnel emissivity
$\theta$	90.0°	+1.23%/°	0.50°	0.62%	plate angle
				4.81%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	160r/min	+0.628%/(r/min)	3.8r/min	2.36%	fan rotation rate
				6.73%	RSS combined uncertainty



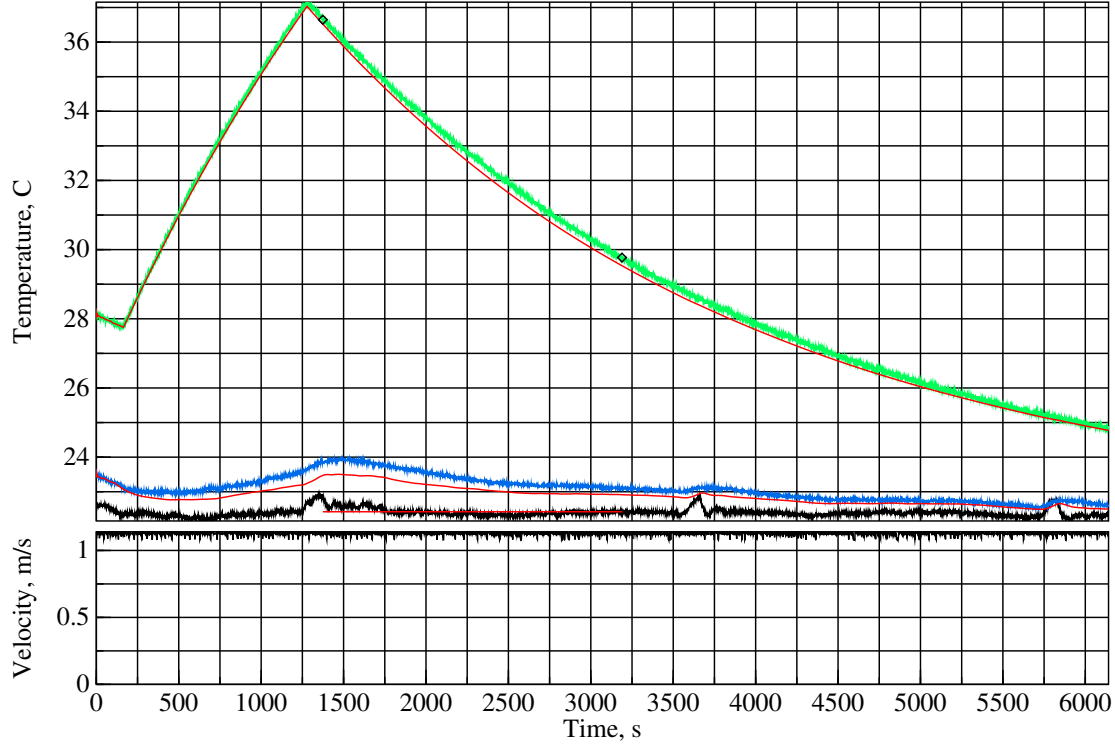
20161009T193743Z – mixed Convection – Roughness=3.00mm; T=19.2+10.6°C; +90.00°  
226±1.5r/min, V=0.80m/s, Re=16302, Ra/L^3=1.055x10^9, h=9.91W/(K.m^2), U=0.922W/K, Nu=118.2



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 16304$ .

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	10.6K	+14.0%/K	0.10K	1.40%	LM35C differential
$P$	101kPa	+0.0011%/Pa	1.5kPa	1.60%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.031%/(J/K)	47J/K	1.44%	plate thermal capacity
$\eta$	0.401	+249%	0.014	3.49%	anemometer calibration
$\varsigma$	6.00mm	+7145%/m	100um	0.71%	post height
$D_{PIR}$	25.4mm	-234%/m	1.0mm	0.23%	insulation thickness
$L_m$	3.57mm	+597%/m	500um	0.30%	side metal strip width
$k_{PIR}$	22.2 $\frac{mW}{K \cdot m}$	+0.236%/ $\frac{mW}{K \cdot m}$	1.1 $\frac{mW}{K \cdot m}$	0.26%	PIR thermal conductivity
$\epsilon_{tp}$	0.890	+14.1%	0.015	0.21%	tape emissivity
$\epsilon_{rs}$	0.040	+51.4%	0.010	0.51%	test-surface emissivity
$\epsilon_{wt}$	0.900	+22.9%	0.025	0.57%	wind-tunnel emissivity
$\theta$	90.0°	+0.575%/°	0.50°	0.29%	plate angle
				4.51%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	226r/min	+0.442%/(r/min)	1.5r/min	0.67%	fan rotation rate
				4.71%	RSS combined uncertainty

