

Biodegradation Tester

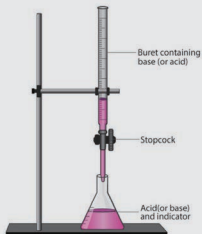


Advantages

- Advanced gas measuring system with Double Sensors (CO₂, etc.)
- Device independent control system
- High visibility alarm system
- Real-time display of test status and equipment status on 10-inch touch panel
- Sensor protection system
- Auto flow control system
- Automatic biodegradation calculation

Technical competency & Patents

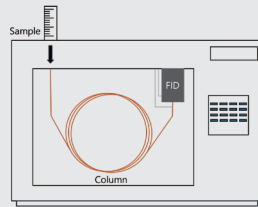
The Evolution of Carbon Dioxide measurement technology in Biodegradation Testers



Titration (1st Gen)

※ Titration

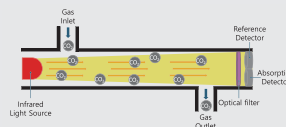
- Individual sampling devices per channel
- Manual measurement
- Significant time and manpower consumption for analysis



Gas Chromatography (2nd Gen)

※ GC - Flame Ionization Detector

- Sequential measurements with a single instrument for multiple channels (Cycle 3~4 times/day)
- Long measurement cycle leads to missing values
- Maintenance of heating devices and detectors is difficult



NDIR sensor (3rd Gen)

※ Non-Dispersive Infrared

- Sequential measurements with a single instrument for multiple channels (Cycle 1~4 times/hour)
- Reduction in missing values between measurement intervals
- Occurrence of missing values depending on the measurement range of the sensor
- Modular sensors for convenient maintenance



Advanced Gas Analysis System (4th Gen)

※ Advanced Gas Analysis System

- Sequential measurements with a single instrument for multiple channels (Cycle 1~4 times/hour)
- Utilization of **Double Sensors**
 - * Elimination of missing values caused by high-concentration sensors
 - * Improvement of measurement accuracy with low-concentration sensors
- Application of **Automatic flow control system** for optimal environmental conditions
- Patent registration number: 10-2661035

Double Sensors

- Using low and high concentration gas sensors
- Precise and accurate gas analysis

Independent control device

- In the event of a PC failure Maintain aerobic biodegradation test conditions with independent control of the device

Automatic flow control system

- Automatically adjusting the optimal flow rate based on the generated carbon dioxide concentration.

Sensor protection system



Patent Certificate



Biodegradation Tester

Features

| Double Sensors |

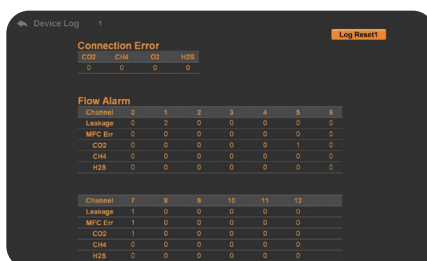
- Double Sensors is a necessary configuration to accurately monitor the various patterns of carbon dioxide generated in biodegradability tests by providing accurate measurement values through hardware optimization.
- It provides higher accuracy and precision than a single sensor at low concentrations and secures a wide measurement range without saturation at high concentrations.
- Automatic conversion based on the measured value of the generated carbon dioxide concentration improves user convenience and provides highly reliable data.

	Sensor	Maximum Range	Unit	Accuracy
Gas	CO ₂	500, 1 000, 2 000, 3 000, 5 000, 10 000, 30 000, 50 000	ppm	± 2 % of Range
	CH ₄	10 000, 50 000, 100 000	ppm	± 2 % of Range
	O ₂	25	%	± 1 % of Range
	Additional	H ₂ S, NO, NO ₂ , SO ₂ , $\delta^{13}\text{C}$ etc..		
Flow	MFM & MFC	100, 200, 500, 1 000	ml/min	± 1 % of Range

※ Changeable sensor measured range & MFC flow range

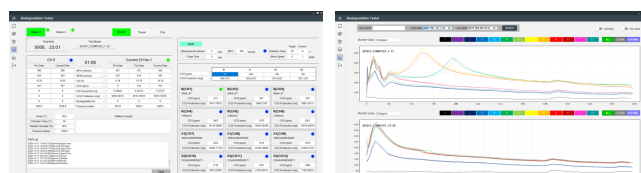
| Test environment stability |

- Real-time display of test status and equipment status on 10-inch touch panel
- Quickly identify and respond to test system issues using a high visibility LED lighting alarm system
- Establishing a uniform biodegradation test environment with a stable temperature distribution.
- In case of PC issues during long-term testing, the device independently controls and preserves the test conditions, ensuring the state of the test is maintained.
- Sensor protection system
- Automatic flow control system
 - ☞ Automatically adjusting the optimal flow rate based on the generated carbon dioxide concentration



| Data Analysis |

- Converting test data to excel (6hour, 12hour, 1day, All)
- Comparative analysis of trends between different test data using the data merge function.
- Database integration of inoculant and sample.
- Automatic calculation of biodegradability (Predicting the theoretical carbon emissions of CO₂ and CH₄ to calculate their biodegradability)



| Standards |

- ISO 14852 ; Aerobic Biodegradability of plastic materials in an aqueous medium
- ISO 14855-1 ; Aerobic Biodegradability of plastic materials under controlled composting conditions
- ISO 17556 ; Aerobic Biodegradability of plastic materials in soil
- ASTM D 5338, ASTM D 6691, OECD 301B, and others

