

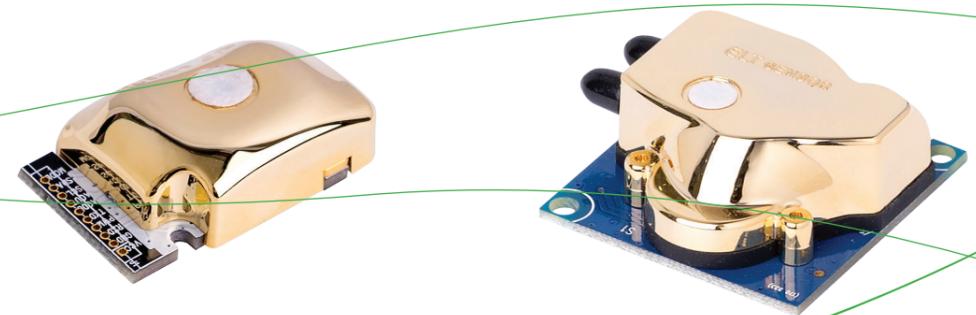
ELT SENSOR

Smart Farm and
Safe and Pleasant Life with ELT SENSOR



NDIR GAS SENSOR SPECIALIST

WITH NEW TECH &
RELIABLE PARTNER



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Greetings



ELT SENSOR is a gas sensor specialized company with world-class sensor technology and exclusive patented technology.

Create Smart World with ELT Sensor

With motto of 'ELT Sensor create safer and comfortable Ubiquitous World', ELT has been a gas-sensor developer with world-best sensor technologies.

ELT patented many core technologies fabricated into various NDIR (Non-Dispersive Infrared) gas sensors to detect gases such as CO₂, CO, CH₄, propane, butane, ethylene, etc with high accuracy and long term stability.

ELT keep the effort to provide the best sensor with most optimized solution so that our present and future customers could be leaders and create the better world in IoT, HVAC, Agricultural and many scientific fields.

Thank you.

ELT SENSOR CEO

Sensor Comparison and Selection Guide Table

1. Sensor Modules for Combustible, Inflammable Gas Detection

○ : Yes, ● : Order option, X : No
 Application list : A : Software ACDL(Residential Indoor Ventilation, HVAC), G: Agricultural Green House, L : Low power, LG: Lowpower+ Greenhouse

Types	Model	Sensing Gas	Supply Voltage	Size(mm)	Accuracy	Outputs						Subsidiaries with suffix	Application	Marked as	Pages
						Range (ppm)	UART Serial	I2C	PWM	Linear Voltage	Digital Alarm				
Module	T-110 T-110-3V	CO2	5VDC(4.75~5.25) 3VDC(3.20~3.55)	19x29.3x8.5	50ppm ± 3%	400~2K,3K,5K,10K, 20K, 30K, 50K,100K	○	○	●	●	○	A, G, L, LG	Residential, Incubator	Battery, Smallest, popular	6
Module	T-200 T-200-3V	CO2	5VDC(4.75~5.25) 3VDC(3.20~3.55)	19.4x30x10.3	50ppm ± 3%	400~2K,3K,5K,10K,20K,30K,50K,100K	○	○	●	●	x	A, G, L, LG	Residential, Incubator	Battery, Smallest, popular	6
Module	S-300 S-300-3V	CO2	5VDC(4.75~5.25) 3VDC(3.20~3.60)	33x33x13.1	30ppm ± 3%	0~2K,3K,5K,10K, 20K, 30K, 50K	○	○	○	○	○	A, G, L, LG, W	Residential, Agricultural, Weather	Battery, Low-Power popular	7
Module	S-110	CO2	5VDC(4.75~5.25)	33x33x13.1	30ppm ± 3%	0~2K,3K,5K,10K	○	○	x	●	x	A, G	Residential, Agricultural	Small, Stable, Popular	7
Module	IoT-S300E	CO2	5VDC(4.75~5.25), 3VDC(3.20~3.60)	33x33x13.1	50ppm ± 5%	400~2K, 5K	○	○	x	x	x	A	Residential	Small, Economical, Popular	8
Module	S-110H	CO2	12VDC(9.0~18.0)	39x32x18.5	50ppm ±3%	0~2K,3K,5K,10K	○	○	●	●	x	A, G	Residential, Agricultural	Small, Stable, Popular	9
Module	B-530	CO2	12VDC(9.0~15.0)	65x50x20	30ppm ± 3%	0~2K,3K,5K,10K	○	x	x	○	x	G	Residential, Agricultural	High stability	9
Module	D-300 D-300-3V	CO2	5VDC(4.75~5.25) 3VDC(3.20~3.60)	33x33x13.1	30ppm ± 3%	0~2K,3K,5K,10K, 20K, 30K, 50K	○	○	●	●	○	G, L, LG	Residential, Agricultural	World Smallest Dual Beam, popular	10
Module	D-400	CO2	5VDC(4.75~5.25) 3VDC(3.20~3.60) 12VDC	69x50x23	30ppm ± 3%	0~2K,3K,5K,10K, 20K, 30K, 50K	○	○	●	●	x	G, L, LG	Residential, Agricultural	Dual Beam, High-end	10
Module	H-250 H-250-3V H-250-12V	CO2	5VDC(4.75~5.25) 3VDC(3.20~3.60) 12VDC	32.5x38x19.1 50x69x20	0.03%(300ppm) ± 3%	0~5%,10%,15%,20%,25%	○	○	●	●	x	L, G	CA storage, Agricultural, incubator	High stability	11
Module	CxHx-D3 CxHx-D3-3V	CH4, C2H4, C3H8, C4H10	5VDC(4.75~5.25) 3VDC(3.20~3.60)	33x33x13.1	±3% of F.S.	0~50K, 27K, 21K, 18K 0~100 % LEL % (1 % unit)	○	○	●	●	○	L	Industrial Gas Leakage	Ethylene, Propane, Butane (available)	12
Module	CxHx-LD/LF CxHx-LD/LF-3V	CH4, C2H4, C3H8, C4H10	5VDC(4.75~5.25), 3VDC(3.20~3.60)	40x38x17.5	±3% of F.S.	0~10% LEL 0~100%LEL	○	○	x	●	x	G	Industrial Gas Leakage	The lowest Detection Limit (50ppm)	12

