

Environmental Testing Apparatuses





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### BECOMING THE WORLD'S TOP MANUFACTURER IN TERMS OF TECHNOLOGY AND PRODUCT STRENGTH IN THE FIELD OF HEAT CYCLE TESTING

Environmental testing apparatuses are used in a wide range of fields, including semiconductors, electronic components, automotive components, and secondary batteries, and these systems must continue to evolve day by day to meet the needs of increasingly advanced development and research.

As samples become larger and climate change needs increase, COSMOPIA HIGHTECH will respond quickly to these changes and help our customers all over the world to develop cutting-edge technologies.



#### **Company profile**

Name	COSMOPIA HIGHTECH CORP.
Address	8-1, Shinmidori-cho, Shimizu-ku, Shizuoka-shi, Shizuoka
Established	August 22, 2023
Capital	¥100,000,000
Business	Manufacturing, design, sales,
	and after-sales service for
	environmental testing apparatuses



# Freeze control technology

Our heat cycle technology, which makes maximum use of our core competence of freeze control technology, utilizes scroll compressors to deliver efficient and stable performance at low temperatures. Scroll compressors use gas more efficiently than reciprocating compressors, allowing them to deliver stable cooling performance under constant temperature conditions and extremely low-temperature conditions down to -40° C.



# **COSMOPIA HIGHTECH values**

#### Purpose of our existence

A company is ultimately a public institution, and exists to meet the expectations of people and society.

This is certainly true of COSMOPIA HIGHTECH, and providing natural environments that are ever more accurate is our public mission.

We aim to increase our value as a means of making it easier to exchange values with stakeholders, and to help bring happiness to people.



#### **Company history**

- 1970 Began selling environmental testing apparatuses at Hitachi, Ltd.
- 1994 Transferred the environmental testing apparatus business from Hitachi, Ltd. to Hitachi Shimizu Engineering Co., Ltd.
- 2003 Changed the company name to Hitachi-kucho SE,Ltd
- 2018 Merged with Johnson Controls-Hitachi Air Conditioning
- 2023 Established COSMOPIA HIGHTECH CORP. Transferred the environmental testing business from Hitachi-Johnson Controls Air Conditioning, Inc. Began OEM production
- 2024 Began selling Cosmopia brand products



# cosmopia

Thermal Shock Testing Apparatuses

### Cosmopia environmental testing apparatuses deliver the features and reliability that our customers need now.

Environmental testing apparatuses are used in a wide range of fields including semiconductors, electronic components, and in-vehicle components, and these systems must continue to offer high functionality to meet the needs of increasingly advanced development and research. At the heart of COSMOPIA HIGHTECH is our scroll compressors, which deliver efficient and stable performance

At the heart of COSMOPIA HIGHTECH is our scroll compressors, which deliver efficient and stable performance at low temperatures.

Thermal Shock testing apparatuses are systems used to simulate the Thermal Shock of rapid temperature changes (cooling/heating) on samples, in order to conduct heat/cold shock testing to evaluate sample reliability. They are used in testing environments crucial for developing and testing semiconductors, automotive components, and other parts.



\*Photo for illustrative purposes only

#### How scroll compressors operate

Gas sealed in the sickle-shaped compressed air area formed between the fixed scroll and revolving scroll is compressed toward the center and discharged from the discharge port at the center.



### **Thermal Shock Testing Apparatuses**

	Cooling	Testing chamber		Testing tempe	erature range	Dagas
EXCELLENT SERIES	EXCELLENT SERIES Model (L)		Model	Low-temperature testing	High-temperature testing	rages
Air flow Type Thermal Shock	Water-cooling	70	ES-76EX	70 40 000	00 to 200°C	70
lesting Apparatus		200	ES-206EX	-70 to UC	80 to 200C	/-8
Liquid Type Thermal Shock	Air-cooling	5.6	ES-66EX-L	70 + - 0°C	70 +- 150%	0.10
lesting Apparatus		9.4	ES-96EX-L	-/0 to UC	70 to 150C	9-10

		Cooling	Testing chamber		Testing tempe	erature range				
STAN	IDARD SERIES	method	volume (L)	Model	Low-temperature testing	High-temperature testing	Pages			
Air flow Type	Thermal Shock	Air-cooling	47	ES-57L	70 to 0°C	60 to 200°C	11 14			
lesting Appara	atus Basic Type		105	ES-107L	-70 to 0C	60 to 200C	11-14			
Air flow Type	Thermal Shock	Water-cooling	74	ES-77LH						
High Performa	nce Type		105	ES-107LH			15 10			
			200	ES-207LH			12-10			
			305	ES-307LH						
	Air-Cooling Remote Condenser Type	Air-cooling	74	ES-77LH-R	−70 to 0℃	−70 to 0℃	−70 to 0℃	70 1 0°C	60 to 200°C	
			105	ES-107LH-R				500 60 to 2000	10.04	
			200	ES-207LH-R			19-21			
			305	ES-307LH-R						
	High Speed Type	Water-cooling	105	ES-107LHH			22.24			
			200	ES-207LHH			22-24			
Air flow Type Thermal Sho	ock Testing Apparatus MIL Standard Type	Water-cooling	70	ES-76LM	−70 to 0℃	60 to 200℃	25-26			
Air flow Type Thermal S	bock Testing Apparatus 250° C Type	Water-cooling	70	ES-76LM-M	70 to 0°C	60 to 250°C	27.20			
	Air-Cooling Remote Condenser Type	Air-cooling	72	ES-76LM-RM	-70 10 0 0	60 LO 250 C	27-20			
Air flow Type	Thermal Shock	Water-cooling	1,080	ES-1006L	E0 to 10°C	60 to 120°C				
High Capacity	Туре		1,450	ES-1506L	-5010-100	60 to 120 C				
			2,448	ES-2506L	−60 to 0℃					
			2,880	ES-2906L	65 to 0°C	60 to 130℃				
			3,130	ES-3106L	-65 10 0 C		29-31			
			5,438	ES-5506L	−50 to −10℃	60 to 120℃				
			1,080	ES-1006LH	−65 to 0℃	60 to 200℃				
	Air-Cooling Remote Condenser Type	Air-cooling	1,080	ES-1006L-R	E0.44 10°C	(0 to 100°C				
			1,450	ES-1506L-R	-50 to -10C	60 to 120C				

Air flow Type Liquid Type EXCELLENT SERIES EXCELLENT SERIES

## **Cosmopia Thermal Shock Testing Apparatuses**

### **EXCELLENT SERIES**

#### Air flow Type Thermal Shock Testing Apparatus

#### 1,000 cycles with no defrosting (model ES-76EX)

Turne	Cooling	Testing chamb	per volume (L)
туре	method	70	200
EXCELLENT (Air flow Type)	Water-cooling	ES-76EX	ES-206EX

Temperature cycle operation for 1,000 cycles with no defrosting (ES-76EX with 70 L testing chamber). \*500 cycles with no defrosting for ES-206EX with 200 L testing chamber.

#### Liquid Type Thermal Shock Testing Apparatus

#### Uses liquid heat medium for rapid sample temperature changes

Turne	Cooling	Testing cham	per volume (L)
туре	method	5.6 9.4	
EXCELLENT (Liquid Type)	Air-cooling	ES-66EX-L	ES-96EX-L

Reduced heat medium liquid consumption.

#### **STANDARD SERIES**

Basic Type Air flow Type

100-cycle continuous operation with a stainless steel exterior

Tuno	Cooling	Testing chamber volume (L)		
туре	method	47	105	
Basic	Air-cooling	ES-57L	ES-107L	

#### High Performance Type Air flow Type

#### High Performance Type with inverter control

Туре		Cooling		ber volume (L)		
		method	74	105	200	305
High Pe	erformance	Water-cooling	ES-77LH	ES-107LH	ES-207LH	ES-307LH
	Air-Cooling Remote Condenser	Air-cooling	ES-77LH-R	ES-107LH-R	ES-207LH-R	ES-307LH-R
	High Speed	Water-cooling	—	ES-107LHH	ES-207LHH	_





ES-207LH





ES-66EX-L

\*Photo for illustrative purposes only

\*Photo for illustrative purposes only

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#### MIL Standard Type Air flow Type

#### Compliant with MIL standard testing

Тиро	Cooling	Testing chamber volume (L)	
туре	method	70	
MIL Standard	Water-cooling	ES-76LM	

\*MIL standard: Standard for environmental resistance testing that establishes specifications for materials procured by the U.S. Department of Defense.

ES-76LM (Optional specification shown in photo) [Temperature recorder]

ES-76LM-M (Water-cooling) (Optional specification

shown in photo) [Temperature recorder]



#### 250°C Type

### Capable of higher high-temperature testing temperatures

Air flow Type

Туре		Cooling	Testing chamber volume (L)
		method	72
250℃		Water-cooling	ES-76LM-M
	Air-Cooling Remote Condenser	Air-cooling	ES-76LM-RM

Increased high-temperature testing temperature makes it possible to conduct the heat resistance evaluation testing required for conducting evaluation testing of power semiconductors\* (200 to  $250^{\circ}$  C).

\*Power semiconductor: A generic term for semiconductors used to control and supply power by converting AC to DC or by lowering the voltage from 5V to 3V to drive motors, charge batteries, or drive microcomputers and LSIs.

#### High Capacity Type Air flow Type

#### Higher testing room capacity for large samples

Tune	Cooling			Testing cham	ber volume (L	)	
туре	method	1,080	1,450	2,448	2,880	3,130	5,438
High Capacity	Water-cooling	ES-1006L ES-1006LH	ES-1506L	ES-2506L	ES-2906L	ES-3106L	ES-5506L
Air-Cooling Remote Condense	r Air-cooling	ES-1006L-R	ES-1506L-R	_	_	_	_





\*Photo for illustrative purposes only



\*Photo for illustrative purposes only

#### Cosmopia EXCELLENT SERIES

# Air flow Type Thermal Shock Testing Apparatus

### 1,000 cycles with no defrosting (model ES-76EX)

#### Significantly lower development testing times<sup>\*1</sup> and power consumption<sup>\*2</sup>

Can reduce testing times by approximately 30%\*1

- and uses approximately 25% less power.\*2
- (Compared with Cosmopia MIL Standard Type)
- Temperature cycle operation for 1,000 cycles with no defrosting.
- (Two zones, low/high-temperature testing time 15 min. each, testing chamber door not opened/closed)
- Testing times: 4,300 min. (MIL Standard Type ES-76LM), 3,000 min. (EXCELLENT SERIES ES-76EX)
   Power consumption: 11,316 kWh (Cosmopia MIL Standard Type ES-76LM), 8,500 kWh (EXCELLENT SERIES ES-76EX)
- \*500 cycles with no defrosting for ES-206EX with 200 L testing chamber.

*500 cycles with no defrosting for ES-206EX with 200 L testing chamber.			
Lineup			
Cooling Testing chamber volume (L)			
Туре	method	70	200
EXCELLENT (Air flow Type)	Water-cooling	ES-76EX	ES-206EX



Photo for illustrative purposes only.

#### Significantly lower development testing times and power consumption (model ES-76EX)



#### **Temperature cycle operation for 1,000 cycles with no defrosting!**

<Operation conditions> -65° C/15 min., 150° C/15 min.
(Defrosting performed every 10 cycles for MIL Standard Type)

#### Standard-equipped with a range of functions for enhanced ease of use

Function	Contents
End condition setting	Allows the selection of end conditions after the temperature cycle operation has ended. •Stop after drying operation •Stop after room temperature operation •Stop after defrosting operation •Preparation operational status
Operation mode setting	Allows the operation mode to be set based on testing. •Energy saving •Standard •High load •Reduced power operation
Trend graph	Displays trend graphs (with scrolling).
Test pattern name input	Allows names to be registered to test patterns (up to 10 alphanumeric characters).
Timer	•Allows operation to start/stop on a timer in one of three modes (once, daily, or day of the week).
Cycle suspension	Allows an operation to be suspended after the specified number of cycles.
Notepad	Allows notes (text, sketches, etc.) to be written on the LCD panel.