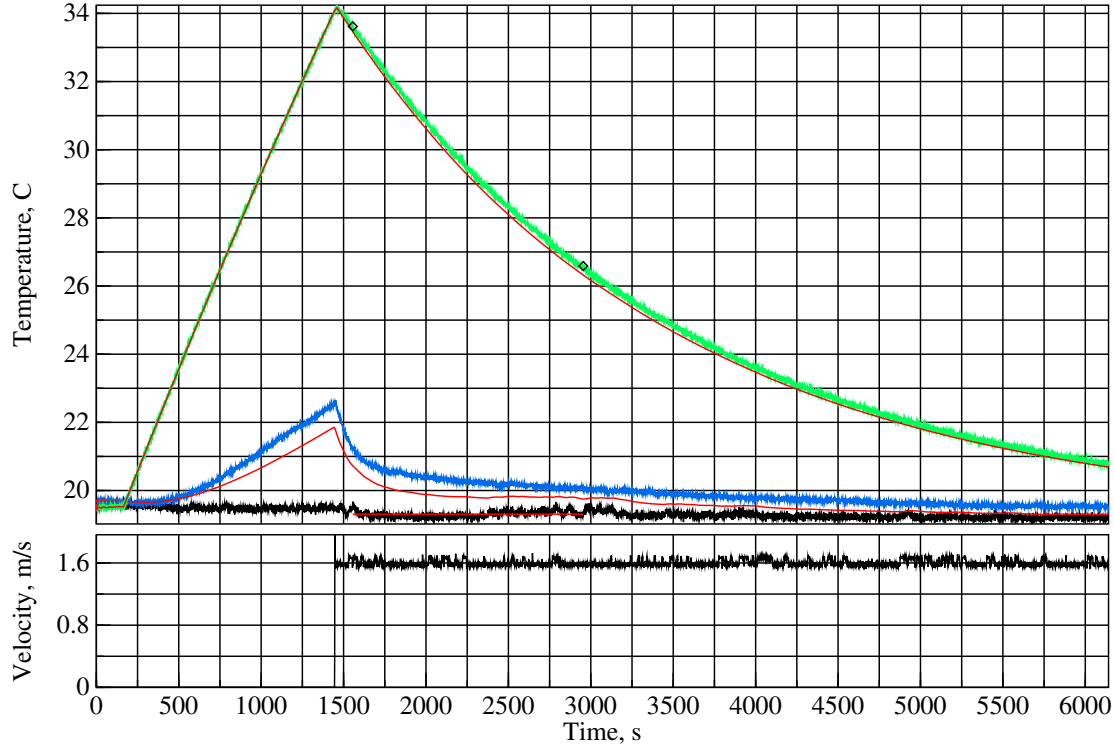
20160806T195314Z – mixed Convection – Roughness=3.00mm; T=22.4+10.4°C; +90.00°  
320±2.8r/min, V=1.1m/s, Re=22213, Ra/L^3=0.965x10^9, h=13.7W/(K.m^2), U=1.28W/K, Nu=162.7



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 22213$ .