2. Transmitters or Controllers for Combustible, Inflammable Gas Detection

Types	Model	Sensing Gas	Supply Voltage	Size(mm)	Accuracy	Outputs							Application	Marked as	Pages
						Range(ppm)	Current 4~20mA 2~20mA	Voltage 0~10V 2~10V	Relay	Wiring	LCD	RS485 Modbus			
Transmitter	CH-CD300	CH4, C2H4, C3H8, C4H10	24VDC(20%)	123x69x40	±3% F. S.	0~50K, 27K, 21K, 18K	○	○	x	3-Wired, 4-Wired	●	x	Industrial Gas Leakage		13
Transmitter	CD-100	CO2	24VDC/AC(12~36VDC/AC)	123x69x40	30ppm ±5%	0~2K, 3K, 5K, 10K	○	○	x	3-Wired, 4-Wired	●	x	A,G, Residential, Agricultural	High stability,	14
Transmitter	CD-100M-HT	CO2, Temp, RH.	24VDC/AC(12~36VDC/AC)	123x69x40	30ppm ±5%	0~2K, 3K, 5K,10K	○	○	x	3-Wired, 4-Wired	●	○	A,G, Residential, Agricultural	High stability,	14
Transmitter	CD-200	CO2	24VDC, AC(20%)	123x69x40	30ppm ±5%	0~2K, 3K, 5K, 10K	○	○	○	4-Wired	●	x	Residential	with Relay	15
Transmitter	CD-300(G)	CO2	24VDC(20%)	123x69x40	30ppm ±5%	0~2K, 3K, 5K,10K, 20K, 30K, 50K, 70K	○	○	x	3-Wired	●	x	Residential, Agricultural, Incubator	High Concentration	15
Transmitter	CD-400	CO2	24VDC, AC(20%)	123x69x40	50ppm ± 3%	0~2K, 3K, 5K,10K	○	○	○	4-Wired, 3-Wired	●	x	Residential, Agricultural, Work place	with Relay	15
Transmitter	AQM-100	CO2, Temp., RH., VOCs	12VDC	118x74x22	30ppm ±5%	0~10K	x	x	x	x	x	○	Residential, Workplaces	RS485-Modbus	16
Transmitter	AQM-200	CO2, Temp., RH., VOCs	12VDC,AC(20%)	136.5x85x24	30ppm ±5%	0~2K, 3K, 5K, 10K	○	○	○	4-Wired	●	○	Residential, Workplaces	Lockable, Mounting holes are configurable for US or European junction boxes.	16
Transmitter	COD-200 / COD-200-HC	CO	24VDC, AC(20%)	123x69x40	±5%, ±10% F. S. / ±10%, ±15% F. S.	0~100, 250, 300 / 0~500, 1K 0~100% LEL(1% Resolution)	○	○	x	3-Wired, 4-Wired	●	○	Parking-Lot	RS485-Modbus	17
Transmitter	DUT-1000(M)/ DUT-2000(M)	CO2	24VDC, AC(20%)	85x115x49	50ppm±3% 30ppm±3%	0~2K, 3K, 5K,10K, 20K, 30K, 50K	○	○	○	3-Wired, 4-Wired	●	○	Residential / Residential, Agricultural	Single/Dual-Beam, Duct Type	18
Transmitter	P-1000	CO2	5V, 12VDC	35Φ (Screw : 45Φ) x 62mm	0.03%±3%	0~5%,10%,15%,20%,25%	○	x	x	x	x	x	CA, Incubator	UART, I2C	18
Transmitter	P-2000	CO2	24VDC, AC(20%)	85x115x45	0.1%±3%	0~5%, 10%, 15%, 20%, 25%	○	○	○	3-Wired, 4-Wired	x	○	CA, Incubator	RS485-Modbus, Relay, Duct Type	18

3. Monitors for Combustible, Inflammable Gas Detection

Types	Model	Sensing Gas	Supply Voltage	Size(mm)	Accuracy	Outputs					Application	Marked as	Pages	
						Range (ppm)	LCD	LED	Mini USB	RS485 Modubus				Sound Alarm
Monitors	CD-2000M	CO2,O2,C2H4,Temp, Humidity	24VAC/DC	180x290x135	CO2 : ±3%, O2 : 0.1% C2H4 : 0.2ppm, Temp : ±1% Humidity : ±2% RH	CO2, O2 : 0~25%, C2H4 : 0 - 10ppm Temp : -30°C-to-70°C Humidity : 0 to 100%	x	x	x	○	x	CA storage, Agricultural	Multi-gas monitor	19
Monitors	MT-200	CO2	5VDC USB type	19.4x55.6x10.3	70ppm ±3%	400~10K, 50K, 100K	x	○	○	x	x	Smart phone, PC, USB-Bank, Car	World Smallest USB Monitor	20
Monitors	MB-350U	CO2, Temp, Humidity	12VDC	135x90x27.5	30ppm±3%	0~10K	○	○	○	●	○	Residential	Accurate, Popular	21
Monitors	MB-350U-V	CO2, Temp, Humidity, VOCs	12VDC	135x90x27.5	30ppm±3%	0~10K	○	○	○	●	○	Residential, Agricultural	Accurate, Popular	21
Monitors	MB-350U-C	CO2, Temp, Humidity, CO	12VDC	135x90x27.5	30ppm±3%	0~10K (CO2) 0~300 (CO)	○	○	○	●	○	Residential, Workplaces	High Accurate, Popular, Popular	21
Monitors	MB-350U-C-V	CO2, Temp, Humidity, CO, VOC	12VDC	135x90x27.5	30ppm±3%	0~10K (CO2) 0~300 (CO)	○	○	○	●	○	Residential, Workplaces	High Accurate, Popular, Popular	21

CO₂ Sensor Module- world smallest

T-110, T-110-3V, T-200, T-200-3V

T-110 and T-200 series are the world's smallest CO₂ sensor modules. Its convenient BTB connection and easier management with ACDL function are much favored by customers in Residential HVAC Application etc.

T-110-3V and T-200-3V series are much favored by customers whose application needs 3.3Voltage input and sleep mode support so on.



	T-110	T-110-3V	T-200	T-200-3V
Sensing Method	NDIR (Non-dispersive Infrared) / Single type			
Dimensions	19mmx29.3mmx8.5mm (5g)		19.4mm x 30mm x 10.3mm (5g)	
CO₂ Measurement range	400 to 2,000/3,000/5,000/10,000ppm (2%/3%/5%/10% models are available) – Optional			
Accuracy	± 50ppm ± 3% of reading (±300ppm ±3% of reading – 2%/3%/5%/10% models)			
Operating Temperature range	0 to 50°C		-20°C ~ 60°C	
Storage Temperature	-30°C to 70°C			
Operating Humidity range	0 to 95% RH (Non-condensing)			
Input Power	5.0VDC±5%	3.3VDC (3.2V to 3.55V)	5.0VDC±5%	3.3VDC (3.2V to 3.55V)
Power consumption	Normal : 20mA, Max : 200mA Sleep : 0.5mA	Normal : 12mA Max : 180mA Sleep : 0.2mA	Normal : 22mA Max : 250mA	Normal : 12mA Max : 200mA
Response Time (90%)	90 sec		40 Sec (1/e) (T90 : 65 Sec)	
Sampling Interval	5 sec		3 sec	
Output	UART- 38,400BPS, 8bit, No parity, 1 stop bit TTL Level I2C => Slave PWM(Optional) Analog Voltage (Option) => VDC 0.5 to 4.5V (5V model) or VDC 0.5 to 3.0V (3.3V model)			

Ordering Code	Option List
T-110L, T-110L-3V T-200L, T-200L-3V (Low Power)	Sleep mode is added on T-110/T-200 for Low power, which consume < 0.5mA or <0.2mA
T-110G, T-110G-3V T-200G, T-200G-3V (99% Humidity)	Resistance up to 99% Humidity is added on T-110/T-200, for Application of bathroom
T-110A, T-110A-3V T-200A, T-200A-3V (ACDLS/W)	Operate with ACDL S/W as default only for application of Residential Indoor Air Quality Monitoring which calibrate sensor every week by itself

CO₂ Sensor Module

S-300, S-300-3V, S-110

The S-300 series are one of the smallest sensors which they can be integrated into small size needed wall-pads and monitoring devices, Building ventilation controllers, Air-conditioners, Vehicle drowsiness Gas equipments and so on.