Performance

| Recommended specifications |

	Standard			Premium		
Model name	ABA(CH)-SS	ABA(CH)-CS	ABA(CH)-LS	ABA(CH)-SP	ABA(CH)-CP	ABA(CH)-LP
Medium	Soil	Compost	Liquid	Soil	Compost	Liquid
MFC	200	500	200	200	500	200
CO ₂ Sensor quantities	Single	Single	Single	Double	Double	Double
CO ₂ Sensor	2 000	10 000	2 000	1 000	2 000	500
Double CO ₂ Sensor	N/A	N/A	N/A	5 000	10 000	2 000
CO ₂ Scrubber	Yes	No	Yes	Yes	No	Yes
Vessel type	Solid	Solid	Liquid Bottle	Solid	Solid	Liquid Vessel
Magnetic stirrer	No	No	Yes	No	No	Yes

※ Changeable sensor measured range & MFC flow range

| General Specifications |

Device & Chamber & System PC

- MFC controllable for each channel
- Forced convection chamber (temperature range : 5 ~ 70°C ± 1)
- Sensor : CO₂, O₂, temperature, humidity, pressure, flow
- Dual type NDIR CO₂ Sensor (accuracy FS ± 2 %)
- O₂ Sensor (range : 0 ~ 25%, accuracy ± 1 %)
- Special measurement system for low-flow & low-concentration conditions
- Control unit mainboard sensor ADC Resolution : 21bit
- Independent system operation by control unit MCU(32bit), RTOS
- LED alarm system on the front of control unit(leakage, overflow, etc.)
- System software
- * Control : chamber temperature, flow, operating parameters
- * Monitoring : flow, leakage, CO₂, O₂, temp. , humidity, pressure
- * Automatic flow control system
- * Data logger & Data merge (24Ch chart analysis)
- * Sample information & Result DB system
- * Calculated biodegradability
- Sensor protection system

| Accessories |



Solid Vessel



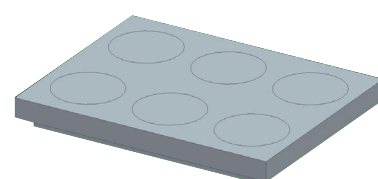
Liquid Vessel



Liquid Bottle



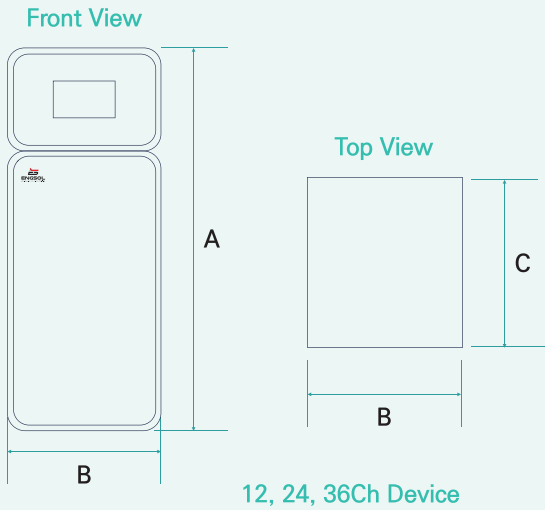
CO₂ Scrubber



Magnet Stirrer (6 Position)

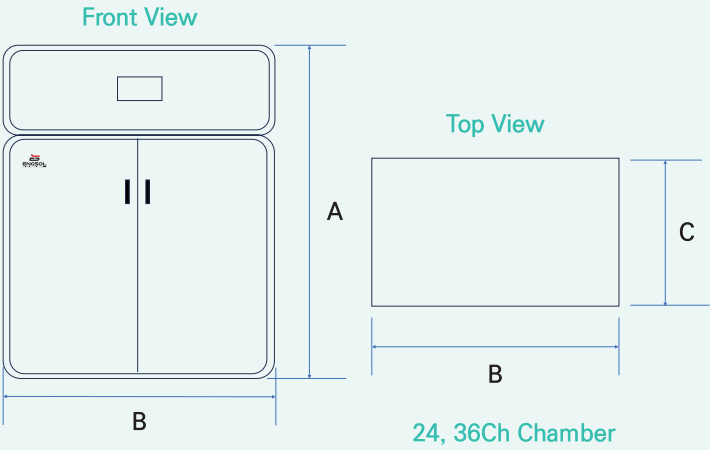
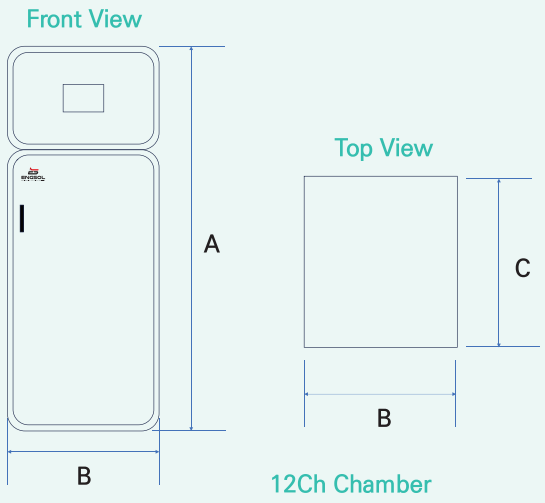
SIZE		
Device		
12, 24Ch	A	1 431
	B	600
	C	650
36Ch	A	1 829
	B	600
	C	650

Unit : mm



SIZE		
Chamber		
12Ch	A	1 716
	B	550
	C	740
24Ch	A	1 786
	B	954
	C	844
36Ch	A	2 116
	B	1 200
	C	844

Unit : mm



Power requirements	
Device	Chamber
12 Ch : 220VAC 1ph 60Hz 250 W	12 Ch : 220VAC 1ph 60Hz 1.5 kW
24 Ch : 220VAC 1ph 60Hz 500 W	24 Ch : 220VAC 1ph 60Hz 3 kW
36 Ch : 220VAC 1ph 60Hz 750 W	36 Ch : 220VAC 1ph 60Hz 5 kW



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