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	10.4K	+13.1%/K	0.10K	1.31%	LM35C differential
$P$	99.5kPa	+0.0011%/Pa	1.5kPa	1.59%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.028%/(J/K)	47J/K	1.32%	plate thermal capacity
$\eta$	0.401	+245%	0.014	3.44%	anemometer calibration
$\varsigma$	6.00mm	+7203%/m	100um	0.72%	post height
$L_m$	3.57mm	+502%/m	500um	0.25%	side metal strip width
$\epsilon_{rs}$	0.040	+38.6%	0.010	0.39%	test-surface emissivity
$\epsilon_{wt}$	0.900	+17.2%	0.025	0.43%	wind-tunnel emissivity
				4.35%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	320r/min	+0.308%/(r/min)	2.8r/min	0.85%	fan rotation rate
				4.68%	RSS combined uncertainty

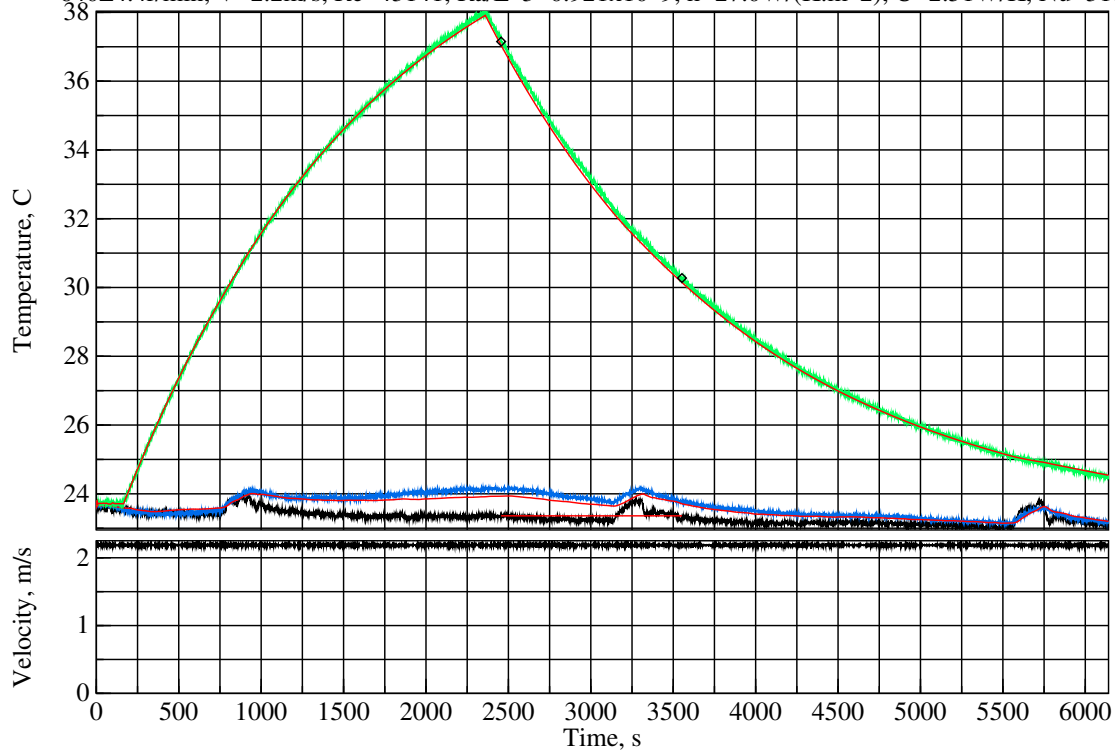
20161009T124341Z – mixed Convection – Roughness=3.00mm; T=19.3+10.4°C; +90.00°  
458±11.1r/min, V=1.6m/s, Re=32465, Ra/L^3=1.028x10^9, h=19.8W/(K.m^2), U=1.84W/K, Nu=235.7



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 32467$ .

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	10.4K	+12.1%/K	0.10K	1.21%	LM35C differential
$P$	101kPa	+0.0010%/Pa	1.5kPa	1.51%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.026%/(J/K)	47J/K	1.22%	plate thermal capacity
$\eta$	0.401	+235%	0.014	3.30%	anemometer calibration
$\varsigma$	6.00mm	+7686%/m	100um	0.77%	post height
$L_m$	3.57mm	+410%/m	500um	0.20%	side metal strip width
$\epsilon_{rs}$	0.040	+25.9%	0.010	0.26%	test-surface emissivity
$\epsilon_{wt}$	0.900	+11.5%	0.025	0.29%	wind-tunnel emissivity
				4.13%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	458r/min	+0.206%/(r/min)	11r/min	2.29%	fan rotation rate
				6.18%	RSS combined uncertainty