#### Options

Item	Specification		Item	Specification	
Temperature recorder	Select either paperless or a paper chart (100 mm width; 1 pen, 6 dots).		Internal air compressor	Air compressor output 0.2 kW	
Emergency stop switch	Shuts power down via the earth leakage circuit breaker.		Power supply terminal block	For three phase $2001/0.2$ $k/0/0$ or $0.4$ $k/0/$	
Communication interface	Select either RS-232C, RS-485, or web interface (including Ethernet).		for air compressor connection	For tillee-pliase 2000 0.2 kw of 0.4 kw	
Communication interface cable	RS-232C: 4m, 10m		Cycle counter	Eight digits, with or without reset function	
Cable hole	$\phi$ 50mm $ imes$ 1, added to standard cable hole (left side surface) area		Signal indicator	Three colors (Green: Operating, Yellow: Power supply, Red: Error)	
Sensor switching function	Select either upwind side or downwind side for the testing chamber temperature control point (can be switched).		Sample temperature monitor system	Begins testing time count based on the measured surface temperature of the sample	
			Expanded high-temperature	Testing temperature range 60 to 200° C	
*We offer a wide range of options to suit various needs. (Refer to P33 through P36		6.)	testing temperature range		

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#### Specification table

Category			egory		EXCELLENT SERIES (Air flow Type	Thermal Shock Testing Apparatus)	
ltem N			Λ	Nodel	ES-76EX	ES-206EX	
Туре		_	Stationary sample type, cool/hot air s	witchable, two/three zone switchable			
	Te	esting tempe	erature range	_	Low-temperature testing: -70 to 0°C, H	ligh-temperature testing: 80 to 200℃	
	Te	mperature flu	ctuation margin	°C	±(	).5	
	(h	Temperatu igh-tempera	re rise time ture chamber)	—	Room temperature to 200°C: Within 25 min.		
Perfc	(	Temperatur low-tempera	e drop time ture chamber)	-	Room temperature to	-75°C: Within 70 min.	
m	Ten	Сус	les *2	—	Continuous operation cycles possible: 1,000	Continuous operation cycles possible: 500	
lanc	Ipera:	Testing chamber	High temperature	_	+150°C/15 min.	+125℃/30 min.	
e	ture o	/ Testing time	Low temperature	_	−65℃/15 min.	−40°C/30 min.	
	ycle	Temperature me	asurement position	_	Downw	ind side	
	perf	Sampla	Туре	_	Plastic molded IC	Plastic molded IC	
	orma	Sample	Weight	_	5 kg (IC 3.5 kg + single-stage jig 1.5 kg)	10 kg (IC 5.5 kg + single-stage jig 4.5 kg)	
	Ince	Temperature	return time *1	_	Within 5 min.	Within 5 min.	
Permissible sample weight inside testing chamber		_	Max. 30 kg (floor surface 20 kg or less, sample shelf 5 kg or less [per shelf])	Max. 50 kg (floor surface 40 kg or less, sample shelf 11 kg or less [per shelf])			
Testing chamber volume		L	70	200			
Т	acti	ng chamber	Width	mm	315	630	
	di	mensions	Depth	mm	495	690	
	un	Ticlisions	Height	mm	460	460	
	Width		mm	1,565	1,625		
Pr	odu	ct dimensions	Depth	mm	1,640	1,800	
			Height	mm	1,980		
		Exteri	or	_	Dark gray finish		
		Cooling m	nethod	-	Water-cooling, dual refrigeration, refrigerant: R404A	(high-temperature side), R23 (low-temperature side)	
		Safegui	ards		Earth leakage circuit breaker, electric motor overload safeguard, electrical fuse, excess temperature increase prevention system,		
		Jaiegua	105		operation with door open prevention switch, temperature fuse, and high-voltage shutdown system for refrigerator		
		Accesso	ories	—	Cable hole rubber plug $\times$ 1, sample shelf $\times$ 2, shelf support $\times$ 4, operati	on circuit protection fuse $\times$ 2, instruction manual $\times$ 1, and Y strainer $\times$ 2	
Operational noise dE		dB(A)	6	5			
D	ry a	air	Pressure	MPa	0.4 te	o 0.7	
			Consumption	L(ANR)	Approx. 7.6	6 per cycle	
		Coola	int	L/h	Volume: 4,200 (coolant inlet temper	rature 32°C), Pressure: 0.1 to 0.5 MPa	
		Power s	upply	-	Three-phase 200V 50/60Hz, Three-pha	se 220V 60Hz, Three-phase 380V 50Hz	
Ma	aximur	n load power supply /	[Power supply capacity]	A/kVA	120	/ 42	
		Product v	veight	kg	1,600	1,650	

Notes: 1. Can be operated in an ambient temperature from 0 to 40°C, a coolant inlet temperature from 5 to 38°C, and a power supply voltage within ±10% rated voltage. However, continuous operation will be limited as described in Note 4.
 2. Performance values are given under these conditions: (1) ambient humidity of 23°C/60% or less, coolant inlet temperature of 25°C, and The power supply voltage is within ±5% of the rated voltage. However, conditions will vary for the following:

 \*1: The temperature return time is the point in time where the temperature reaches ±2°C of the set high temperature or low temperature.
 \*2: The listed number of cycles available for continuous operation assumes no testing cycle supension and no testing tank door opening/closing.

 3. The maximum load current is the value at an ambient temperature of 20°C, coolant inlet temperature of 25°C, and the specified power supply voltage.
 4. When using continuous operation, be sure to perform defrosting with the following guidelines in mind.<sup>12</sup>

 (1) Two-zone operation: This testing apparatus can be set to continuous operation for up to 1,000 cycles (but only for up to 500 hours). However, ambient temperature conditions or usage conditions could cause frost to form on the low-temperature tank cooler, preventing continuous operation. In such a case, set a shorter continuous operation every 12 to 24 hours at maximum (but only once per 10 to 20 cycles maximum). These are recommendations for continuous operation every 12 to 24 hours at maximum (but only once per 10 to 20 cycles maximum). These are recommendations for continuous operation, and are not meant to guarantee temperature cycle performance. Excessive continuous operation could cause frost to form on the cooler inside the low-temperature cycle performance. Excessive continuous operation could cause frost to form on the cooler inside the low-tem

#### Dimensions

#### ES-76EX•ES-206EX





Model	а	b
ES-76EX	1,565	1,640
ES-206EX	1,625	1,800

Note: Casters and level adjusters are equipped as a standard.

(Unit: mm)

#### Cosmopia EXCELLENT SERIES

# Liquid Type Thermal Shock Testing Apparatus

# Applies temperature changes to samples even more rapidly than Air flow Type

Samples are alternately soaked in high-temperature and low-temperature heat medium liquids. The system uses a liquid heat medium, allowing it to rapidly change sample temperature.

# Reduced heat medium liquid consumption

The smaller testing chamber reduces heat medium liquid evaporation, while the increased airtightness of the chamber reduces external leaks.

The heat medium liquid steam recovery system efficiently recovers and reuses steam, so that the system consumes less heat medium liquid.

Lineup				
Type	Cooling	Testing chamber volume (L)		
	method	5.6	9.4	
Liquid Type Thermal Shock	Air-cooling	ES-66EX-L	ES-96EX-L	

#### Long-term continuous operation

The system is capable of continuous operation at 4,000 cycles. (Sample time: Cycles between 5 min. at high temperature and 5 min. at low temperature)



All settings and switches accessible from the LCD control panel



#### Reduced space

The system installation space has been significantly reduced. (21% less than previous Cosmopia model ES-66EX-L [16,900 cm2] and previous model ES-65L-L [21,560 cm<sup>2</sup>]) Photo for illustrative purposes only.

#### Heat medium liquid consumption over 1,000 cycles



Testing conditions — High-temperature testing: 150°C/5 min. Low-temperature testing: -65°C/5 min. Sample: Plastic molded IC (2 kg) Heat medium liquid: Galden DO2TS (186 kg) (door not opened/closed)

Note: Will vary depending on testing conditions and how often the door is opened/closed.

#### Standard-equipped with a water separation system

Separating and ejecting water mixed in heat medium liquid is as easy as pressing a switch.

#### Easier heat medium liquid filling (optional)

The auto heat medium liquid filling system (optional) automatically fills heat medium liquid without stopping testing. Simply fill the spare tank with liquid ahead of time.

Function			
Function	Contents		
End condition setting	Allows the selection of end conditions after the temperature cycle operation has ended. •Stop after room temperature return operation •Stop after defrosting operation •Preparation operational status		
Trend graph	Displays trend graphs		
Test pattern name input	Allows names to be registered to test patterns (up to 10 alphanumeric characters).		
Timer	•Allows operation to start/stop on a timer in one of three modes (once, daily, or day of the week).		
Cycle suspension	Allows an operation to be suspended after the specified number of cycles.		
Notepad	Allows notes (text, sketches, etc.) to be written on the LCD panel.		

#### Specification table

Category			egory		EXCELLENT SERIES (Liquid Type Th	nermal Shock Testing Apparatuses)	
Item Model		Nodel	ES-66EX-L	ES-96EX-L			
Туре —		-	Sample basket suspension transport liquid Type, two zones				
Testing temperature range °C		°C	Low-temperature testing: -70 to 0,	High-temperature testing: 70 to 150			
	-	Temperature flu	ctuation margin	°C	±	=2	
-		Temperatu high-tempera	re rise time *1 ture chamber)	1	Room temperature to 150°C: Within 90 min.	Room temperature to 150°C: Within 120 min.	
Jerto		Temperatur (low-tempera	e drop time *1 ture chamber)	1	Room temperature to $-65^{\circ}$ C: Within 90 min.	Room temperature to $-65^{\circ}$ C: Within 120 min.	
m		C)	vcles	-	25 cycles (low-te	emperature start)	
and	m	Comple	Туре	-	Plastic m	nolded IC	
l e	lera	Sample	Weight	-	2.6 kg (IC 2.0 kg + sample basket 0.6 kg)	3.0 kg (IC 2.0 kg + sample basket 1.0 kg)	
*2	atu	Test	zones	-	Low/high to	emperature	
	re cyc	Testing chamber temperature	Low/high temperature	°	-65. <sup>°</sup>	/ 150 <sup>+5</sup>	
	6	Testi	ng time	min	1	5	
		Sample basket	transport time	seconds	1	0	
		Exterior coat	ting color	-	Dark gr	ay finish	
			Width	mm	1,300		
F	Prod	uct dimensions	Depth	mm	1,300	1,400	
			Height mm		1,9	982	
Sa	·	Volume		L	5.6	9.4	
mp			Width	mm	18	85	
d al	.   C	Dimensions	Depth	mm	200	300	
last			Height	mm	150	170	
(et	A Loadable sample weight *4		kg	4	4		
		Refrigeration	n method	-	Air-cooling, dual refrigeration		
		Refrige	rant	-	Dual high-temperature side: R404A, Dual low-temperature side: R23		
		Equipm	nent	-	Casters, level adjusters		
		Safegua	ards	-	Earth leakage circuit breaker for power supply, electric motor overload safeguard, high-voltage shutdown system for refrigerator, float switc excess temperature increase prevention system (for samples), operation with door open prevention switch, and fuse		
		Accesso	ories	- 1	Sample basket $\times$ 1, fuse $\times$ 2	2, and instruction manual $\times$ 1	
Type		-	One-component of	or two-component			
Heat medium liquid		medium liquid	For high-temperature chamber	-	Galden D02TS (approx. 76 kg): 43 L (at 25°C)	Galden D02TS (approx. 90 kg): 51 L (at 25℃)	
			For low-temperature chamber	-	Galden D02TS (approx. 110 kg): 62 L (at 25°C)	Galden D02TS (approx. 130 kg): 73 L (at 25℃)	
			For water separator	-	Galden D02TS (appro	x. 3.5 kg): 2 L (at 25°C)	
		Power si	upply	-	Three-phase 200V 50/60Hz, Three-pha	ise 220V 60Hz, Three-phase 380V 50Hz	
1	Naxin	num load current*3/ F	ower supply capacity	A/kVA	47,	/ 16	
Product weight		kg	760 (not including heat medium liquid weight)	820 (not including heat medium liquid weight)			

Notes: 1. Can be operated in an ambient temperature from 0 to 40°C and with a power supply voltage within ±10% rated voltage.
 2. Performance values are given under these conditions: (1) ambient temperature from 10°C to 30°C, ambient humidity of 60% or lower, and (2) power supply voltage within ±5% rated voltage. However, conditions will vary for the following:

 \*1: Values given for temperature rise time and temperature drop time are at an ambient temperature of 20°C,

a values given for taken power supply voltage, and all chambers operating as standalones.
3. The maximum load current is the value at an ambient temperature of 20°C and the specified power supply voltage.
4. The loadable sample weight does not include the weight of the sample basket.
5. Heat medium liquid is not included. The listed heat medium liquid must be purchased separately. One-component heat medium liquid is recommended, because it does not require fractional distillation.
6. Water, oxygen, and other substances will accumulate within the testing chamber during testing. A separate filter system should be purchased and the heat medium liquid to the heat medium liquid to the heat medium liquid testing. medium liquid should be periodically cleaned.

#### 

Item	Specification	
Temperature recorder	Select either paperless or a paper chart (100 mm width; 1 pen, 6 dots).	
Communication interface	Select either RS-232C, RS-485, or Ethernet.	
Communication interface cable	RS-232C: 4 m, 10 m	
Cycle counter	Eight digits, with or without reset function	
Signal indicator	Three colors (Green: Operating, Yellow: Power supply, Red: Error)	
Water-cooling specification	Replaces condenser with water-cooling	
Water separation system	Removes water from the heat medium liquid in the low-temperature chamber	
र्भ Auto heat medium द्वीliquid filling system	Automatically fills the low-temperature chamber when the amount of heat medium liquid is low	
B High-temperature specification	High-temperature testing temperature range: 70 to +200°C	
Sample temperature measurement terminal	For T thermocouple, 1 or 5 points	

\*We offer a wide range of options to suit various needs. (Refer to P33 through P36.)