S-300L-3V is much favored by Low-Power consumption needed customers because of its 3.3Voltage operation and sleep mode support.

Unlike S-300 series, S-110 has a white-filter which detects CO₂ gas on the bottom.

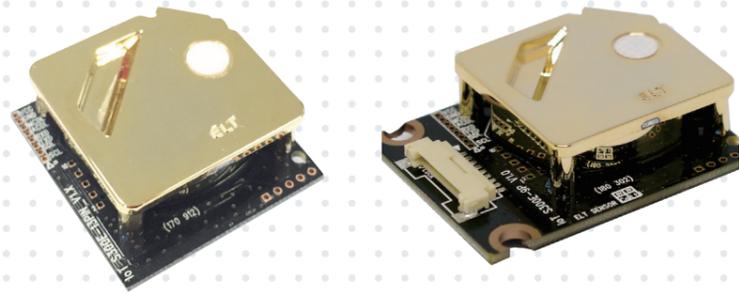


	S-300	S-300-3V	S-110
Sensing Method	NDIR (Non-dispersive Infrared)		
Dimensions	33mm×33mm×13.1mm (10g)		
CO₂ Measurement range	0 to 2,000/3,000/5,000/10,000ppm (2%/3%/5% available) – Optional		0 to 2,000/3,000/5,000/10,000ppm – Optional
Accuracy	± 30ppm ± 3% of reading (±20ppm ±3% of reading, after 2days Automatic Calibration)		± 50ppm ± 3% of reading (±30ppm ±3% of reading, after 2days Automatic Calibration)
Operating Temperature range	-20°C to 50°C (Option : -10 ~ 60°C)		-10°C to 60°C
Storage Temperature	-30°C to 70°C		
Operating Humidity range	0 to 95% RH (Non-condensing)		
Input Power	5.0VDC ±5% Regulation	3.3VDC (3.2V to 3.6V)	5.0VDC ±5% Regulation
Power consumption	Normal: 19mA Max: 240mA / Sleep: 0.5mA	Normal: 12mA Typ: 180mA / Sleep: 0.3mA	Normal: 14mA Max: 230mA
Response Time (90%)	120 sec		
Sampling Interval	3 sec		
Output	UART: 38,400BPS I2C : Slave PWM(Optional) Analog Voltage (Option) : VDC 0.5 to 4.5V (linear output) Modbus Support (Option)		UART: 38,400BPS I2C : Slave Analog Voltage (Option) : VDC 0.5 to 4.5V (linear output)

Ordering Code	Option List
S-300, S-300-3V	UART, I2C, ALARM, AVO(PWM option), 10'MCDL, ACDL, 13+14Connectors
S-300L, S-300-3V (Low Power)	Sleep mode is added on S-300 and S-300-3V for Lowpower, which consume <0.5mA(5V) or <0.3mA(3V)
S-300G, S-300G-3V (99% Humidity)	Resistance up to 99% Humidity is added on S-300 and S-300-3V for Agricultural Green House
S-300LG, S-300LG-3V	Sleep mode and 99% Humidity for Low power consumption needed Applications.
S-110	H/W based MCDL & H/W based ACDL are supportive.
S-300A, S-300A-3V, S-110A (ACDL S/W)	Operate with ACDL S/W as default only for application of Residential Indoor Air Quality Monitoring which calibrate sensor every week by itself.

IoT-S300E, IoT-S300E-3V

The IoT-S300E Series are developed to cover IOT-devices which cover big number of nodes or volume production for living appliances to monitor residential houses and buildings.
IoT-S300E-3V Series could be chosen for lower power consumption.



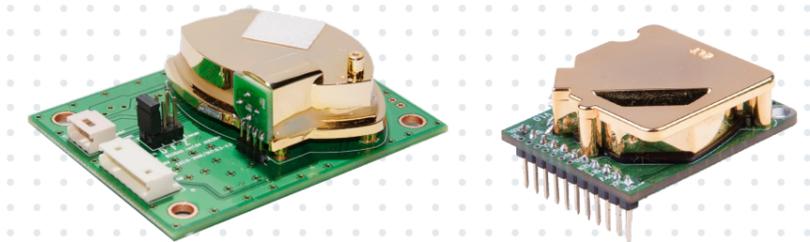
	IoT-S300E(-9P)	IoT-S300E-3V(-9P)
Sensing Method	NDIR (Non-dispersive Infrared) / Single type	
Dimensions	33mm x 33mm x 13.1mm (10g)	33mm x 44mm x 13mm (15g)
CO₂ Measurement range	400 to 2,000/5,000ppm	
Accuracy	±50ppm ±5% of Reading with ACDL Logic condition	
Operating Temperature range	-10°C to 50°C	
Storage Temperature	-30°C to 70°C	
Operating Humidity range	0 to 95% RH (Non-condensing)	
Input Power	5.0V(4.75~5.25V)	3.3V(3.10~3.50V)
Power consumption	Normal : 5.6mA Max : 300mA	Normal : 5mA Max : 200mA
Response Time (90%)	90 sec	
Sampling Interval	5 sec	
Output	UART- 38,400BPS, 8bit, No parity, 1 stop bit TTL Level I2C - Slave mode only	

Ordering Code	Option List
IoT-S300E(-3V)	With 8pin Side-hole
IoT-S300E(-3V)-9P	With 9pin Connector
IoT-S300EA(-3V)(-9P) (S/W ACDL)	Operate with ACDL S/W as default only for application of Residential Indoor Air Quality Monitoring which calibrate sensor every week by itself.

B-530, S-110H

B-530 is designed to measure CO₂ level in the air. Its Persistent Stability and Temperature Effect Resistance besides easy management are much favored by customers in stocks raising, scientific projects, etc. B-530 simultaneously transmits calibrated digital and analog output signal.

S-110H which operates 12VDC have stability with wider voltage tolerance(9 to 18VDC) which is much favored by harsh applications of Livestock raising, plant growing, scientific projects etc.