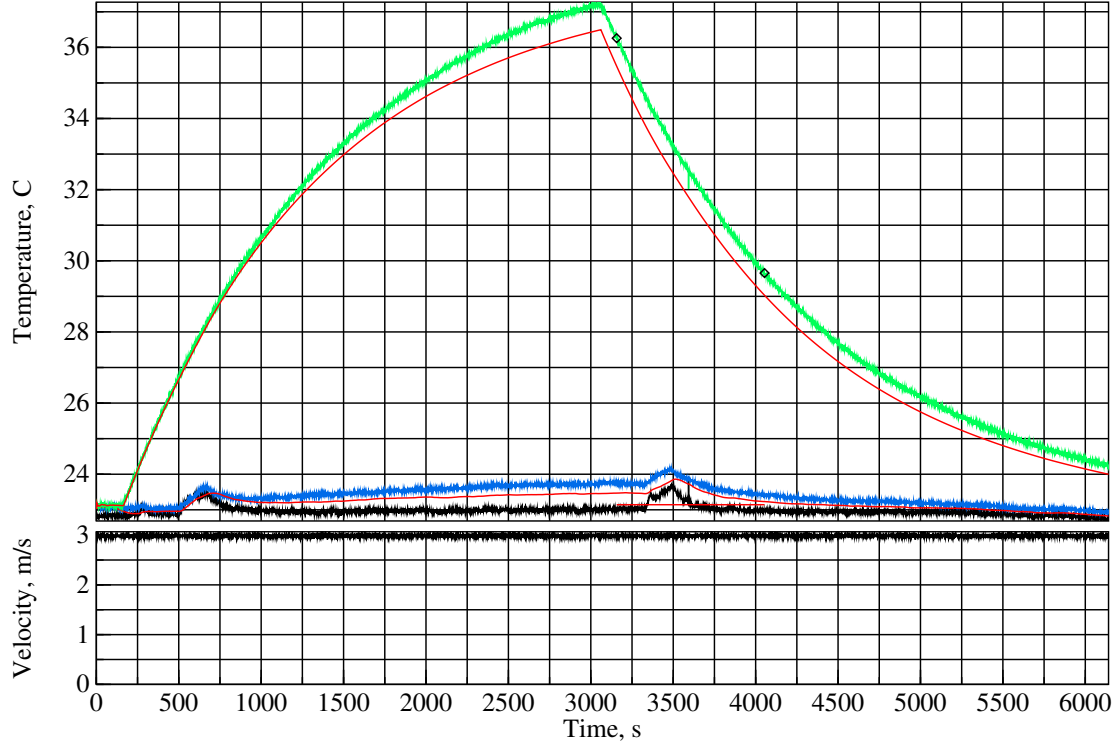
20160807T144333Z – mixed Convection – Roughness=3.00mm; T=23.4+10.0°C; +90.00°  
640±4.4r/min, V=2.2m/s, Re=43141, Ra/L^3=0.921x10^9, h=27.0W/(K.m^2), U=2.51W/K, Nu=318.5



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 43136$ .

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	9.97K	+12.0%/K	0.10K	1.20%	LM35C differential
$P$	100kPa	+0.0010%/Pa	1.5kPa	1.44%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.025%/(J/K)	47J/K	1.17%	plate thermal capacity
$\eta$	0.401	+215%	0.014	3.02%	anemometer calibration
$\varsigma$	6.00mm	+8942%/m	100um	0.89%	post height
$\epsilon_{rs}$	0.040	+20.3%	0.010	0.20%	test-surface emissivity
$\epsilon_{wt}$	0.900	+9.01%	0.025	0.23%	wind-tunnel emissivity
				3.88%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	640r/min	+0.135%/(r/min)	4.4r/min	0.60%	fan rotation rate
				4.06%	RSS combined uncertainty