#### Dimensions





ES-66EX-L

ES-96EX-L

1,300

1,400

# **Basic Type**

Air flow Type

## 100-cycle continuous operation with a stainless steel exterior.

Lineup				
Turne	Cooling	Testing chamber volume (L)		
туре	method	47	105	
Basic	Air-cooling	ES-57L	ES-107L	



Photo for illustrative purposes only.

(Includes optional specifications [temperature recorder, emergency stop switch, and cycle counter])

#### New functions

#### USB storage saving function

Trend graph data can be saved to a USB storage device. This function saves data from trend graphs displayed on the LCD control panel (temperature measurements) to a USB storage device as CSV files.



#### Data log function

#### Cycle data

This function saves cycle data during operation to a USB storage device.

#### **Back-tracing**

If the system stops with an alarm due to an error being detected, this function saves the operational status of the system immediately prior

デ	ータログ \_	<u>(戻る)(ビュー)</u>
🔊 サイ:	クルデータ	
🔊 パッ:	クトレース	
	2000 / 0 / 0	0:00 書出し
	2000 / 0 / 0	0:00 書出し
	2000 / 0 / 0	0:00 書出し
	停止中	糚

to stopping, to a USB storage device. This data can be used for diagnosis and analysis.

#### Casters, level adjusters

Casters (for transporting the system) and level adjusters come equipped as a standard.

#### 100-cycle continuous operation

Capable of operating for 100 cycles with no defrosting during two-zone operation (cycles between low-temperature testing and high-temperature testing).

#### **Testing conditions:**

Low-temperature start, reduced power operation 2 function disabled (Control point: Upwind control) Low temperature : -40°C/30 min. High temperature : 125°C/30 min. Sample : ES-57L: 3.5 kg ES-107L: 5 kg

(Includes weight of plastic molded IC and sample loading jig) Ambient temperature : 20°C, ambient humidity 50% RH or lower Power supply voltage : Within  $\pm$ 5% rated voltage

\*100-cycle continuous operation may not be possible under other testing conditions.

#### New exterior design

The new design features a stainless steel (hairline finish) exterior with clear covers attached to the left and right of the system.

#### Signal external output terminals

Comes standard-equipped with time signal, sample power supply, and external alarm output terminals.

#### Communication interface

Comes standard-equipped with RS-232C interface functionality (connection cable available as option).

#### Equipped with highly visible, user-friendly color LCD touch panel

All settings and switches are accessible from the LCD control panel.

#### Language switching function



The language used for the LCD control panel can be changed on the control panel.

Four languages are supported (Japanese, English, Chinese [simplified], and Korean).

### Pattern combinations



Up to three test patterns can be combined for testing.

#### Timer reservation



The timer reservation function can be used to start/stop the system on a schedule. Testing can be reserved to suit usage conditions, such as setting the testing end time to coincide with business hours or the next test.



Displays trend graphs showing temperature measurements for the testing chamber. The display can be scrolled and reset.

#### Note function



This function allows the LCD control panel to be used as a notepad. Text, lines, sketches, and more can be written directly on the LCD control panel by finger or touch pen. Up to eight screens can be registered.

#### Cycle counter

771	(クルカウンター		Rő
子熱 1: 試験室	33 t 77 - 56 t <b>25</b> c	試験サイクル数 0 残り時間 0	/ 50 9.4%
	カウンター	中断サイクル数	
No. 1	•	0	
No. 2	0	0	
No. 3	0	· · ·	
No. 4	0	0	
No. 5	0	۰ ۱	
12:34 901 905	·····································	特殊	

Five cycle counters can be set.

This allows the cycle counter to be displayed, or testing to be suspended, after a certain number of cycles.

#### Operation mode and reduced power operation settings



#### **Operation mode setting** Sets the system performance during the testing cycle.

#### Reduced power operation setting

Reduced power operation avoids excessive preheating and precooling.

Energy saving	Reduced the system performance. Select this when there are few samples, or when the low-temperature testing temperature is high.	Reduced power operation 1	During the final testing cycle, the system stops precooling the low-temperature chamber once low-temperature testing has ended, and stops preheating the high-temperature chamber once high-temperature testing has ended. Note: This will be disabled if the operation control end position is stop after drying or stop after preparing.
Standard	Standard system performance.		During precooling, the system stops the operation of the refrigerator from the point when the precooling temperature is reached until a certain time prior to starting low-temperature testing. During preheating the
High load	Increased the system performance. Select this when there are many samples, or when the low-temperature testing temperature is low.	operation 2	system stops the operation of the heater from the point when the preheating temperature is reached until a certain time prior to starting high-temperature testing. Note: If reduced power operation 2 is set, the temperature return time may decrease depending on operation conditions. Perform preliminary testing to confirm performance and specifications before using this.

#### Standard-equipped with a range of functions for enhanced ease of use and reduced power consumption

Function	Contents
End condition setting	Allows the selection of end conditions after the temperature cycle operation has ended. ·Stop after drying operation ·Stop after room temperature operation ·Stop after defrosting operation ·Preparation operational status
Operation mode setting	Allows the operation mode to be set based on testing. •Energy saving •Standard •High load
Trend graph	Displays trend graphs (with scrolling).
Test pattern name input	Allows names to be registered to test patterns (up to 10 alphanumeric characters).
Timer	•Allows operation to start/stop on a timer in one of three modes (once, daily, or day of the week).
Cycle suspension	Allows an operation to be suspended after the specified number of cycles.
Notepad	Allows notes (text, sketches, etc.) to be written on the LCD panel.

#### 

Item	Specification	
Temperature recorder	Select either paperless or a paper chart (100 mm width; 1 pen, 6 dots).	
Emergency stop switch	Shuts power down via the earth leakage circuit breaker.	
Communication interface	Select either RS-485 or web interface (including Ethernet).	
Communication interface cable	RS-232C: 4 m, 10 m	
Cable hole	$\phi$ 50 mm $ imes$ 1, added next to standard cable hole (left side surface)	
Sensor switching function	Select either upwind side or downwind side for the testing chamber temperature control point (can be switched).	
Internal air compressor	Air compressor output 0.2 kW	
Power supply terminal block	Three-phase 200V 0.2 kW or 0.4 kW (0.2 kW only for ES-57L)	
for air compressor connection		
Cycle counter	Eight digits, with or without reset function	
Signal indicator	Three colors (Green: Operating, Yellow: Power supply, Red: Error)	
Sample temperature monitor system	Begins testing time count based on the measured surface temperature of the sample.	
Increased sample shelf permission weight	Permissible sample weight: 20 kg per shelf (ES-57/107)	
Sample basket	Permissible sample weight: 4 kg per shelf (ES-57/107)	
Water-cooling specification	Replaces standard cooling with water-cooling	
Liquefied pitrogen gas injector	With injection pipe, solenoid valve, fittings, and control switch	
Liquened hitrogen gas injector	(Liquefied nitrogen not included)	

\*We offer a wide range of options to suit various needs. (Refer to P33 through P36.)

#### Specification table =

	Cat	egory		Basic	Туре			
lt	em	N	Nodel	ES-57L	ES-107L			
	Туре	5	-	Stationary sample type, cool/hot air switchable, two/three zone switchable				
	Temperature range	Low-temperature testing	Ĉ	-70	to 0			
	(testing chamber)*2	High-temperature testing	Ĉ	60 to 200 *3				
	Tempe fluctuatio	rature n margin	Ĉ	±	0.5			
Pe	Temperatur (high-temperat	e rise time ture chamber)	-	Room temperature to	200°C: Within 15 min.			
rforn	Temperature (low-temperat	e drop time ure chamber)	-	Room temperature to $-75^{\circ}$ C: Within 75 min.	Room temperature to $-75^{\circ}$ C: Within 70 min.			
nar	Ter Cy	rcles	—	5 cycles (low-te	mperature start)			
lCe	Per Sample	Туре	-	Plastic m	nolded IC			
	at Sample	Weight	-	3.5 kg (IC 2.5 kg + jig 1.0 kg)	5 kg (IC 3.5 kg + jig 1.5 kg)			
	Testing chamber	Low temperature	-	−55℃/	30 min.			
	temperature	Room temperature	-	Atmosphere ten	nperature/5 min.			
	을 / Testing time	High temperature	-	150°C/.	30 min.			
	Temperature me	asurement position	-	Upwind side				
	a Temperature	e return time	-	Within 5 min.				
	Cooling m	ethod	-	Air-cooling (internal)				
	Exteri	or	-	Stainless steel plate (SUS430, hairline finish)				
Testing chamber volume			L	47	105			
-		Width	mm	275	470			
le	sting chamber	Depth	mm	375	485			
	unitensions	Height	mm	460				
	Decident.	Width	mm	1,140	1,380			
	Product	Depth	mm	1,050	1,270			
		Height	mm	1,9	980			
	Permissible san inside testing	nple weight chamber	kg	30	50			
D.		High-temperature side	-	R40	)4A			
ке	ingerant type	Low-temperature side	-	R508A	R23			
	Operationa	al noise	dB(A)	6	5			
	Safeguards -			Earth leakage circuit breaker, electric motor overload safeguar operation with door open prevention switch, excess temp	Earth leakage circuit breaker, electric motor overload safeguard, electrical fuse, high-voltage shutdown system for refrigerator, operation with door open prevention switch, excess temperature increase prevention system, and temperature fuse			
	Accesso	ories	-	Cable hole soft silicon plug $\times$ 1, sample shelf $\times$ 2, shelf support $\times$	4, operation circuit protection fuse $\times$ 2, and instruction manual $\times$ 1			
-		Pressure	MPa	0.4 t	o 0.7			
D	ry air	Consumption	L(ANR)	Approx. 7.	6 per cycle			
	Power su	upply		Three-phase 200V 50/60Hz, Three-pha	se 220V 60Hz, Three-phase 380V 50Hz			
Ma	aximum load current / P	ower supply capacity	A/kVA	43 / 15	60 / 21			
	Product v	veight	kg	550	800			

Notes:

\*1: Performance based on following conditions.

Ĩ	Model	ES-57L•ES-107L	
Temperature rise/drop time	Ambient temperature	Ĉ	20
Temperature return time	Ambient temperature	°C	10~30
Operable range	Ambient temperature	Ĉ	0~40

\*2: Can be operated in an ambient temperature from 0 to  $40^\circ$ C and with a power supply voltage within ±10% rated voltage.

2. Can be operated in an ambient temperature form 0.040°C and which a power supply voltage within 1.10% rated voltage.
Note that this is with the ambient temperature measured near the upper rear surface of the system (near the air-cooling condenser air suction inlet).
\*3: A high-temperature testing temperature of 80°C or lower is possible only at an ambient temperature of 20°C or lower.
\*4: The maximum load current is the value at a specified rated power supply voltage and an ambient temperature of 20°C.
\*5: The temperature return time is the point in time where the temperature reaches ±2°C of the set high temperature or low temperature.

#### Dimensions







Model	а	b
ES-57L	1,140	1,050
ES-107L	1,380	1,270

(Unit: mm)

# High Performance Type Air flow Type

# High Performance Type with inverter control

Inverter control provides enhanced energy saving performance. The system is also easier to use, including 100-cycle continuous operation and a larger LCD screen.

Lineup							
	-	Cooling	Testing chamber volume (L)				
	Туре	method	74	105	200	305	
	High Performance	Water-cooling	ES-77LH	ES-107LH	ES-207LH	ES-307LH	



Photo for illustrative purposes only. (Includes optional specification [temperature recorder])

100-cycle continuous operation provided as a standard

Capable of operating for 100 continuous

high-temperature testing). Continuous

operation can reduce testing times.

Two-zone testing, low-temperature start, reduced power operation 2 function disabled

-40°C/30 min. (precool -60°C), ES-77LH: 6.5 kg, ES-107LH:

7.5 kg, ES-207LH: 30 kg, ES-307LH: 21 kg

Includes weight of plastic molded IC and sample loading jig. (All models)

cycles with no defrosting during two-zone operation (cycles between

low-temperature testing and

Testing conditions

(control point upwind)

Sample:

High-temperature testing: 125℃/30 min. (preheat 145℃)

Low-temperature testing:

Ambient temperature: 20°C

of the rated voltage

Ambient humidity: 50% or lower

Coolant inlet temperature: 25°C

Power supply voltage: Within ±5%

\*100-cycle continuous operation may not be possible under other testing conditions.

#### Reduced power consumption (in energy saving mode)

Inverter control is used for the compressors on the high-temperature side and low-temperature side of the dual refrigeration cycle, for reduced power consumption compared with previous models.



#### **Testing conditions**

Two-zone testing, low-temperature start, energy saving mode, energy saving 2 enabled. (Control point: Upwind control) High-temperature testing: 125°C/30 min. (preheat 145°C)

Low-temperature testing: -40°C/30 min. (precool -60°C)

Sample: 21 kg (includes weight of plastic molded IC and sample loading jig) Ambient temperature:  $20^{\circ}C$ 

Coolant inlet temperature: 25°C

Power supply voltage: Within  $\pm 5\%$  rated voltage.

\*Energy saving mode performs inverter control of the compressor when testing samples of low heat capacity to maintain an appropriate level of cooling performance and when controlling the output of the heater used to maintain temperature, resulting in lower power consumption during operation.