	B-530	S-110H
Sensing Method	NDIR (Non-dispersive Infrared) / Single type	
Dimensions	65mm x 50mm x 22.2 mm (25g)	39mm x 32mm x 18.5mm (10g)
CO₂ Measurement range	0 ~2,000/3,000/5,000/10,000ppm (5% models are available)	0 ~ 2,000/3,000/5,000/10,000ppm
Accuracy	± 30ppm ± 3%	± 50ppm ± 3% of Reading
Operating Temperature range	-20°C ~ 65°C	-10°C ~ 60°C
Storage Temperature	-30°C to 70°C	-30°C ~ 70°C
Operating Humidity range	0 to 95% RH (Non-condensing)	
Input Power	12VDC (9 to 15VDC, ±2% Regulation)	12VDC (9 to 18VDC, ±10% Regulation)
Power consumption	Normal : 33mA Max : 230mA	Normal : 14mA Max : 145mA
Response Time (90%)	120 sec	90 sec
Sampling Interval	3 sec	
Output	UART- 38,400BPS, 8bit, No parity, 1 stop bit TTL Level Analog Voltage => VDC 0.5 to 4.5V (linear output)	UART- 38,400BPS, 8bit, No parity, 1 stop bit TTL Level I2C => Slave PWM (Option) Analog Voltage (Option) => VDC 0.5 to 4.5V (linear output)

Ordering Code	Option List
B-530G, S-110HG (99%Humidity)	Resistance up to 99% Humidity is added on B-530, S-110H for Application of Green House
S-110HA (ACDL S/W)	Operate with ACDL S/W as default only for application of Residential Indoor Air Quality Monitoring which calibrate sensor every week by itself

CO₂ Sensor Module- Dual Type

D-300, D-300-3V, D-400

D-300 series are the world smallest Dual CO₂ sensor module. Their persistent stability and accuracy are much favored in warehouses, greenhouses, hospitals, etc., besides the small size and consistent accuracy through the life cycle.

D-300L-3V is much favored by customers whose application operate with 3.3V input and sleep mode support.

D-400 series are robust sensors so that they endure harsh environment besides good long-term persistancy, of which 3.3V, 5V, 12V operation models are available.



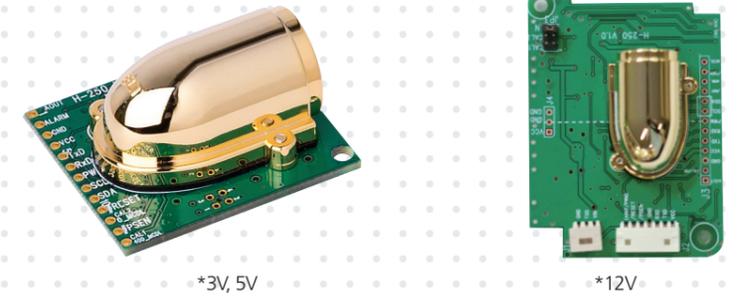
	D-300	D-300-3V	D-400
Sensing Method	NDIR (Non-dispersive Infrared) / Dual beam type		
Dimensions	33mm×33mm×13.1mm		50mm x 69mm x 26mm
CO₂ Measurement range	0 to 2,000/3,000/5,000/10,000ppm (2%/3%/5% models are available) – Optional		
Accuracy	±30ppm ± 3% of reading		
Operating Temperature range	-20℃ ~ 50℃		
Storage Temperature	-30℃ to 70℃		
Operating Humidity range	0 to 95% RH (Non-condensing) / For GreenHouse: 0 to 99% RH(Non-condensing)		
Input Power	5.0VDC ±5%	3.3VDC (3.2V to 3.6V)	5.0VDC, 3.3VDC(option), 12VDC (option)
Power consumption	Normal : 25mA Max: 250mA Sleep: 0.5mA	Normal: 12mA Max: 180mA Sleep: 0.3mA	Normal : 20mA Max : 262mA(3V) / 270mA(5V) / 273mA(12V)
Response Time (90%)	90 sec		
Sampling Interval	3 sec		
Output	UART: 38,400BPS (9,600/19,200 bps is settable with command), I2C : Slave PWM (Option) Analog Voltage (Option) : VDC 0.5 to 4.5V (linear output) / Modbus Support (Option)		

Ordering Code	Option List
D-300, D-300-3V	UART, I2C, ALARM, AVO(PWM option), '0/400' MCDL
D-300L, D-300L-3V (Low Power)	Sleep mode is added on D-300 and D-300-3V for Low power which consume (0.5mA(5V) or 0.3mA(3V))
D-300G, D-300G-3V(99%Humidity)	Resistance up to 99% Humidity is added on D-300 and D-300-3V for Agricultural Green House.
D-300LG, D-300LG-3V	Sleep mode and 99% Humidity for Low power consumption needed Applications.
D-400, D-400-3V	UART, I2C, 1st +2nd ALARM, AVO(PWM option), '0/400' MCDL
D-400L, D-400L-3V	Sleep mode is added on D-400 for Low power, which consume (0.5mA(5V) or 0.3mA(3V))
D-400G, D-400G-3V(99%Humidity)	Resistance up to 99% Humidity is added on D-400 for Agricultural Green House.
D-400LG, D-400LG-3V	Sleep mode and 99% Humidity for Low power consumption needed Applications.
D-400(LG)-12V	12V Input voltage support.

CO₂ Sensor Module-High Concentration

H-250, H-250-3V, H-250-12V

H-250 series is designed to measure high concentration CO₂ level in the air. Their persistent stability and accuracy are much favored in CA storage, greenhouses, incubators and so on.



	H-250	H-250-3V	H-250-12V
Sensing Method	NDIR (Non-dispersive Infrared) / Single type		
Dimensions	32.5mm×38mm×19.1mm (10g)		50mm x 69mm x 20mm (20g)
CO₂ Measurement range	0 to 25% (5%/10%/15%/20% models are available)		
Accuracy	±0.03%(300ppm) ± 3% of reading		
Operating Temperature range	-10℃ to 60℃		
Storage Temperature	-30℃ to 70℃		
Operating Humidity range	0 ~ 95% RH (Non-condensing)		
Input Power	5V ± 5% (Side hole) (12V is optional)	3.2V ~ 3.6V	12V ± 5% (3pin Connector, J1)
Power consumption	Normal : 29mA Max : 379mA	Normal : 10mA Max : 228mA	Normal mode : 27mA MAX : 374mA
Response Time	60 sec (1/e)		120 sec (90%)
Sampling Interval	3 sec		
Output	3pin/7pin Connector	UART – 38,400BPS, 8bit, No parity, 1 stop bit TTL Level Analog Voltage (Option) => VDC 0.5 to 4.5V (linear output) PWM (Option)	
	Side hole	UART– 38,400BPS, 8bit, No parity, 1 stop bit TTL Level I2C (Slave) PWM (Option) Analog Voltage (Option) => VDC 0.5 to 4.5V (linear output)	

Ordering Code	Option List
H-250(3V, 5V, 12V)	0~5%, 10%, 15%, 20%, 25% CO ₂ level are selectable
H-250G(3V, 5V, 12V)	Resistance up to 99% Humidity for Application of Green House etc.