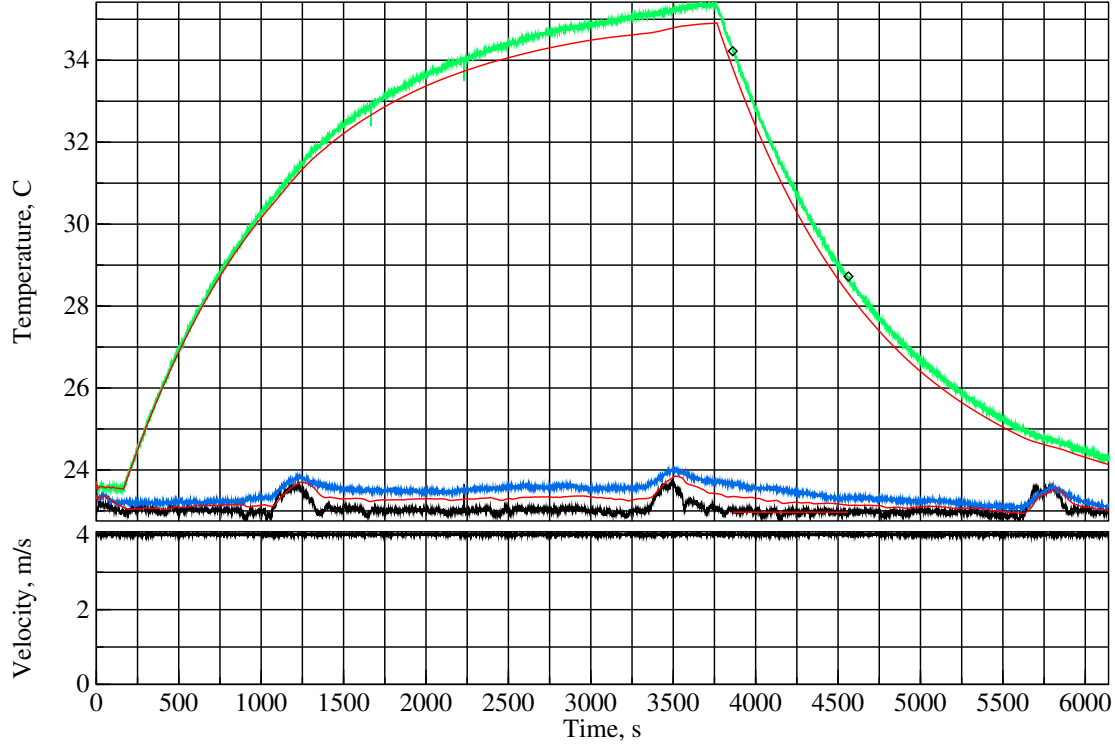
20160830T024010Z – mixed Convection – Roughness=3.00mm; T=23.1+09.5°C; +90.00°  
905±5.2r/min, V=3.0m/s, Re=59590, Ra/L^3=0.898x10^9, h=34.8W/(K.m^2), U=3.24W/K, Nu=410.9



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 59593$ .

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	9.47K	+12.2%/K	0.10K	1.22%	LM35C differential
$P$	101kPa	+0.0009%/Pa	1.5kPa	1.28%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.024%/(J/K)	47J/K	1.13%	plate thermal capacity
$\eta$	0.401	+180%	0.014	2.52%	anemometer calibration
$\varsigma$	6.00mm	+11290%/m	100um	1.13%	post height
				3.49%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	905r/min	+0.081%/(r/min)	5.2r/min	0.43%	fan rotation rate
				3.60%	RSS combined uncertainty

