

Component/parameter	Specifications			
	Sunkist		Black box	
CO ₂ sensor	NDIR, SenseAir CO ₂ Engine K30 FR			
SO ₂ sensor	Electrochemical, CiTiceL 3MST/F		Electrochemical, CiTiceL 3MST/F	
Operating temperature	0–50 °C (CO ₂), –2–50 °C (SO ₂)		–20–50 °C	
Operating humidity	0–95 % (CO ₂), 15–90 % (SO ₂), noncondensing		15–90 % (SO ₂), noncondensing	
Operating pressure	Atmospheric ± 10% (SO ₂)		Atmospheric ± 10%	
Temperature dependence	1/T (assumed for CO ₂), 0.25 % °C ^{–1} (SO ₂)		0.25 % ^o C	
Pressure dependence	1.6 %/kPa (CO ₂), 0.0015 %/kPa (SO ₂)*		0.0015 % kPa ^{–1} *	
Response time	2 s (CO ₂), < 20 s (SO ₂)		< 20 s	
Accuracy	±30 ppm ± 5 % signal (CO ₂), ±1 ppm ± 1 % signal (SO ₂)		±1 ppm ± 1 % signal	
Instrument noise (1σ)	5 ppm (CO ₂), 0.05 ppm (SO ₂)		0.05 ppm	
Range	0–5000 ppm (CO ₂), 0–200 ppm (SO ₂)		0–100 ppm	
Sampling rate	2 Hz		2 Hz	
Computer	Arduino, with micro SD card logger		Arduino, with SD card data logger and p motor-shield to power the pum	
Voltage	9 V for SO ₂ sensor (alkaline battery), 3.7 V LiPo battery for Arduino		9 V for SO ₂ sensor (alkaline battery), 11.1 V LiPo battery for Arduino and pump	
Inlet	Particle filter		3 denuders (50 cm) or 3 × 2 denuders (15 cm)	
Others	Warm up time	1 min (CO ₂)	Micro solenoid valves	First Sensor, Germany TN2P006LM05LB
	Additional sensors	Temperature, pressure, relative humidity		First Sensor, Germany, WBAL001DUH0
			Micro pump	TCS micropumps, UK, DS250BL
Weight	500 g		500 g	
dimensions	14 × 13 × 14 cm (L × W × H)		20 × 13 × 14 cm (L × W × H)	