CH4/C2H4/C3H8/C4H10 Sensor Module- Dual Type

CxHx-D3, CxHx-D3-3V, CxHx-LD/LF, CxHx-LD/LF-3V

CxHx series are NDIR CH4(Methane) & C2H4(Ethylene) & C3H8(Propane) & C4H10(Butane) gas sensor modules with dual beam. Its consistent Stability through the life cycle and Temperature change Effect Compensation are incomparably favored by industrial field experts carrying various flammable, explosive, and hazard gases.

CxHx-D3 Series are one of the smallest sensors and the measurement range is 0~100% LEL. CxHx-LD/LF series are the world's first combustible sensor modules which can detect low concentration of gases up to 5,000ppm. CxHx-LD is Diffusion type and CxHx-LF has 'F' option which has two tube inlets for 'Flow Through' instead of white colored filter for 'Diffusion'.



CxHx : CH4, C2H4, C3H8, C4H10

	CxHx-D3	CxHx-D3-3V	CxHx-LD/LF	CxHx-LD/LF-3V
Sensing Method	NDIR (Non-dispersive Infrared) / Dual Type			
Dimensions	33mm×33mm×13.1mm (10g)		40mm x 38mm x 18.5mm (20g)	
Measurement range	0~100% LEL (0~50,000ppm/27,000/21,000/18,000ppm for Methane/Ethylene/Propane/Butane)		0~5,000ppm (0~10% LEL) *0~50,000ppm (0~100%LEL) is optional	
Accuracy	±3% F.S			
Operating Temperature range	-20°C to 50°C			
Storage Temperature	-30°C to 70°C			
Operating Humidity range	0 to 95% RH (Non-condensing)			
Input Power	5V ± 5%	3.2V to 3.6V	5V ± 5%	3.2V to 3.6V
Power consumption	Normal:25mA / Max. 250mA / Sleep. 0.5mA	Normal:12mA / Max. 180mA / Sleep. 0.3mA	Normal : 22mA / Max.360mA	Normal : 14mA / Max.270mA
Response Time (90%)	100 sec / 70 sec		LD : 30 sec (90%) / 20 sec (1/e)	LF : 15 sec (90%) / 10 sec(1/e)
Sampling Interval	3 sec			
Output	UART- 38,400BPS, 8bit, No parity, 1 stop bit TTL Level I2C => Slave PWM (Option) Analog Voltage (Option) => VDC 0.5 to 4.5V (5V model) or VDC 0.5 to 3.0V (3.3V model)		UART- 38,400BPS, 8bit, No parity, 1 stop bit TTL Level I2C => Slave Analog Voltage (Option) => VDC 0.5 to 4.5V (5V model) or VDC 0.5 to 3.0V (3.3V model)	

Ordering Code	Option List
CxHx-D3(-3V)	UART, I2C, ALARM, (AVO or PWM is optional), ACDL, '0'ppm MCDL
CxHx-D3L(-3V)	Sleep mode is added on CH-D3 for Low power, which consume < 0.3mA
CxHx-LD(-3V)	Diffusion Type
CxHx-LF(-3V)	Flow Through Type
CxHx-LD/LFG(-3V)	Resistant up to 99% Humidity for Application of Agricultural Green House

CH4/C2H4/C3H8/C4H10 Transmitter

CxHx-CD300

CxHx-CD300 is CH series Transmitter which detect CH4(Methane) or C2H4(Ethylene) or C3H8(Propane) or C4H10(Butane) gas in the air. It sends current or voltage signals and gives 3 wired input power (2 PWR lines, 1 Common GND line).

Sensing Method	NDIR (Non-dispersive Infrared) / Dual Type
Dimensions	123mm x 69mm x 40mm (115g)
Measurement range	0~100% LEL (0~50,000ppm/27,000/21,000/18,000ppm for Methane/Ethylene/Propane/Butane) * 0~10% LEL is available
Accuracy	± 3% of F. S.
Operating Temperature range	-10°C to 50°C
Storage Temperature	-30°C to 70°C
Operating Humidity range	0 to 95% RH (Non-condensing)
Input Power	24VDC ± 20%, 50/60Hz - 3 Wire
Response Time (90%)	120 sec
Sampling Interval	3 sec
Output	① 4 ~ 20mA & 2 ~ 10VDC ② 0 ~ 10VDC & 0 ~ 20mA (Jumper selectable -Voltage output or currant output)
Other options	'L' : with LCD display

Ordering Code	Option List
CxHx-CD300	EL100% (0 to 5%), without LCD
CxHx-CD300L	LEL100%(0 to 5%), with LCD
CxHx-LD-CD300	LEL10% (0 to 5,000ppm), without LCD
CxHx-LD-CD300L	LEL10% (0 to 5,000ppm), with LCD



CO₂ Sensor Transmitter

CD-100, CD-100M, CD-100M-HT

CD-100 series are CO₂ Sensor separated One-Board Transmitter, which give 0-20mA / 4-20mA Current or 0-10V / 2-10V Voltage with Jumper selection. 'HT' model has the temperature and humidity sensors.



* TR-100B series are on sale (Board only)

Sensing Method	NDIR (Non-dispersive Infrared)
Dimensions	123mm x 69mm x 40mm (115g) (1 board : Sensor with mainboard)
CO₂ Measurement range	0 to 2,000/3,000/5,000/10,000ppm, - Jumper position change
Accuracy	±30ppm ±5%
Operating Temperature range	-10°C to 60°C (-40°C ~ 40°C optional)
Storage Temperature	-30°C to 70°C (-40°C ~ 70°C optional)
Operating Humidity range	0 to 95% RH (Non-condensing), 'G': 0 to 99% RH (Non-condensing, green house)"
Input Power	"24VAC (12V ~ 36V), 50/60Hz - 4 Wire 24VDC (12V ~ 36V), 50/60Hz - 3 Wire"
Response Time (90%)	120 sec
Sampling Interval	3 sec
Output	① 4 ~ 20mA & 2 ~ 10VDC ② 0 ~ 10VDC & 0 ~ 20mA (Jumper selectable -Voltage output or current output) ③ Modbus : CD-100M, CD-100M-HT model"
Temperature & Humidity (Option)	① Temperature Sensor Specification 0°C to 65°C ±0.4 °C (Optional : -20°C to 0°C ±0.7 °C) ② Humidity Sensor Specification Accuracy 10% to 90% ±4% RH (Optional : under 10%, over 90% ±7% to ±8% RH)
Other options	'L' : with LCD display 'G' : Resistance up to 99% Humidity (Non-Condensing) 'BZ' : CO ₂ Operating Temperature range -40°C ~ 40°C

Ordering Code	Option List
CD-100(LG)-3W	3 Wired, CO ₂ ('L' : LCD display , 'G' : 99% Humidity - optional)
CD-100(LG)-4W	4 Wired, CO ₂ ('L' : LCD display , 'G' : 99% Humidity-optional)
CD-100M(LG)	4 Wired, RS485-Modbus, CO ₂ ('L' : LCD display , 'G' : 99% Humidity-optional)
CD-100M(LG)-HT	4 Wired, RS485-Modbus, Temperature, Humidity, CO ₂ ('L' : LCD display , 'G' : 99% Humidity-optional)

CO₂ Sensor Transmitter

CD-200, CD-300, CD-400

CD-200/300/400 series are CO₂ sensor separated Two-Board Transmitters, which give 0-20mA/4-20mA Current or 0-10V/2-10V Voltage with Jumper selection. CD-200 is 4+2 wired (2 Power lines, 2 Signal lines and 2 Relay lines) while as CD-300 is 3 wired (2 Power lines, 1 Common GND line). As for CD-400, it supports Temperature Relay output as well as CO₂ Relay output.