#### High Performance Type (differences from Basic Type)

The temperature condition during low-temperature testing is -65°C (compared to -55°C for Basic Type).
 The temperature drop time from room temperature to -75°C (low-temperature chamber) is within 50 min. (compared to within 45 min. for ES-207LH/307LH, within 75 min. for Basic Type) \*Under the testing conditions listed in the specification table.

#### Larger LCD screen

The screen has been increased from 8.4 inches to 10.4 inches (vertical orientation).

8.4-inch display (horizontal orientation)

#### High Performance 10.4-inch display (vertical orientation)





#### Testing time set by the second

High/room/low-temperature testing times can be set by the second. This allows for a finer range of testing conditions.



#### Data log function

If the system stops with an alarm due to an error being detected, this function saves the operational status of the system immediately prior to stopping, to a USB storage device. This data can be helpful for diagnosis and analysis.



#### Language switching function

The language used for the LCD control panel can be changed on the control panel. Four languages are supported (Japanese, English, Chinese [simplified], and Korean).



#### Scrolling

Trend graphs and screens displaying a scroll bar can be scrolled to view a wider range of information and show areas hidden by the screen.



**High Performance** 

Type

#### Individually set room temperature testing times

The room temperature testing time after high-temperature testing can be set separately from the room temperature testing time after low-temperature testing. This allows for the use of testing conditions where the room temperature testing time differs after high-temperature testing and low-temperature testing.





#### Swiping

The display can be switched between three screens (measurement screen, trend graph screen, and pattern settings screen) by swiping the swipe area on the top of the screen to the right or left.



#### Specification table

	C	atego	ory			High Perfor	mance Type				
	ltem		N	lodel	ES-77LH	ES-107LH	ES-207LH	ES-307LH			
	Ty	ре		—	Stationary	/ sample type, cool/hot air s	witchable, two/three zone s	witchable			
	Temperature	Testing	g temperature	—	Low-tempe	rature testing: $-70$ to $0^{\circ}$ ,	High-temperature testing: 60	to 200℃ *2			
	setting range	Precool	ing temperature	—	- 8	0°C to testing chamber temp	perature low-temperature set	ting			
		Preheat	ing temperature		Testing chamber temperature high-temperature setting to 210°C						
	Temperature f	luctuat	ion margin	Č		±	0.5				
	l emperat (high-temperat	ture rise ature cl	e time hamber) *3	_		Room temperature to	200°C : Within 20 min.				
-	Temperat (low-tempera	ure dro <u>ture ch</u>	p time lamber) *3	—	Room temperature to -	– 75℃ : Within 50 min.	Room temperature to	– 75℃ : Within 45 min.			
en	Temperati	ure retu	urn time *5	—	Within	5 min.	Within	10 min.			
Q	Return time	guaran	teed cycles	—		<u> </u>	mperature start)				
B	a Sam	ole -	Туре			Plastic m	nolded IC				
DUE			Weight		6.5 kg (IC 4.5 kg + dual-stage jig 2.0 kg)	7.5 kg (IC 5.0 kg + dual-stage jig 2.5 kg)	30 kg (IC 21 kg + dual-stage jig 9.0 kg)	21 kg (IC 12 kg + dual-stage jig 9.0 kg)			
'n	cycle Testi	ng	Low temperature	_		– 65°C /	/30 min.				
	perfo cham temper	ber ature	Room temperature	_	Atmosphere terr	nperature/5 min.	Atmosphere tem	perature/10 min.			
	Ormar ditio	g time	High temperature	—		150℃ /	′30 min.				
	Real Remper	ature m positio	easurement	_		Upwir	nd side				
	Continuous o	peratio	n cycles*6	—		100 cycles (low-t	emperature start)				
	Testing char	nber v	volume	L	74	200	305				
Permissible sample weight inside testing chamber		weight mber	_	Max. 30 kg (Bottom 20 kg or less, sample shelf 5 kg or less [per shelf])	Max. 50 kg (Bottom 40 kg or less, sample shelf 5 kg or less [per shelf])	Max. 50 kg (Bottom 40 kg or less, sample shelf 12 kg or less [per shelf])	Max. 50 kg (Bottom 40 kg or less, sample shelf 12 kg or less [per shelf])				
Т	octing cham	bor	Width	mm	410	470	630	720			
l '	dimension	s	Depth	mm	390	485	690	920			
		-	Height	mm	460	460	460	460			
	Product	Ļ	Width	mm	1,380	1,380	1,535	1,625			
	dimension	s –	Depth	mm	1,400	1,400	1,450	1,670			
			Height	mm		1,980					
S	ystem compor	nent	Exterior		Stainless steel plate (SUS430, natrune finish)						
	- materials		Interior		Dual refrigeration using mechanical compressor (under cooling)						
	Cooling	meth	OO		Dua	at retrigeration using mechan	ical compressor (water-cool	ing)			
	Cooling syste	temper ig system sid		—	R404A/4.5 kW (	inverter control)	R404A/7.4 kW (	R404A/7.4 kW (inverter control)			
	refrigerant/out	put	Low- temperature side	_	R23/3.7 kW (ir	overter control)	R23/4.5 kW (inverter control)				
	Safeg	uards		_	Earth leakage circuit breake operation with door open p	r, electric motor overload saf revention switch, excess tem	eguard, high-voltage shutdow perature increase prevention	n system, temperature fuse, system, and protection fuse			
	Operatio	onal n	oise *9	dB(A)		6	5				
Accessories –				—	Cable hole soft silicon plu coolant piping	$g \times 1$ , sample shelf $\times 2$ , sh Y strainer (teethed and plug	elf support $\times$ 4, operation ci gged) $\times$ 2 sets, and instruction	rcuit protection fuse $\times$ 2, on manual $\times$ 1			
Power supply *8.1			ly *8.1	—	Three-phas	e 200V 50/60Hz, Three-pha	se 220V 60Hz, Three-phase	380V 50Hz			
	Maximum l / Power sup	oad cu ply ca	urrent *7 pacity	A/kVA	78 /	× 27	120	/ 42			
	Dry air	Pr	ressure	MPa		0.4 t	0 0.7				
	*8.2	Con	sumption	L(ANR)		Approx. 10	.2 per cycle				
		Wat	er volume	L/h	2,750 (coolant inlet	temperature 32°C)	4,200 (coolant inlet	temperature 32°C)			
	Coolant	Wate	er pressure	MPa		0.1 t	o 0.5				
	*8.3	Syster	n side piping liameter	_		Rc1	1 / 4				
	Drain	piping	*8.4	—		Rc 1	/ 2				
	Product weight		nt	kσ	QE	50	1 100	1 250			

Notes

- \*1. Can be operated in an ambient temperature from 0 to 40°C, a coolant inlet temperature from 5 to 38℃, and a power supply voltage within ±10% rated voltage.
- voltage.
  \*2. A high-temperature testing temperature of 80°C or lower is possible only at an ambient temperature of 20°C or lower.
  \*3. The temperature rise time and drop time are at an ambient temperature of 20°C and a coolant inlet temperature of 25°C.
  \*4. Values given for temperature cycle performance are given under the following conditions:
- 4. Values given for temperature cycle performance are given under the following conditions:
  (1) Ambient temperature from 10 to 30°C, ambient humidity from 30 to 60%, and coolant inlet temperature from 15 to 30°C
  (2) Power supply voltage within ±5% rated voltage.
  \*5. The temperature return time is the point in time where the temperature reaches ±2°C of the set high temperature or low temperature after zone switching.
- switching. \*6. 100-cycle continuous operation is under the following conditions. Note that

- \*\*6. 100-cycle continuous operation is under the following conditions. Note that three-zone testing is not supported.
  (1) Ambient temperature of 20°C, ambient humidity of 50% or lower, and coolant inlet temperature of 25°C
  (2) Power supply voltage within ±5% rated voltage
  (3) Testing conditions: Low-temperature start with cycling between high-temperature testing at 125°C (30 min.) with preheat of 145°C and low-temperature testing at -40°C (30 min.) with precool of -60°C, two-zone testing, with sample (listed per model in the standard specification table; includes weight of plastic molded IC and sample loading jig)
  (4) No testing cycle suspension and no testing chamber door opening/closing
  \*7. The maximum load current is the value at an ambient temperature of 20°C, coolant inlet temperature of 25°C, and the specified power supply voltage.
  \*8. The following must be provided separately.
  \*8.1. Power supply: Power supply wiring and ground wire are not included. These will need to be prepared and connected separately.
  \*8.2. Dry air: Dry air will need to be supplied for damper operation. (There is a compressed air unit [pressure gauge and pressure reducing valve] built into the system.)

- built into the system.) \*8.3. Coolant: The included Y strainers will need to be connected to the coolant
- inlet piping for the coolant condenser to supply coolant through the Y strainers.

- \*8.3 Coolant piping connection diagram
- System Rear surface side Coolant outlet

Part	Name	Note(s)	Part	Name	Note(s)
1	Connection joint	Equipment	$\bigcirc$	Teeth	Prepared separately
2	Stainless steel piping	Prepared separately	8	Strainer outlet stop valve	Prepared separately
3	Vent plug (also for rinse port)	Accessory	9	Strainer	Accessory
(4)	Union joint	Prepared separately	10	Strainer inlet stop valve	Prepared separately
5	Coolant outlet stop valve	Prepared separately	11	Coolant inlet stop valve	Prepared separately
6	Drain plug (also for rinse port)	Accessory	12	Bypass stop valve	Prepared separately

There are two Y strainers included, and they must be connected in parallel. The strainers will need to be maintained while the system is running.
A coolant inlet piping diagram is shown to the right.
The coolant quality conforms to the JRAIA water quality standards.
\*8.4. Drain piping: This is used for draining water.
\*9. The value given for operational noise is at a location 1 m from the product front surface and 1 m above the floor, within an anechoic chamber or other location with little acho.

- location with little echo

Actual values may vary depending on actual installation conditions and ambient echoes

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#### Dimensions

#### ES-77LH•ES-107LH





ES-207LH·ES-307LH



 $\overline{\mathbf{\cdot}}$ ŀ **\***\* IC IC JI

b

Model	а	b
ES-207LH	1,535	1,450
ES-307LH	1,625	1,670

\*Maintain the following conditions in the system installation area.

(1) Waste heat handling Waste heat (approx. 2.3 kW) will be generated around the system

during operation. This can cause the room temperature to rise (especially in narrow areas) and hot air to stagnate around the system. Waste heat must be handled appropriately, through means such as ventilation and air conditioned

(2) Installation space
 The system requires space for waste heat exhaust, air intake, maintenance, and inspection. Refer to the figure on the right, and ensure sufficient space from nearby walls and devices.



#### Options

Item	Specification
Temperature recorder	Select either paperless or a paper chart (100 mm width; 1 pen, 6 dots).
Emergency stop switch	Shuts power down via the earth leakage circuit breaker.
Internal air compressor	Air compressor output 0.2 kW
Cable hole	$\phi$ 50 mm $ imes$ 1, added next to standard cable hole (left side surface)
Sample basket	Permissible sample weight: 4 kg per shelf (ES-77LH/107LH), 8 kg per shelf (ES-207LH/307LH)
Cycle counter	Eight digits, with or without reset function
Signal indicator	Three colors (Green: Operating, Yellow: Power supply, Red: Error)
Power supply terminal block for air compressor connection	For three-phase 200V 0.2 kW or 0.4 kW
Sensor switching function	Select either upwind side or downwind side for the testing chamber temperature control point (can be switched).
Sample temperature monitor system	Begins testing time count based on the measured surface temperature of the sample.
Communication interface	Select either RS-485 or web interface (including Ethernet).
Communication interface cable	RS-232C: 4 m, 10 m

\*We offer a wide range of options to suit various needs. (Refer to P33 through P36.)

Air flow Type

# High Performance / Air-Cooling Remote Condenser Type

#### Conceptual connection diagrams



#### Lineup

	Tyne	Cooling		Testing cham	per volume (L)	
1,pc		method	74	105	200	305
	High Performance / Air-Cooling Remote Condenser	Air-cooling	ES-77LH-R	ES-107LH-R	ES-207LH-R	ES-307LH-R

#### No waste heat handling required

The remote air-cooling condenser can be installed outside. Waste heat from the condenser is expelled outside so there is no need to install fans.

#### There is no need to install a coolant source.

The Air-Cooling Remote Condenser Type requires none of the coolant source installation or maintenance that would be required for a water-cooling specification system.

#### Example water-cooling system



#### The condenser is powered from the testing apparatus.

The air-cooling remote condenser can be powered by connecting it to a power supply terminal block installed on the testing apparatus. There is no need to install a dedicated power supply for the condenser.