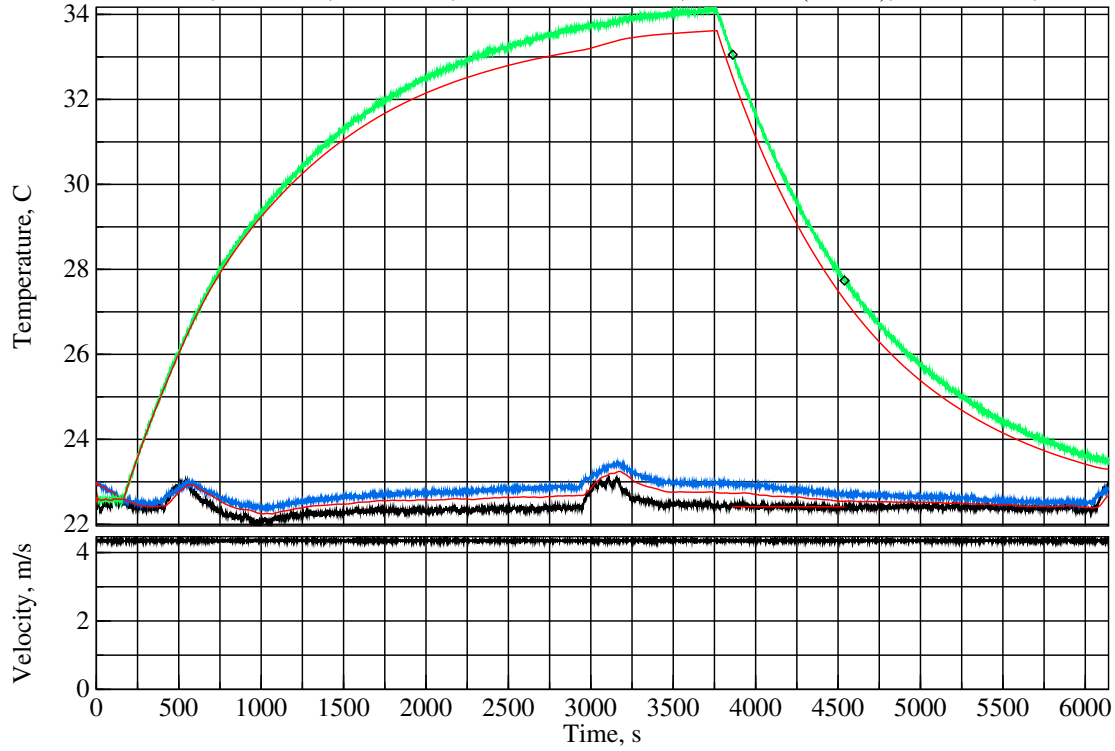
20160807T171527Z – mixed Convection – Roughness=3.00mm; T=23.0+08.2°C; +90.00°  
1280±6.4r/min, V=4.0m/s, Re=79364, Ra/L^3=0.769x10^9, h=43.5W/(K.m^2), U=4.05W/K, Nu=514.3



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 79374$ .

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	8.18K	+13.7%/K	0.10K	1.37%	LM35C differential
$P$	100kPa	+0.0008%/Pa	1.5kPa	1.18%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.024%/(J/K)	47J/K	1.10%	plate thermal capacity
$\eta$	0.401	+142%	0.014	2.00%	anemometer calibration
$u_u$	7.787	+2.65%	0.100	0.26%	diffuser airflow upper bound
$\varsigma$	6.00mm	+12461%/m	100um	1.25%	post height
				3.20%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	1.28kr/min	+0.053%/(r/min)	6.4r/min	0.34%	fan rotation rate
				3.27%	RSS combined uncertainty

20160829T235956Z – mixed Convection – Roughness=3.00mm; T=22.4+07.7°C; +90.00°  
1400±5.8r/min, V=4.3m/s, Re=87125, Ra/L^3=0.744x10^9, h=46.7W/(K.m^2), U=4.34W/K, Nu=552.2



Estimated measurement uncertainties, bi-level 3mm roughness at  $Re = 87122$ .

Symbol	Nominal	Sensitivity	Bias	Uncertainty	Component
$\Delta T$	7.68K	+14.5%/K	0.10K	1.45%	LM35C differential
$P$	101kPa	+0.0008%/Pa	1.5kPa	1.15%	MPXH6115A6U air pressure
$C_{pt}$	4.69kJ/K	+0.023%/(J/K)	47J/K	1.10%	plate thermal capacity
$\eta$	0.401	+131%	0.014	1.84%	anemometer calibration
$u_u$	7.787	+3.06%	0.100	0.31%	diffuser airflow upper bound
$\varsigma$	6.00mm	+12497%/m	100um	1.25%	post height
				3.13%	combined bias uncertainty
Symbol	Nominal	Sensitivity	Variability	Uncertainty	Component
$\omega$	1.40kr/min	+0.051%/(r/min)	5.8r/min	0.30%	fan rotation rate
				3.18%	RSS combined uncertainty