	CD-200	CD-300	CD-400
Sensing Method	NDIR (Non-dispersive Infrared)		
Dimensions	123mm x 69mm x 40 mm (115g)		
CO₂ Measurement range	0 to 2,000/3,000/5,000/10,000ppm -settable by switch	0 to 2,000/3,000/5,000/10,000ppm (2%/3%/5%/7% are available)	0 to 2,000/3,000/5,000/10,000ppm -settable by switch
Accuracy	±30ppm ± 5%		±50ppm ± 3%
Operating Temperature range	-10°C ~ 60°C		
Storage Temperature	-30°C to 70°C		
Operating Humidity range	0 to 95% RH (Non-condensing)		
Input Power	24VAC, 24VDC ± 20%, 50/60Hz (4 wire) 24VDC (12~36VDC) (3 wire)	24VDC±20%	24VAC± 20%, 50/60Hz(4 wired) 24VDC ± 20% (3 wired)
Response Time (90%)	150 sec		
Sampling Interval	3 sec		
Output	① 4~20mA & 2~10VDC ② 0~10VDC & 0~20mA(Jumper selectable-Voltage output or current output)		
Other options	'L' : with LCD display 'G' : Resistance up to 99% Humidity (Non-Condensing)		
Relay	CO ₂ Relay	Without Relay	CO ₂ Relay (Temperature Relay is optional)

Ordering Code	Option List
CD-200, CD-300	without LCD
CD-200L, CD-300L	with LCD
CD-300G (99% Humidity)	Resistance up to 99% Humidity is added on CD-300 for Agricultural Green House, etc.
CD-300G-D3 (99% Humidity)	Resistance up to 99% Humidity is added on D-300(without LCD), for Application of Green House
CD-400	CO ₂ Relay, 6 Wired
CD-400-T	CO ₂ Relay, Temperature Relay, 9 Wired
CD-400LG	6 Wired, CO ₂ -Relay ('L' : LCD display , 'G' : 99% Humidity-optional)
CD-400LG-T	9 Wired, CO ₂ -Relay, Temperature-Relay ('L' : LCD display , 'G' : 99% Humidity-optional)

AQM-100, AQM-200

AQM-100 measures the indoor air quality (IAQ). Installed in the living room or in the bed room, It measures the level of CO₂, Temperature, Humidity, VOCs to maintain pleasant air quality. This compact size transmitter has sensitive 4 sensors (CO₂, Temperature, Humidity, VOCs) and RS-485 Mod-Bus protocol is favored by customers.

AQM-200 is designed for customers in US and Europe. And it is lockable and the mounting holes are configurable for US or European junction boxes.

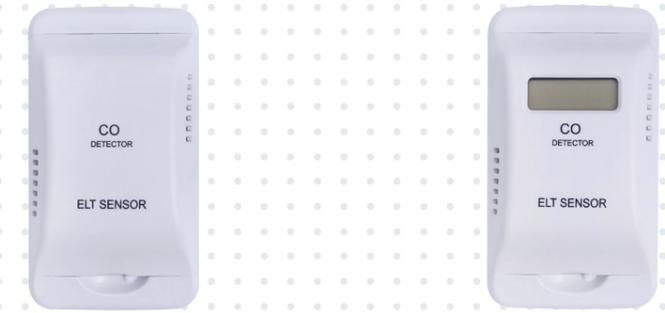


	AQM-100	AQM-200
Sensing Method	CO ₂ - NDIR (Non-dispersive Infrared) Single Type VOCs- Semiconductor Type Humidity, Temperature	
Dimensions	118mm x 74mm x 22mm (115g)	36.5mm x 85mm x 24mm (135g)
CO₂ Measurement range	0 to 10,000ppm	0 ~ 2,000/3,000/5,000/10,000ppm
Accuracy	±30ppm ±5%	±50ppm ±3% of Reading (ACDL Mode : ±30ppm ±3% of Reading)
Operating Temperature range	0°C to 50°C	-10°C ~ 60°C
Storage Temperature	-20°C to 60°C	-30°C ~ 70°C
Operating Humidity range	0 to 95% RH (Non-condensing)	
Input Power	12VDC	24VAC, 24VDC ± 20%, 50/60Hz (4 wire) 24VDC (12~36VDC) (3 wire)
Current Consumption	I _{avr} : 80mA, I _{pk} : 0.5 A	
Power Consumption	< 1 W	
Response Time (90%)	150 sec	None
Sampling Interval	3 sec	None
Output	RS232 (9600 BPS) RS485 (9600 BPS) (Modbus is option)	① 4~20mA & 2~10VDC ② 0~10VDC & 0~20mA ③ Relay output-Contact rating : 1A/120VAC or 1A/24VDC ④ RS485-Modbus
Other options	None	① VOCs ② CO ③ LCD Display

Ordering Code	Option List
AQM-100	RS232, RS485
AQM-100M	RS-485 Modbus
AQM-100(M)V	VOCs ('M' : RS-485 Modbus - optional)
AQM-100MV-HT	VOCs, RS-485 Modbus, Temperature, Humidity
AQM-200(M)	CO ₂ , Temperature, Humidity ('M' : RS-485 Modbus - optional)
AQM-200(M)V	CO ₂ , Temperature, Humidity, VOCs ('M' : RS-485 Modbus - optional)
AQM-200(M)VC	CO ₂ , Temperature, Humidity, VOCs, CO ('M' : RS-485 Modbus - optional)

COD-200, COD-200-HC

COD-200 is the CO(Carbon monoxide) Transmitter which detect CO gas in the air and send signal to Host, alarming people about hazardous CO gas at parking lots, Industrial working places and Buildings. COD-200-HC gives wider reading range up to 1,000ppm with better accuracy and stability as well.