#### Specification table

Category						F	ligh Performance / Air-Cool	ing Remote Condenser Type	e
I	tem	,		N	lodel	ES-77LH-R	ES-107LH-R	ES-207LH-R	ES-307LH-R
		Тур	be		_	Stationary	sample type, cool/hot air s	witchable, two/three zone s	witchable
	Tom	Te	esting	temperature	—	Low-temp	rature testing: $-70$ to 0°C, High-temperature testing: 60 to 200°C <sup>*2</sup>		
	settir	ng range	Precooling temperature			-80	)°C to testing chamber temp	erature low-temperature set	tting
	Preheating temperature					Test	ing chamber temperature hi	igh-temperature setting to 2	<u>10℃</u>
	Ten	nperatu ma	re flu argin	ictuation	°C		±(	0.5	
	(high	Temperat n-tempera	ure ris iture c	e time hamber)*3	_		Room temperature to	200℃: Within 20 min.	
Pe	T (low)	Temperati. /-tempera	ure dro ture c	op time hamber)*3	_	Room temperature to	–75℃: Within 50 min.	Room temperature to	–75℃: Within 45 min.
rfo		Temperat	ure re	turn time <sup>*5</sup>	-	Within	5 min.	Within	10 min.
rma		Return time	guaran	teed cycles	-		5 cycles (low-te	mperature start)	
DUE	empe	Samp	ole	Туре			Plastic m	nolded IC	
Ð	eratu	<u>_</u>	-	Weight	-	6.5 kg (IC 4.5 kg + dual-stage jig 2.0 kg)	7.5 kg (IC 5.0 kg + dual-stage jig 2.5 kg)	30 kg (IC 21 kg + dual-stage jig 9.0 kg)	21 kg (IC 12 kg + dual-stage jig 9.0 kg)
	e cycle p	fing Testing chi	amber	temperature	_		−65°C/	30 min.	
	berforma	tempera	ature g time	Room temperature	_	Atmosphere ten	nperature/5 min.	Atmosphere terr	nperature/10 min.
	nce *4			High temperature	_		150℃/.	30 min.	
		Temperatur	re measu	rement position	_		Upwir	nd side	
	Cont	tinuous op	peratio	on cycles*6			100 cycles (low-t	emperature start)	1
Т	estir	ng cham	ber	volume	L	74	105	200	305
F	Perm insi	issible sa ide testin	ample Ig cha	weight mber	_	Max. 30 kg (Bottom 20 kg or less, sample shelf 5 kg or less [per shelf])	Max. 50 kg (Bottom 40 kg or less, sample shelf 5 kg or less [per shelf])	Max. 50 kg (Bottom 40 kg or less, sample shelf 12 kg or less [per shelf])	Max. 50 kg (Bottom 40 kg or less, sample shelf 12 kg or less [per shelf])
Т	estir	ing chamber		Width	mm	410	470	630	720
	dir	mension	S	Depth	mm	390	485	690	920
				Height	mm	460	460	460	460
				Width	mm	1,380	1,380	1,535	1,625
P	roauc	ct aimensi	ions	Depth	mm	1,400	1,400	1,450	1,670
				Height	mm		I,S	180 CLIC 420, bairling finish)	
Sy	stem co	omponent mai	terials	Exterior	-		Stainless steel plate (	SUS430, nairline finish)	
			moth	Interior				SUSSU4, 2B polisited)	
			meu	High-			All-Cooling Remot		
C re	Coolir frige	ng syster rant/out	m <sup>t</sup>	emperature side	_	R404A/4.5 kW (	inverter control)	R404A/7.4 kW (inverter control)	
		*8.3	t	emperature side	_	R23/3.7 kW (ir	nverter control)	R23/4.5 kW (inverter control)	
		Safegu	uard	s	_	Earth leakage circuit breaker, electric motor overload safeguard, high-voltage shutdown system, tempe operation with door open prevention switch, excess temperature increase prevention system, and pro			
	Op	peration	nal n	ioise *9	dB(A)		6	5	
		Access	sorie	2S	_	Cable hole soft silicon plu inst	$x = 1$ , sample shelf $\times 2$ , shere $x = 1$ , and air $x = 1$ , and air $x = 1$ , and $x = 1$ .	elf support × 4, operation c -cooling remote condenser	ircuit protection fuse $\times$ 2, $\times$ 1
		Power s	supp	oly *8.1	-	Three-phas	e 200V 50/60Hz, Three-pha	se 220V 60Hz, Three-phase	380V 50Hz
Max	cimum la	oad current*7	/ Power	supply capacity	A/kVA	83 /	/ 28	125	/ 43
	Dry	/air	Pre	essure	MPa		0.4 t	0.7	
	*8	.2	Cons	umption	L(ANR)		Approx. 10	.2 per cycle	
		Drain p	pipin	lg *8.5	-		Rc 1	/2	1.050
	+	Product	weig	ght	kg	95		1,100	1,250
0	ompa	atible air-co		condenser	_	RCR	-R65	RCR-	RIUF
	On	testing	appa	ing: ratus <sup>*8.4</sup>	_	Refrigerant gas outlet: $\phi$ 15.88 Refrigerant liquid inlet: $\phi$ 12.7	copper pipe flare connection	Refrigerant gas outlet: $\phi$ 19.05 Refrigerant liquid inlet: $\phi$ 15.88	copper pipe flare connection 3 copper pipe flare connection
	R On	efrigeran remote	nt pip cond	ing: enser <sup>*8.4</sup>	_	Refrigerant gas inlet: $\phi$ 15.88 c Refrigerant liquid outlet: $\phi$ 12.7	opper pipe brazed connection copper pipe brazed connection	Refrigerant gas inlet: $\phi$ 19.05 c Refrigerant liquid outlet: $\phi$ 15.88	opper pipe brazed connection copper pipe brazed connection
C	Air	-cooling denser v	g rer wast	note e heat	kW	Max.	19.0	Max.	33.5
Remote condenser weight			r weight	kg	6	5	13	35	

\*1. Can be operated in an ambient temperature (testing apparatus and air-cooling remote condenser) from 0 to 40°C and with a power supply voltage within ±10% rated voltage.

\*2. A high-temperature testing temperature of 80°C or lower is possible only at an ambient temperature of 20°C or lower.
\*3. The temperature of 20°C or lower.
\*3. The temperature rise time and drop time are at an ambient temperature (testing apparatus and air-cooling remote condenser) of 20°C.
\*4. Temperature cycle performance values are given under these conditions: (1) Ambient temperature (testing apparatus and air-cooling remote condenser) from

(1) Ambient temperature (testing apparatus and remote condenser) from 10°C to 30°C, and ambient humidity (testing apparatus) from 30 to 60% (2) Power supply voltage within ±5% rated voltage.
\*5. The temperature return time is the point in time where the temperature reaches ±2°C of the set high temperature or low temperature after zone switching.

switching.

\*6.

switching.
100-cycle continuous operation is under the following conditions.
Note that three-zone testing is not supported.
(1) Ambient temperature (testing apparatus and air-cooling remote condenser) 20°C, and ambient humidity (testing apparatus) 50% or lower
(2) Power supply voltage within ±5% rated voltage
(3) Testing conditions: Low-temperature start with cycling between birds temperature testing at 12°C (30 min.) with preheat of 145°C and

(3) results conditions. Low-temperature start with cycling between high-temperature testing at 125°C (30 min.) with preheat of 145°C and low-temperature testing at -40°C (30 min.) with precool of -60°C, two-zone testing, with sample (listed per model in the standard specification table; includes weight of plastic molded IC and sample loading jig)

(4) No testing cycle suspension and no testing chamber door opening/closing 7. The maximum load current is the value at an ambient temperature (testing apparatus and air-cooling remote condenser) of 20°C and the specified power supply voltage. This includes the current from the air-cooling remote condenser.

- \*8. The following must be provided separately.
  \*8.1. Power supply: Power supply wiring and ground wire are not included. These will need to be prepared and connected separately.
  \*8.2. Dry air: Dry air will need to be supplied for damper operation. (There is a compressed air unit [pressure gauge and pressure reducing valve] built into the curtan.)
- \*8.3. Refrigerant piping: This is for connecting the testing apparatus and approximate and the set of the testing apparatus is shipped filled with inert gas, which must be removed (vacuumed) before filling with refrigerant.
  It is filled with "R23" refrigerant for the low-temperature side cycle.
  \*8.4. Refrigerant piping: This is for connecting the testing apparatus and air configure apparatus apparatus

- air-cooling remote condenser.
  Piping must be prepared separately.
  \*8.5. Drain piping: This is used for draining water.
  \*9. The value given for operational noise is at a location 1 m from the product front surface and 1 m above the floor, within an anechoic chamber or other location with little echo. Actual values may vary depending on actual installation conditions and

ambient echoes.

High Performance Air-Cooling Remote Condenser Type

#### Dimensions •

#### ES-77LH-R•ES-107LH-R





(Unit: mm)

Air-Cooling Remote Condenser RCR-R6S



#### ES-207LH-R•ES-307LH-R





Air-Cooling Remote Condenser RCR-R10F



1,645

Model	а	b
ES-207LH-R	1,535	1,450
ES-307LH-R	1,625	1,670

### Options =

ltem	Specification
Temperature recorder	Select either paperless or a paper chart (100 mm width; 1 pen, 6 dots).
Emergency stop switch	Shuts power down via the earth leakage circuit breaker.
Communication interface	Select either RS-485 or web interface (including Ethernet).
Communication interface cable	RS-232C: 4 m, 10 m
Cable hole	ø50 mm $ imes$ 1, added to standard cable hole (left side surface) area
Sensor switching function	Select either upwind side or downwind side for the testing chamber temperature control point (can be switched).
Internal air compressor	Air compressor output 0.2 kW
Power supply terminal block for air compressor connection	For three-phase 200V 0.2 kW or 0.4 kW
Cycle counter	Eight digits, with or without reset function
Signal indicator	Three colors (Green: Operating, Yellow: Power supply, Red: Error)
Sample temperature monitor system	Begins testing time count based on the measured surface temperature of the sample.

\*We offer a wide range of options to suit various needs. (Refer to P33 through P36.)

#### **Cosmopia STANDARD SERIES**

# Air flow Type High Performance / High Speed T

### Compliant with IEC testing standard temperature return times.

Capable of temperature return times stipulated for "Test Na" in IEC 60068-2-14 (Edition 6.0) (temperate change testing standard).

Lineup					
Turne	Cooling	Testing chamber volume (L)			
Туре	method	105	200		
High Performance / High Speed	Water- cooling	ES-107LHH	ES-207LHH		



Photo for illustrative purposes only. (Includes optional specification [temperature recorder])

#### Compliant with IEC testing standards

#### Testing conditions (standard performance)

Temperature return time of within 3 min. for air temperature on the upwind side of testing chamber, cycling between −55°C for 30 min. and 125° C for 30 min.

#### Sample conditions (standard performance)

Plastic molded IC 5 kg (ES-107LHH), 10 kg (ES-207LHH), including loading jig weight.

(Testing conditions other than standard conditions may not meet these testing standards.)



#### Temperature return time of within 3 min.

This High Speed Type Thermal Shock testing apparatus offers increased heat storage performance for a temperature return time of within 3 min.

#### <ES-107LHH testing conditions>

Testing operation	Testing temperature	Testing time				
Low-temperature testing	−55℃	30 min.				
High-temperature testing	125℃ 30 min.					
Sample weight	IC + Shelf support + Sample basket = 5 kg					
Cycles	5 cycles (low-temperature start)					
Upwind control	Two-zone test					



#### Specification table

Category					High Performance	/ High Speed Type		
Item			N	lodel	ES-107LHH	ES-207LHH		
Туре				—	Stationary sample type, cool/hot air s	witchable, two/three zone switchable		
Tempera	ature Testi	ng tem	perature	—	Low-temperature testing: -70 to 0°C , High-temperature testing: 60 to 200°C			
setting Precooling temperature					$-80^\circ$ C to testing chamber temperature low-temperature setting			
range	e Prehe	ating ten	nperature	—	Testing chamber temperature h	igh-temperature setting to 210℃		
Temp	erature flu	ctuatior	margin	Ĉ	±(	0.5		
Temperatu	ire rise time (hig	h-temperati	ire chamber)*3	-	Room temperature to	150°C : Within 20 min.		
Temperatu	ire drop time (lo	w-temperati	ure chamber)"	-	Room temperature to $-75^{\circ}$ : Within 50 min.	Room temperature to $-75^{\circ}$ : Within 45 min.		
for le	mperatur	e returr	n time s	-	VVithin E a alas (la ala	3 min.		
	turn time gl	Jarantee	a cycles	-	5 CYCles (IOW-te	mperature start)		
Test nce	Sample		ype oight	-	FldSUC II	10 kg (IC E E kg + single stage iig 4 E kg)		
e yde		VV	eigni	_	5 Kg (IC 2.5 Kg + Single-Slage Jig 2.5 Kg)	10  kg (IC 5.5 kg + Single-Slage Jig 4.5 kg)		
perfor t	esting champer	Poom t	amperature	_	- 550/	50 mm.		
orma	Testing time	High te	mnerature	_				
	emperature n		nt position	_		ad side		
Conti		eration	cvcles <sup>*6</sup>	_	100 cycles (low-t	emperature start)		
Test	ing cham	ber volu	ume	L	105	200		
Permissi	ble sampl	e weig	nt inside		Max. 30 kg	Max, 50 kg		
	testing ch	amber		-	(Bottom 20 kg or less, sample shelf 5 kg or less [per shelf])	(Bottom 40 kg or less, sample shelf 12 kg or less [per shelf])		
Teel	in er ole e vel		Width	mm	470	630		
l est	imensions	ber	Depth	mm	485	690		
u			Height	mm	460			
	Product		Width	mm	1,380	1,535		
d	imensions	5	Depth	mm	1,400	1,450		
			Height	mm	1,9	980		
Syste	m compo	nent	Exterior	-	Stainless steel plate (SUS430, hairline finish)			
	materials		Interior	-	Stainless steel plate (SUS304, 2B polished)			
Carling		nethod	atura cida	-	Dual refrigeration using mechanical compressor (water-cooling)			
COOLING Sy	outout Lov	-temper	ature side	_	R404/4.5 KVV (Inverter control)	R404/7.4 KVV (INVERTER CONTROL)		
Temperant	output LOW	/-tempera	ature side	_	R23/3.7 KVV (INVERTER CONTROL)	R23/4.5 KVV (INVERTER CONTROL)		
	Safegu	ards		-	operation with door open prevention switch excess tem	perature increase prevention system, and protection fuse		
	perationa	al noise	*9	dB(A)	6	5		
	Access				Cable hole soft silicon plug $\times$ 1, sample shelf $\times$ 2, sh	elf support $\times$ 4, operation circuit protection fuse $\times$ 2,		
	ACCESS	JIIES			coolant piping Y strainer (teethed and plug	gged) $\times$ 2 sets, and instruction manual $\times$ 1		
	Power su	pply <sup>*8.1</sup>			Three-phase 200V 50/60Hz, Three-pha	se 220V 60Hz, Three-phase 380V 50Hz		
Max Pov	imum loa ver suppl <sup>,</sup>	d curre y capac	nt*7/ city	A/kVA	78 / 27	120 ⁄ 42		
Dry air Pressure		MPa	0.4 t	o 0.7				
*8.2	Со	nsumpt	ion	L(ANR)	Approx. 10	.2 per cycle		
<u> </u>	Wa	ter volı	ume	L/h	2,750 (coolant inlet temperature $32^{\circ}$ )	4,200 L (coolant inlet temperature $32^{\circ}$ C )		
Coolant *8.3	Wat	er pres	sure	MPa	0.1 t	o 0.5		
	System si	de piping	diameter	-	Rc1	1/4		
	Drain pip	bing*8.4		-	Rc 1	/ 2		
Product weight				kg	960	1,120		

- \*1. Can be operated in an ambient temperature from 0 to 40°C, a coolant inlet temperature from 5 to 38°C, and a power supply voltage within  $\pm$ 10% rated voltage.
- \*2. A high-temperature testing temperature of 80°C or lower is possible only at an ambient temperature of 20°C or lower.
- \*3. The temperature rise time and drop time are at an ambient temperature of 20°C and a coolant inlet temperature of 25°C.
- \*4. Temperature cycle performance values are given under these conditions:
  (1) Ambient temperature from 10°C to 30°C, ambient humidity from 30 to 60%, and coolant inlet temperature from 15°C to 30°C
  (2) Power supply voltage within ±5% rated voltage.
- \*5. The temperature return time is the point in time where the temperature reaches ±2°C of the set high temperature or low temperature after zone switching.
- \*6. 100-cycle continuous operation is under the following conditions. Note that three-zone testing is not supported.
  - (1) Ambient temperature of 20°C, ambient humidity of 50% or lower, and coolant inlet temperature of 25°C
  - (2) Power supply voltage within  $\pm$  5% rated voltage
  - (3) Testing conditions: Low-temperature start with cycling between hightemperature testing at 125°C (30 min.) with preheat of 145°C and lowtemperature testing at -40°C (30 min.) with precool of -60°C, two-zone testing, with sample (listed per model in the standard specification table; includes weight of plastic molded IC and sample loading jig)
- (4) No testing cycle suspension and no testing chamber door opening/closing
   \*7. The maximum load current is the value at an ambient temperature of 20°C, coolant inlet temperature of 25°C, and the specified power supply voltage.
- 8. The following must be provided separately.
   8. The following must be provided separately.
- \*8.1. Power supply: Power supply wiring and ground wire are not included. These will need to be prepared and connected separately.
  \*8.2. Dry air: Dry air will need to be supplied for damper operation.
- (There is a compressed air unit [pressure gauge and pressure reducing valve] built into the system.)



\*8.3. Coolant: The included Y strainers will need to be connected to the coolant inlet piping for the coolant condenser to supply coolant through the Y strainers. There are two Y strainers included, and they must be connected in parallel. The strainers will need to be maintained while the system is running. A coolant inlet piping diagram is shown to the right. The coolant quality conforms to the JRAIA water quality standards.

- \*8.4. Drain piping: This is used for draining water.
- \*9. The value given for operational noise is at a location 1 m from the product front surface and 1 m above the floor, within an anechoic chamber or other location with little echo.

#### Dimensions

(Unit: mm)

#### ES-107LHH





ES-207LHH





\*Maintain the following conditions in the system installation area. (1) Waste heat handling

Waste heat (approx. 2.3 kW) will be generated around the system during

This can cause the room temperature to rise (especially in narrow areas) and hot air to stagnate around the system. Waste heat must be handled appropriately, through means such as ventilation and air conditioning. (2) Installation space

The system requires space for heat exhaust, air intake, maintenance, and inspection. Refer to the figure on the right, and ensure sufficient space from nearby walls and devices.



#### Options •

Item	Specification
Temperature recorder	Select either paperless or a paper chart (100 mm width; 1 pen, 6 dots).
Emergency stop switch	Shuts power down via the earth leakage circuit breaker.
Communication interface	Select either RS-232C, RS-485, or web interface (including Ethernet).
Communication interface cable	RS-232C: 4 m, 10 m
Cable hole	ø50 mm $ imes$ 1, added to standard cable hole (left side surface) area
Sensor switching function	Select either upwind side or downwind side for the testing chamber temperature control point (can be switched).
Internal air compressor	Air compressor output 0.2 kW
Power supply terminal block for air compressor connection	For three-phase 200V 0.2 kW or 0.4 kW
Cycle counter	Eight digits, with or without reset function
Signal indicator	Three colors (Green: Operating, Yellow: Power supply, Red: Error)
Sample temperature monitor system	Begins testing time count based on the measured surface temperature of the sample.
Casters, level adjusters	For moving/installing system

\*We offer a wide range of options to suit various needs. (Refer to P33 through P36.)

# MIL Standard\* Type Air flow Type

### Compliant with MIL standards

Lineup								
Туре	Cooling method	Testing chamber volume (L) 70						
MIL Standard	Water- cooling	ES-76LM						

\*MIL standard: Standard for environmental resistance testing that establishes specifications for materials procured by the U.S. Department of Defense.



ES-76LM

Photo for illustrative purposes only. (Includes optional specification [temperature recorder])

#### **MIL standard testing**

The system comes configured with temperature cycle testing patterns that are compliant with MIL standard tests. Simply specify the pattern number to conduct temperature cycle testing compliant with MIL standards.

Pattern	Sources of	High-temp test conditions			Room temp	Low-temp test conditions			Test cycles	Defrost cycles
No.	Test standards	Test temp	Preheat temp	Test time	test time	Test temp	Precool temp	Test time	count	count
31	MIL-STD-883C 1010.6 A	85℃	115℃	15 min.	_	−55℃	−75℃	15 min.	10 times	10 times
32	MIL-STD-883C 1010.6 B	125℃	155℃	15 min.	_	−55℃	−75℃	15 min.	10 times	10 times
33	MIL-STD-883C 1010.6 C	150℃	180℃	15 min.	_	−65℃	−80℃	15 min.	10 times	10 times
34	MIL-STD-883C 1010.6 D	150℃	180℃	30 min.	_	−65℃	−80℃	30 min.	10 times	10 times
46	MIL-STD-202F 107G A	85℃	115℃	4 hours	5 min.	−55℃	–75℃	4 hours	5 times	2 times
47	MIL-STD-202F 107G B	125℃	155℃	4 hours	5 min.	−65℃	-80℃	4 hours	5 times	2 times
48	MIL-STD-883B 1010.4 A	85℃	115℃	30 min.	5 min.	−55℃	–75℃	30 min.	10 times	10 times
49	MIL-STD-883B 1010.4 A	85℃	115℃	1 hour	5 min.	−55℃	–75℃	1 hour	10 times	10 times
50	MIL-STD-883B 1010.4 A	85℃	115℃	2 hours	5 min.	−55℃	−75℃	2 hours	10 times	5 times
51	MIL-STD-883B 1010.4 B	125℃	155℃	30 min.	5 min.	−55℃	–75℃	30 min.	10 times	10 times
52	MIL-STD-883B 1010.4 B	125℃	155℃	1 hour	5 min.	−55℃	–75℃	1 hour	10 times	10 times
53	MIL-STD-883B 1010. 4 BA	125℃	155℃	2 hours	5 min.	−55℃	–75℃	2 hours	10 times	5 times

\*Certain sample weight and placement conditions may not meet testing standards.

Depending on the sample's mass, placement, and ambient temperature, please input the appropriate setting values for test patterns 1 to 30 during the trial run.

\*MIL-STD-202: Standard for electronic components

MIL-STD -883: Testing standard for integrated circuits

#### Equipped with highly visible, user-friendly color LCD touch panel

All settings and switches are accessible from the LCD control panel.

- Menu screen
- Measurement screen
- Pattern combination screen Up to three operation patterns can be combined for testing.
- Error display screen
   Displays error details and possible solutions when operation is stopped due to an error.
- Pattern settings screen
- Trend graph screen
- Cycle counter screen
   This allows the cycle counter to be displayed, or testing to be suspended, after a certain number of cycles.
- Notes screen This function allows the LCD touch panel to be used as a notepad.

25

#### Specification table -

Category					MIL Standard Type		
I	tem			N	lodel	ES-76LM	
Туре				_	Stationary sample type, cool/hot air switchable, two/three zone switchable		
Temperature range Low-temperature testing		°C	-70 to 0				
	(testing chamber)*2 High-temperature testing		°C	60 to 200			
	Temperatu	re fluc	tuation	margin	°C	±0.5	
	Temperature rise ti	ime (higł	h-temperatu	ire chamber)	—	Room temperature to 200℃ : Within 15 min.	
-	Temperature drop	time (lov	<i>w</i> -temperatu	ure chamber)	—	Room temperature to $-75$ °C : Within 45 min.	
ert	Ter	Сус	cles		—	5 cycles (low-temperature start)	
forn	Sa	Т	уре		—	Plastic molded IC	
ma	mp	10/	loight		ka	5 kg (IC 3.5 kg + dual-stage jig 1.5 kg)	
nce	lire	vv	eigni		۳g	(Includes weight of sample loading jig)	
	Testing cha	mber	Low ten	nperature	_	-65°C /15 min.	
	temperatu	ure /	Room te	mperature	min.	—	
	Testing t	ime	High ten	nperature	_	150°C /15 min.	
	ਤੂ Temperatu	re mea	asuremen	t position		Downwind side	
	ର୍ନ୍ଧି Temper	ature	e return	time*5	_	Within 5 min.	
Cooling method					Water-cooling		
	ΕΕ	xterio	or		_	Cold-rolled steel plate, natural gray (Munsell code: 1.0Y8.5/0.5)	
Testing chamber volume			me	L	70		
Testing chamber Width		mm	390				
	dimensions		mm	390			
				Height	mm	460	
	Prod	uct		Width	mm	1,300	
	dimen	sions		Depth	mm	1,555	
				Height	mm	1,900	
Pe	rmissible sample v	veight ir	nside testir	ng chamber	kg	30	
R	efrigerant type	High-	tempera	ture side	—	R404A	
		Low-	tempera	ture side	—	R23	
	Opera	itiona	al noise		dB(A)	65dB (A)	
Safeguards		_	Earth leakage circuit breaker, electric motor overload safeguard, electrical fuse, high-voltage shutdown system for refrigerator, operation with door open prevention switch, excess temperature increase prevention system, and temperature fuse				
Accessories		-	Cable hole soft silicon plug $\times$ 1, sample shelf $\times$ 2, shelf support $\times$ 4, operation circuit protection fuse $\times$ 2, coolant piping Y strainer (teethed and plugged) $\times$ 2 sets, and instruction manual $\times$ 1				
	Dracoir		Pressu	ire	MPa	0.4 to 0.7	
	Diyali	C	onsum	otion	L(ANR)	Approx. 7.6 per cycle	
	Coola	nt an	nount*3		L⁄h	4,200	
	Pow	/er su	pply		—	Three-phase 200V 50/60Hz, Three-phase 220V 60Hz, Three-phase 380V 50Hz	
Ma	aximum load curre	ent <sup>*4</sup> / P	ower supp	oly capacity	A/kVA	101 / 35	
Product weight				kg	1,150		

Notes: \*1: Performance based on following conditions.