	COD-200	COD-200-HC
Sensing Method	Semiconductor Type	
Dimensions	123mm x 69mm x 40mm (115g)	
CO Measurement range	0 to 250 ppm (0 to 100/300 ppm is option)	0 to 500 ppm (0 to 1,000 ppm is option)
Accuracy	At 20°C, 50%RH after 4days since power-on. 0~100ppm : ±5% FS 100~250/300 : ±10% FS	At 20°C, 50%RH after 4days since power-on. 0~100ppm : ±10% FS 100~500/1,000 : ±15% FS
Operating Temperature range	-10°C to 50°C	
Storage Temperature	-30°C to 60°C	
Operating Humidity range	10 to 90% RH (Non-condensing)	
Input Power	24VDC (3-Wired) or 24VAC/24VDC (4-Wired)	
Response Time (90%)	< 1 minutes	
Sampling Interval	every 30 sec	
Output	4 ~ 20mA & 2 ~ 10VDC, RS485 Modbus (Optional)	
Other options	'L' : with LCD display	

Ordering Code	Option List
COD-200, COD-200-HC	without LCD
COD-200L, COD-200L-HC	with LCD
COD-200M, COD-200M-HC	with Modbus, without LCD
COD-200ML, COD-200ML-HC	with Modbus, LCD

CO₂ Duct Transmitter

DUT-1000/2000(HT), P-1000/2000

DUT-1000, 2000 are Duct type Transmitter models with single / Dual Beam CO₂ Sensor operating with 3 wire / 4 wire & Relay, they give 4-20mA Current output / 2-10V Voltage output with jumper selection and support RS485 ModBus protocol. P-1000 is a transmitter type CO₂ sensor which can measure high concentration of CO₂ up to 25%. And it can be operated in sealed condition like CA containers for freshly preserving storage or other mission-critical applications such as Incubators.



	DUT-1000 / DUT-2000	P-1000	P-2000
Sensing Method	NDIR (Non-dispersive Infrared) (DUT-2000 : Dual Type)	NDIR (Non-dispersive Infrared)	NDIR (Non-dispersive Infrared)
Dimensions	Mainboard Box : 85mm x 115mm x 49mm Duct tube : 290mm x 26Ø (DUT-1000) 290mm x 50Ø (DUT-2000)	35φ (Screw : 45φ) x 62mm	Mainboard : 85mm x 115mm x 45mm Duct Probe : 246mm x 40Ø
CO₂ Measurement range	0 to 2,000ppm (3K, 5K, 10Kppm are available) (20K, 30K, 50K optional)	0 ~ 25% (5%/10%/15%/20% are available)	0 ~ 20% (5%, 10%, 15%, 20%, 25% are available)
Accuracy	DUT-1000 : ±50ppm ±3% of Reading (ACDL operation) DUT-2000 : ±30ppm ±3% of Reading	±0.03%(300ppm) ±3% of Reading	0.1%(1000ppm) ± 3% of reading
Operating Temperature range	DUT-1000 : 0°C to 50°C DUT-2000 : -10°C to 50°C	-10°C ~ 60°C	-10°C ~ 60°C
Storage Temperature	-30°C to 70°C		
Operating Humidity range	DUT-1000 : 0 to 95% RH (Non-condensing) - Buildings DUT-2000 : 0 to 99% RH (Non-condensing) - Green House	0 to 95% RH (Non-condensing)	0 ~ 99 % RH (Non-condensing)
Input Power	24VAC, 24VDC ± 20%, 50/60Hz - 3 Wire, 4 Wire (order selection)	12V or 5V (DC)	24VAC/DC, ±20%, 50/60Hz, 3wire, 4 wire ※ Power : no polarity connection
Response Time (90%)	120 sec		
Sampling Interval	3 sec		
Output	① 4~20mA&2~10VDC (Jumper selectable) ② RS485-Modbus ③ Relay (1A : 120V AC, or 24V DC)	① 4~20mA ② I2C : Slave ③ UART - 38,400BPS, 8bit, No parity, 1 stop bit TTL Level	① 4~20mA & 2~10VDC ② RS485 Mod-bus protocol ③ Relay (1A : 120V AC, or 24VDC)
Other Option	'L' : with LCD display	None	None
Temperature sensor	0°C to 65°C ±0.4 °C (Optional : -20°C to 0°C ±0.7 °C)	None	None
Humidity Sensor	Accuracy 10% to 90% ±4% RH (Optional : under 10%, over 90% ±7% to ±8% RH)	None	None

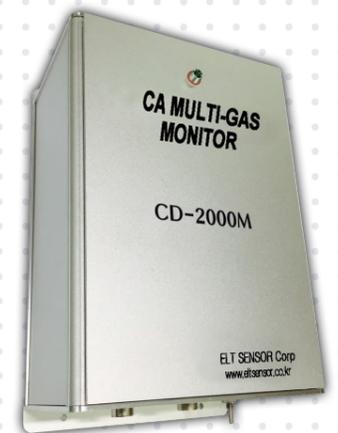
Ordering Code	Option List
DUT-1000/2000-3W	without LCD, 3 wired
DUT-1000/2000-4W	without LCD, 4 wired
DUT-1000/2000L-3W	with LCD, 3 wired
DUT-1000/2000L-4W	with LCD, 4 wired
P-1000	4-20mA, UART, I2C
P-2000	4-20mA, 2-10VDC, RS485-Modbus, Relay

Multi-Gas Monitor

CD-2000M

CD-2000M is RS485-ModBus supporting transmitter to measure various gases let alone Temp. & Humid. which could operate in CA storage or other mission-critical applications.

Sensing Method	"CO ₂ - NDIR (Non-dispersive Infrared) Single Type O ₂ - Fluorescence-based Optical Oxygen Sensor C ₂ H ₄ - Electro Chemical Ethylene Sensor"
Dimensions	180mm×290mm×135mm
Measurement range	"CO ₂ : 0 to 25% O ₂ : 0 to 25% C ₂ H ₄ : 0 - 10ppm Temp : -30°C to -70°C Humidity : 0 to 100%"
Accuracy	"CO ₂ : ±3% of Reading O ₂ : 0.1% C ₂ H ₄ : 0.2ppm Temp : ±1% Humidity : ±2% RH"
Resolution	CO ₂ : 1 ppm O ₂ : 0.01 % C ₂ H ₄ : 0.1 ppm"
Operating Temperature range	-20°C to 50°C
Storage Temperature	5°C to 20°C (Recommended for C ₂ H ₄)
Operating Humidity range	0 to 95% (±5%, RH)
Input Power	DC 24V/1A
Response Time (90%)	< 60 sec
Output	RS485 - ModBus, Baudrate 9600bps



CO₂ USB Monitor

MT-200, PAM-100

MT-200 series is world's smallest CO₂ Monitor connectable to PC or Mobile phone Cars through USB Interface.

PAM-100 is a portable air-quality monitor which detects CO₂, VOCs, Temp., R.H., and users can monitor current values in the room through ELT's apps which communicate via bluetooth.