	ES-76LM		
Tomporatura rico (drop timo	Ambient temperature	°C	20
remperature rise/drop time	Coolant inlet temperature	°C	25
	Ambient temperature	°C	10 to 30
remperature return time	Coolant inlet temperature	Ĉ	15 to 30
Operable range	Ambient temperature	ĉ	0 to 40
Operable range	Coolant inlet temperature	°C	5 to 38

\*2: A high-temperature testing temperature of 80℃ or lower is possible only at an ambient temperature of 20℃ or lower. \*3: The coolant amount is based on a coolant inlet temperature of 32℃. Water pressure is from 0.1 to 0.5 MPa.

\*4: The maximum load current is the value at the specified power supply voltage, an ambient temperature of 20°C, and a coolant inlet temperature of 25°C (water-cooling only). \*5: The temperature return time is the point in time where the temperature reaches  $\pm 2$ °C of the set high temperature or low temperature.

### Options •

Item	Specification
Temperature recorder	Select either paperless or a paper chart (100 mm width; 1 pen, 6 dots).
Emergency stop switch	Shuts power down via the earth leakage circuit breaker.
Internal air compressor	Air compressor output 0.2 kW
Cable hole	$\emptyset$ 50 mm $\times$ 1, added next to standard cable hole (left side surface)
Sample basket	Permissible sample weight: 4 kg per shelf
Cycle counter	Eight digits, with or without reset function
Signal indicator	Three colors (Green: Operating, Yellow: Power supply, Red: Error)
Power supply terminal block for air compressor connection	For three-phase 200V 0.2 kW or 0.4 kW
Sensor switching function	Select either upwind side or downwind side for the testing chamber temperature control point (can be switched).
Sample temperature monitor system	Begins testing time count based on the measured surface temperature of the sample.
Communication interface	Select either RS-232C, RS-485, or web interface (including Ethernet)
Communication interface cable	RS-232C: 4 m, 10 m
Casters, level adjusters	For moving/installing system

\*We offer a wide range of options to suit various needs. (Refer to P33 through P36.)

#### Dimensions



1,555

H

 MIL Standard Type

# 250°C Type Air flow Type

Increased high-temperature testing temperature makes it possible to conduct the heat resistance evaluation

## testing required for conducting evaluation testing of power semiconductors\* (200 to 250°C).

#### \*Power semiconductor

A generic term for semiconductors used to control and supply power by converting AC to DC or by lowering the voltage from 5V to 3V to drive motors, charge batteries, or drive microcomputers and LSIs.

Lineup		
Туре	Cooling method	Testing chamber volume (L) 72
250°C	Water-cooling	ES76LM-M
Air-Cooling Remote Condenser	Air-cooling	ES76LM-RM

#### Temperature return time of within 10 min.

Capable of a temperature return time of within 10 min. from room temperature to high temperature at a high-temperature testing temperature of 250°C. (The temperature return time from room temperature to low temperature [-65°C] is also within 10 min.)

Testing conditions: 1 cycle (room temperature to low temperature [-65°C] for 30 min., then to room temperature for 5 min. and to high temperature [250°C] for 30 min. before returning to room temperature) Plastic molded IC 6.5 kg (including loading jig) 5 cycles Temperature return time: Within 10 min. (measuring air temperature on the

upwind side of the testing chamber)

#### Testing chamber door auto locking mechanism

The testing chamber door comes equipped with an auto locking mechanism as a standard.

#### Casters, level adjusters

Casters (for transporting the system) and level adjusters (for installing the system) come equipped as a standard.





ES-76LM-M (water-cooling)

Photo for illustrative purposes only. (Includes optional specification [temperature recorder])

#### Air-cooling specification available

Water-cooling and air-cooling (air-cooling remote condenser) are available. Select the cooling method that best suits the installation environment.



#### Standard specification table -

Category				250°C Type			
lte	em	N	lodel	ES-76LM-M	ES-76LM-RM		
	Тур	pe	—	Stationary sample type, cool/hot air switchable,	two/three zone switchable via damper switching		
Т	emperature range	Low-temperature testing	°C	- 70	to 0		
(1	esting chamber) *2	High-temperature testing	°C	60 to 250			
	Temperature fl	uctuation margin	Ĉ	±´	1.0		
Per	l emperati (high-temper	ature chamber)	_	Room temperature to	250℃ : Within 35 min.		
form	Temperatu (low-temperatu	ire drop time ature chamber)	_	Room temperature to -	– 75℃ : Within 70 min.		
Ian	Teg (	Cycles	—	5 cycles (low-ter	mperature start)		
Ce	Sample	Туре	—	Plastic m	olded IC		
*1 1		Weight	—	6.5 kg (includes weight	t of sample loading jig)		
yu	E Testing chamber	Low temperature	—	- 65 C /	/30 min.		
	g temperature /	Room temperature		Atmosphere tem	perature/5 min.		
		High temperature		25007.	30 min.		
2			_	Upwin	IO side		
				Water cooling	10 Min. Air Cooling Pomoto Condensor Type		
	COULING	rior	_		may (Munsell code: 1 0Y8 5/0 5)		
	Testing cham	her volume					
	i coung chan	Width	mm	315			
Te	sting chamber	Depth	mm	495			
	aimensions	Height	mm	460			
		Width	mm	1.565			
	Product	Depth	mm	1,6	40		
(	limensions	Height	mm	1,9	80		
P	ermissible samp testing c	le weight inside hamber	kg	30			
D		High-temperature side	_	R4C	)4A		
Rei	rigerant type	Low-temperature side	_	R2	23		
	Operation	al noise *3	dB(A)	6	5		
A	ir-cooling rem operatior	ote condenser nal noise	dB(A)	_	53/54		
Safeguards			_	Earth leakage circuit breaker, electric motor overload safeguard	d, electrical fuse, high-voltage shutdown system for refrigerator, erature increase prevention system, and temperature fuse		
Accessories			—	Cable hole rubber plug $\times$ 1, sample shelf $\times$ 2, shelf support $\times$ 4, operation circuit r	protection fuse $\times$ 2, instruction manual $\times$ 1, and Y strainer $\times$ 2 (water-cooling only)		
	Drupir	Pressure	MPa	0.4 to	o 0.7		
Dry air Consumption		L(ANR)	Approx. 7.6	6 per cycle			
	Coolant a	mount *6	L/h	4,200			
	Power	supply		Three-phase 200V 50/60Hz, Three-phase	se 220V 60Hz, Three-phase 380V 50Hz		
Maxi	mum load current *3 /	[Power supply capacity]	A/kVA	120	/42		
	Product	weight	kg	1,400	1,400 (not including weight of air-cooling remote condenser [135 kg])		
Air-	cooling remote	condenser weight	Kg		135		

Notes: \*1: Performance based on following conditions.

I	Nodel	ES-76LM-M	ES-76LM-RM	
Tomporatura rica (drop tima	Ambient temperature °C		23	23℃ (testing apparatus and air-cooling remote condenser)
remperature rise/drop time	Coolant inlet temperature	°C	25	_
Tomporature return time	Ambient temperature	°C	23	23℃ (testing apparatus and air-cooling remote condenser)
remperature return time	Coolant inlet temperature	°C	25	—
Operable range	Ambient temperature		0 to 40	0 to 40°C (testing apparatus and air-cooling remote condenser)
Operable range	Coolant inlet temperature	°C	5 to 38	_

\*2: A high-temperature testing temperature of 80°C or lower is possible only at an ambient temperature of 20°C or lower.

\*3: The value given for operational noise is at a location 1 m from the product front surface and 1 m above the floor, within an anechoic chamber or other location with little echo. Actual values may vary depending on actual installation conditions and ambient echoes.

\*4: The maximum load current is the value at a specified power supply voltage an ambient temperature of 20°C, and a coolant inlet temperature of 25°C (water-cooling only). \*5: The temperature return time is the point in time where the temperature reaches  $\pm 2$ °C of the set high temperature or low temperature, from zone switching.

\*6: The coolant amount is based on a coolant inlet temperature of 32°C. Water pressure is from 0.1 to 0.5 MPa.

\*Refer to the coolant piping connection diagram on P17 for information on connecting coolant piping.

#### Options

Item	Specifications			
Temperature recorder	Select either paperless or a paper chart (100 mm width; 1 pen, 6 dots).			
Emergency stop switch	Shuts power down via the earth leakage circuit breaker.			
Internal air compressor	Air compressor output 0.2 kW			
Cable hole	ø50 mm $ imes$ 1, added next to standard cable hole (left side surface)			
Sample basket	Permissible sample weight: 4 kg per shelf			
Cycle counter	Eight digits, with or without reset function			
Signal indicator	Three colors (Green: Operating, Yellow: Power supply, Red: Error)			
Power supply terminal block	For three-phase $2001/0.2 kW$ or $0.4 kW$			
for air compressor connection				
Sensor switching function	Select either upwind side or downwind side for the testing tank temperature control point (can be switched).			
Sample temperature	Begins testing time count based on the measured			
monitor system	surface temperature of the sample.			
Communication interface	Select either RS-232C, RS-485, or web interface (including Ethernet).			
Communication interface cable	RS-232C : 4m,10m			

#### Dimensions

#### ES-76LM-M•ES-76LM-RM

#### Remote Condenser 1,640 1,565 RCR-R10F an jan 950 1,980 1,645 ..... ----D æ VI

\*We offer a wide range of options to suit various needs. (Refer to P33 through P36.) (Unit: mm)

Air-Cooling

# High Capacity Type Air flow Type

# Higher testing chamber capacity to handle large samples

Testing chamber volume 1,000L / 1,500L / 2,500L 2,900L / 3,100L / 5,500L <sup>class</sup>





Photo for illustrative purposes only. (Includes optional specification [temperature recorder])

Dete for illustrative pu

Photo for illustrative purposes only.

#### Lineup

Tuno	Cooling	Testing chamber volume (L)						
туре	method	1,080	1,450	2,448	2,880	3,130	5,438	
High Capacity	Water-cooling	ES-1006L/ES-1006LH	ES-1506L	ES-2506L	ES-2906L	ES-3106L	ES-5506L	
Air-Cooling Remote Condenser	Air-cooling	ES-1006L-R	ES-1506L-R	_	_	_		

#### Standard-equipped with casters and level adjusters

Casters and level adjusters (for transporting and installing the system) come equipped as a standard. (Unit: mm)

	Product dimensions	Testing chamber dimensions
,000L	W2,355×D1,805×H2,200	W1,450×D1,000×H750
,500L	W2,355×D1,820×H2,450	W1,450×D1,000×H1,000

Jses (	a split structure.	(Unit: mm)
	Product dimensions	Testing chamber dimensions
2,500L	W2,800×D3,270×H2,180	W1,700×D1,200×H1,200
2,900L	W3,100×D3,270×H2,180	W2,000×D1,200×H1,200
3,100L	W3,365×D3,520×H2,300	W1,800×D1,450×H1,200
5,500L	W4,065×D3,620×H2,620	W2,500×D1,450×H1,500

#### Air-cooling specification available

Select the cooling method that best suits the installation environment.

Product dimensions are the same as for the water-cooling specification.



### Function

1

Function	Contents
End condition setting	Allows the selection of end conditions after the temperature cycle operation has ended. •Stop after drying operation •Stop after room temperature operation •Stop after defrosting operation •Preparation operational status
Operation mode setting	Allows the operation mode to be selected based on testing. • Energy saving • Standard • High load • Reduced power operation
Trend graph	Displays trend graphs (with scrolling).
Test pattern name input	Allows names to be registered to test operation patterns (up to 10 alphanumeric characters).
Timer	Allows operation to start/stop on a timer in one of three modes (once, daily, day of the week).
Cycle suspension	Allows an operation to be suspended after the specified number of cycles.
Notepad	Allows notes (text, sketches, etc.) to be written on the LCD panel.

#### Options -

Item	Specification
Temperature recorder	Select either paperless or a paper chart (100 mm width; 1 pen, 6 dots).
Emergency stop switch	Shuts power down via the earth leakage circuit breaker.
Internal air compressor	Air compressor output 0.2 kW
Cable hole	ø50 mm $ imes$ 1, added next to standard cable hole (left side surface)
Sample basket	Permissible sample weight: 4 kg per shelf
Cycle counter	Eight digits, with or without reset function
Signal indicator	Three colors (Green: Operating, Yellow: Power supply, Red: Error)
Power supply terminal block for air compressor connection	For three-phase 200V 0.2 kW or 0.4 kW
Sensor switching function	Select either upwind side or downwind side for the testing chamber temperature control point (can be switched).
Sample temperature monitor system	Begins testing time count based on the measured surface temperature of the sample.
Communication interface	Select either RS-232C, RS-485, or web interface (including Ethernet).
Communication interface cable	RS-232C: 4 m,10 m

\*We offer a wide range of options to suit various needs. (Refer to P33 through P36.)