Sensing Method	NDIR (Non-dispersive Infrared) / USB Type
Dimensions	MT-100 : 19.4mm x 55.6mm x 10.3mm PAM-100 : 70mm x 30mm x 22mm
CO₂ Measurement range	0 to 10,000ppm (5%/10% models are available) - Optional
Accuracy	±70ppm ±3% of reading for 400~10,000 ppm
Operating Temperature range	0°C to 50°C
Storage Temperature	-30°C to 70°C
Operating Humidity range	0 to 95% RH (Non-condensing)
Input Power	3.5VDC ~ 5.2VDC (USB)
Power consumption	Normal : 20mA Max : 230mA Sleep : 0.5mA
Response Time (90%)	65 sec
Sampling Interval	3 sec
Output	USB to PC, Notebook, Mini USB to Smart phone

Ordering Code	Option List
MT-200	USB CO ₂ Module
PAM-100	CO ₂ , VOCs, Temp., R.H., Monitors

Air Quality Monitor

MB-350U, MB-350U-V, MB-350U-C

MB-350U-V is the USB Monitor type model base on B series CO₂ sensor, which shows CO₂ level on the screen. It can be easily monitored for Temperature, humidity and VOCs not only CO₂ level (option) so can be applied to the places where are needed to check the air quality like schools, public offices, hospitals and so on.

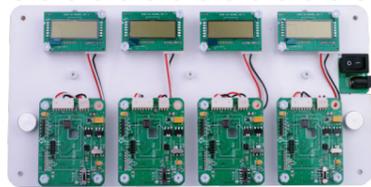


	MB-350U	MB-350U-V	MB-350U-C / MB-350U-C-V
Sensing Method	CO ₂ - NDIR (Non-dispersive Infrared) Single Type Humidity, Temperature	CO ₂ - NDIR (Non-dispersive Infrared) Single Type VOCs- Semiconductor Type Humidity, Temperature	CO ₂ - NDIR (Non-dispersive Infrared) Single Type CO- Semiconductor Type Humidity, Temperature
Dimensions	135mm x 90mm x 27.5mm		
CO₂ Measurement range	0 to 10,000 ppm		
CO₂ Accuracy	±30ppm ±3%		
Operating Temperature range	-10°C to 60°C		
Storage Temperature	-20°C to 70°C		
Operating Humidity range	0 to 95% (±5%, RH)		
Input Power	DC 12V/1A AC/DC adaptor		
CO₂ Step Response Time(90%)	150 sec		
CO₂ Sampling Interval	3 sec		
CO₂ Output	LCD display, LED display (Very high / High / Normal), Alarm: Melody warning USB output	LCD display, Alarm: Melody warning, USB output	LCD display, Alarm: Melody warning, USB output
VOCs Output	without VOC	Very high / High / Normal LED indicate	without VOC
CO Output	without CO	without CO	Very high / High / Normal LED indicate LCD display

Ordering Code	Option List
MB-350V	MB-350U-V without USB connection
MB-350U-485	RS-485 Modbus support is added on MB-350U
MB-350U-V-485	RS-485 Modbus support is added on MB-350U-V
MB-350U-C-485	RS-485 Modbus support is added on MB-350U-C
MB-350U-C-V-485	RS-485 Modbus support is added on MB-350U-C-V

TRB-100ST

TRB Series enable engineers or customers to Test and Recalibrate sensors as needed in customer side, saving time and cost of returning sensors to Manufacturer.



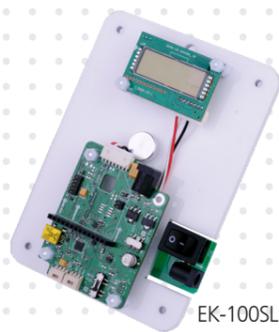
Supporting products	S-Type (S-110, S-300E, S-300, S-300-3V, D-300, D-300-3V, CH4-D3)
	T-Type (T-110, T-110-3V, MT-100)
Usage	It can be used as incoming test, long-term test tool for various S-series and T-series sensors.
	Test with LCD Display, Re-Calibration is executable with switch setting.
Merit	Customers can easily check the accuracy of 4 different sensors through LCD display.
	It save time and cost by customers' enabling on-site sensor check and re-calibration.
Recalibration Function	MCDL (Factory set status or manually updated status in customer side) or ACDL (Periodic Auto-Recalibration) is executable with switch setting as needed.
Power Supply	Input: 100~240V 50Hz/60Hz, 1.5A, Output : 12V 3A (AC/DC Adapter is provided as default)

Ordering Code	Option List
TRB-100SH	S-100H (12V) series is included instead of T-series of TRB-100ST.
TRB-100ST-20	Test and Calibrate 20 unit at a time.

EK-100SL, EK-100TL

EK-100 is designed for users to test, do Automatic / Manual Calibration with PC display through USB connection.

It enables even change or upgrade the mpu program of sensor in customer side if needed.



EK-100SL



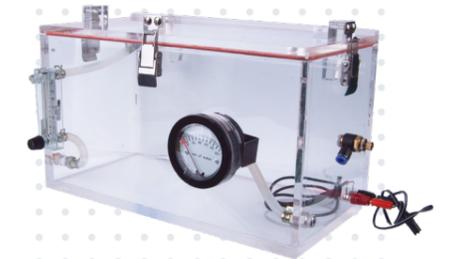
EK-100TL

Supporting products	EK-100SL : S-110, S-300E, S-300, S-300-3V, D-300, D-300-3V
	EK-100TL : T-110, T-110-3V, MT-100
Measuring Range Change	The default concentration setting can be changed to 2,000 / 3,000 / 5,000 / 10,000ppm, 2%/3%/5%/10% as needed.
Operating Mode Change	MCDL (Factory set status or updated status in customer side) or ACDL (Periodic Auto-Recalibration) can be upgradable.
Power Supply	Input : 100~240V 50Hz/60Hz 0.7A Output : 12V 1.5A (AC/DC Adapter is provided as default)

CMB-10

CMB-10 is designed for users to test and calibration the sensor modules with standard gas, which enable customer do Manual Calibration(MCDL) to make high accuracy with TRB-100 or EK-100 in this chamber.

Supporting products	Chamber volume : 10 Liter
	Materials : Acryl, 10mm thickness
	Size : 350mm x 200mm x 180mm(W, L, H)
Components	chamber, inlet valve, gas flowmeter, inside pressure guage, outlet valve, gas tube etc.
Purpose	Calibration or Test for sensors
Power Supply	Input : 12V 3A (AC/DC Adapter is provided as default)



Intellectual Property Rights

Patents	Design
18 Registered	8

Major Patents

	Patent Title	Number	Reg. Year
1	Optical Gas Sensor	494103	2005
2	Gas Cell with Two Parabolic Mirrors and Its Production	574615	2006
3	NDIR Gas Sensor	574616	2006
4	Optical Cavity for Multi-Gas Sensors	979991	2010
5	Optical Cavity for NDIR Gas Sensors	1026206	2011
6	NDIR Gas sensor with two independent optical path	1088360	2011
7	Total room controller for indoor air control system	822384	2011
8	Optical Cavity for Gas sensors	1788142	2017
9	Optical Gas Sensor	USA, JAPAN, CHINA	
10	GAS CELL USING TWO PARABOLIC CONCAVE MIRRORS AND METHOD OF PRODUCING GAS SENSOR USING THE SAME	JAPAN, CHINA, EUROPE	
11	Optical cavity for gas Sensor	USA, JAPAN, CHINA	