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#### Specification table=

Category						High Capacity Type				
Mo			lodel	ES-1006L	ES-1006LH	ES-1006L-R	ES-1506L	ES-1506L-R		
Type				Statio	Stationary sample type, cool/hot air switchable, two/three zone switchable					
	Testing	Low-temperature testing	_	– 50 to – 10℃	- 50 to - 10°C - 50 to - 10°C					
Impleature range *1     High-temperature testing     —     60 to 120°C     60 to 200°C     60 to 120°C										
	Temperature fl	uctuation margin				± 0.5				
Pe	Temperati (high-tempera	ure rise time ture chamber) *2	—		Room temp	erature to 130℃ : Wit	hin 30 min.			
erfor	Temperatu (low-tempera	re drop time ture chamber) *2	_		Room tempe	erature to − 70°C : Wi	thin 75 min.			
ma .		Cycles	—		5 сус	les (low-temperature	start)			
nc	Testing chamber	Low temperature	—			- 35°C / 30 min.				
	P Testing time	High temperature	_							
			_							
	Sample	Type	_		Plas	tic molded IC. iron bl	ock			
-1	C Sam (includes lo	ole weight ading jig weight)	_		50 kg (equiva 100 kg (equiva	alent to iron block) / \ alent to iron block) / \	Vithin 5 min. Vithin 10 min.			
	Cooling	method	_	Water-cooling   Air-Cooling Remote Condenser Type   Water-cooling   Air-Cooling Remote Condenser Type						
Exterior –			_		Cold-rolled steel plat	e, natural gray (Munse	ell code: 1.0Y8.5/0.5)	1 ···· 0 ····· 0 ····· //··		
Testing chamber volume			L		1,080		1,4	150		
Тс	sting chamber	Width	mm			1,450				
	dimensions	Depth	mm		1,000					
		Height	mm	/50 1,000				000		
	Product	VViath	mm		2,355					
	dimensions	Height	mm		2 200		1,C	150		
F	Permissible same	le weight inside								
	testing c	hamber High tomporaturo	kg		100 (sample a	and shelf 25 kg $\times$ 4 sh	nelves or less)			
	Refrigerant	side	_			R404A				
	U U	side	—		R23					
	Operation	al noise *4	dB(A)	65						
Safeguards —			_	Earth leakage circuit breaker, electric motor overload safeguard, electrical fuse, excess temperature increase prevention system, operation with door open prevention switch, temperature fuse, and high-voltage shutdown system for refrigerator						
Accessories —			_	Cable hole rubber plug × 1, sample shelf × 2, shelf support × 4, operation circuit protection fuse × 2, instruction manual × 1, and Y strainer × 2 (water-cooling only)						
Dry pir Pressure MP			MPa			0.4 to 0.7				
	Diyali	Consumption	L(ANR)			Approx. 7.6 per cycle				
	Coolant a	mount *5	L⁄h	4,2	00	-	4,200	-		
	Power	supply		I hree-p	nase 200V 50/60Hz,	Inree-phase 220V 60	Hz, Three-phase 380	V 50Hz		
IVIAX		/ Power supply capacity	A/KVA	150 / 52	1 900	159	/ 55	)EO		
	Air-Cooling Pom	ote Condenser	Kg ka		1,000	135		135		
Air-Cooling Remote Condenser			l vr			155		155		

Notes: \*1: Can be operated as follows: Water-cooling: Ambient temperature from 0 to 40°C, coolant inlet temperature from 5 to 38°C, and power supply voltage within ±10% rated voltage. Air-cooling remote condenser: Ambient temperature (testing apparatus and air-cooling remote condenser) from 0 to 40°C, and power supply voltage within ±10% rated voltage. \*2: Performance is as follows:

Water-cooling: Ambient temperature from 10 to 30°C, ambient humidity from 30 to 60%, coolant inlet temperature from 15 to 30°C, and power supply voltage within ±5% rated voltage. Air-cooling remote condenser: Ambient temperature (testing apparatus and air-cooling remote condenser) of 23°C, ambient humidity from 30 to 60%, and power supply voltage within ±5% rated voltage. However, conditions will vary for the following:

\*2.1: A high-temperature testing temperature of 80°C or lower is possible only at an ambient temperature of 20°C or lower.

\*2.2: Temperature rise time and drop time are as follows:

Water-cooling: Ambient temperature of 20°C and coolant inlet temperature of 25°C.

Air-cooling remote condenser: Ambient temperature (testing apparatus and air-cooling remote condenser) of 20°C.

\*2.3: The temperature return time is the point in time where the temperature reaches  $\pm 2^{\circ}$ C of the set high temperature or low temperature.

\*3: The maximum load current is as follows:

Water-cooling: The value at an ambient temperature of 20°C, coolant inlet temperature of 25°C, and the specified power supply voltage. Air-cooling remote condenser: The value at an ambient temperature (testing apparatus and air-cooling remote condenser) of 20°C and the specified power supply voltage.

\*4: The value given for operational noise is at a location 1 m from the product front surface and 1 m above the floor, within an anechoic chamber or other location with little echo. Actual values may vary depending on actual installation conditions and ambient echoes.

\*5: The coolant amount is based on a coolant inlet temperature of 32°C. Water pressure is from 0.1 to 0.5 MPa.

#### Dimensions

ES-1006L•ES-1006LH•ES-1006L-R•ES-1506L•ES-1506L-R







a standard.

High Capacity Type

#### Specification table

Category						High Capacity Type				
Item Model			lodel	ES-2506L	ES-2906L	ES-3106L	ES-5506L			
Type —					—	Stationary s	Stationary sample type, cool/hot air switchable, two/three zone switchable			
	Testing temperate	rature Low-temperature testing °C		Ĉ	-60 to 0	-60 to 0 -65 to 0 -50				
	range <sup>*1</sup>	High-te	emperatu	re testing	Ĉ		60 to 130		60 to 120	
	Temperatur	re fluctua	ation m	nargin	Ĉ		± (	0.5		
	Temperature rise tin	ne (high-temp	perature c	hamber)*2	_	Room temperature to	150°C : Within 60 min.	Room temperature to 150°C : Within 20 min.	Room temperature to 150°C : Within 90 min.	
Pe	Temperature drop ti	ime (low-temp	perature c	hamber)*2	—	Room ten	nperature to −70°C : Withi	n 90 min.	Room temperature to -70°C : Within 120 min.	
rfc	_	Cycles	S		—		5 cycles (low-te	mperature start)		
rm	음 Testing cha	amber Lo	w temp	perature	—	−35℃ /30 min.	-40℃ /30 min.	−40°C /30 min.	−30°C /30 min.	
an	g temperatu	ure / Ro	om tem	perature	—		-	_		
e	Testing ti	ime Hig	gh temp	perature	—	85℃ /30 min.	120°C /	30 min.	70℃ /30 min.	
	Temperatur	re measur	rement p	position	—		Upwin	d side		
	Sampl	le	Тур	be	—		Iron I	olock		
	Sample weig jig weight) /	ht (include: Temperati	es sample ure retur	e loading 'n time <sup>*3</sup>	-	150 kg (equivalent to iron block) / Within 10 min.	100 kg (equivalent to iron block) / Within 10 min.	200 kg (equivalent to iron block) / Within 5 min.	400 kg (equivalent to iron block) / Within 5 min.	
	Cooling method —			_	Water-cooling					
	Exterior —			_	Cold-rolled steel plate, natural gray (Munsell code: 1.0Y8.5/2.5)					
	Testing chamber volume		L	2,448	2,880	3,130	5,438			
	Width		mm	1,700	2,000	1,800	2,500			
	dimens	sions		Depth	mm	1,2	200	1,4	150	
	Gimen	510115		Height	mm	1,200			1,500	
	Drad	uct		Width	mm	2,800	3,100	3,365	4,065	
	dimens	sions		Depth	mm	3,2	.70	3,520	3,620	
	Girriens			Height	mm	2,1	80	2,300	2,620	
P	ermissible sa testin	ample w Ig cham	veight Iber	inside	-	150 kg (max.) (sample and shelf 30 kg × 5 rows or less)		200 kg (max.) (sample and shelf 40 kg $\times$ 5 rows or less)	400 kg (max.)	
D	frigorant tuna	High-tem	nperatu	ire side	_		R40	)4A		
R	eingerant type	Low-tem	nperatu	ire side	—		R2	23		
	Opera	tional n	noise		dB(A)	7	0	70	D*4	
	Saf	feguards	S		_	Earth leakage circuit breaker, electric motor overload safeguard, electrical fuse, excess temperature increase prevention system, operation with door open prevention switch, temperature fuse, and high-voltage shutdown system for refrigerator				
	Accessories —			_	Cable hole rubber plug $\times$ 1, san	nple shelf $\times$ 2, shelf support $\times$ 4,	operation circuit protection fuse	imes 2, and instruction manual $ imes$ 1		
	Druceir	Pr	ressure	e	MPa		0.4 te	o 0.7		
	Dry all	Con	sumpt	tion	L(ANR)		Approx. 20	) per cycle		
	С	Coolant			—	Volume: 8,40	0 L $\nearrow$ h (coolant inlet temp	oerature 32℃ ), Pressure: C	).1 to 0.5 MPa	
	Pow	er supp	oly		—	Three-phase	200V 50/60Hz, Three-pha	se 220V 60Hz, Three-phas	e 380V 50Hz	
Ma	iximum load curre	ent <sup>*3</sup> /Powe	er supply	capacity	A/kVA	365 /	/ 130	365 /	/ 130	
	Prod	uct weig	ght		kg	3,550	3,950	4,500	5,550	

Notes: 1. Can be operated in an ambient temperature from 0 to 40°C, a coolant inlet temperature from 5 to 38°C, and a power supply voltage within ±10% rated voltage.
2. Performance values are given under these conditions: (1) ambient temperature from 10°C to 30°C, ambient humidity from 30 to 60%, and coolant inlet temperature from 15 to 30°C, and (2) power supply voltage within ±5% rated voltage. However, conditions will vary for the following:
\*1: A high-temperature testing temperature of 80°C or lower is possible only at an ambient temperature of 20°C or lower.
\*2: The temperature rise time and drop time are at an ambient temperature of 20°C and a coolant inlet temperature of 25°C.
\*3: The temperature return time is the point in time where the temperature reaches ±2°C of the set high temperature or low temperature.
3. The maximum load current is the value at an ambient temperature of 20°C, coolant inlet temperature of 25°C, and the specified power supply voltage.
4. 76 dB (A) during waste heat operation and room temperature operation.

#### Dimensions –

ES-2506L+ES-2906L+ES-3106L+ES-5506L

(Unit: mm)





Model	а	b	с	d <sup>∗ 1</sup>
ES-2506L	2,800	3,270	2,180	1,475
ES-2906L	3,100	3,270	2,180	1,475
ES-3106L	3,365	3,520	2,300	1,725
ES-5506L	4,065	3,620	2,620	1,725

Note: Casters and level adjusters are equipped as a standard. \*1. Dimension d is the split portion depth.

## Thermal Shock testing apparatus: Function table

•					: Standa	tandard equipped, ×		<: N∕A,	O: Available as		option
	Functi	on	Con	tents	Basic Type	High Performance Type	MIL Standard	250℃	EXCELLE Air flow Type	NT SERIES	High Capacity Type
LCD control panel			Color LCD, touch panel	10.4-inch (vertical orientation), scrolling/swiping control	×	•	×	×	×	×	×
				8.4-inch (horizontal orientation)	•	×		•	•	•	•
	Operation mo	ode setting	Allows the operation mode t Energy saving, Standard, Higf	o be selected based on testing. n load	•	•	•	•	•	•	•
	Reduced	Reduced power	During the final testing cycle, ends	s testing							
	power operation	operation 1	and stops operating the chamber.				•	•	•		•
	function	Reduced power operation 2	Temporarily stops low-temperature ch testing, and high-temperature chambe	amber operation during high-temperature r operation during low-temperature testing.	•	•	•	•	•	×	•
	Test pattern	name input	Allows names to be registered to alphanumeric characters, or up	o test patterns (up to 10 single-byte to 5 double-byte characters)	•	•	×	×	×	×	×
			Allows names to be registered to test patter	ns (up to 10 single-byte alphanumeric characters)	×	×		•	•		
	Test pattern i	nput function	Allows up to 30 patterns to be inpu	ut (in addition to the 30 fixed patterns).							٠
	Test end con setting	ndition	Allows the selection of end conditions after Air flow Type: Dry, room temp Liquid Type: Room temperatur	er the temperature cycle operation has ended. perature, defrost, prepare re return, water separation, prepare	•	•	•	•	•	•	٠
	Trend graph	1	Display of trend graphs	5		•		•	•		
	Timer reserva	ation function	Allows operation to start/stop on a timer in or	ne of three modes (once, daily, or day of the week).			•				٠
	Cycle count Cycle	er suspension	The counter is capable of five operations, all with reset option. Allows operation to be suspended after the specified number of cycles as well.			•	•	•	•	•	•
	Stop action sel	ection function	Select from instant stop	o or cycle stop.	•				•		٠
	Suspend action s	election function	Select from instant sus	pend or cycle suspend.	•	•	•	•	•		٠
	Room temperature selection during select	e damper uspension function	Opens the room temperature damper when testing is suspended, allowing the testing chamber to return to room temperature.			•	•	•	•	×	•
	Room temperature damper selection during standby function		Opens the room temperature damper during standby, allowing the testing chamber to return to room temperature.*Standby: Defrosting during cycle operation		•	•		•	•	×	•
	Note functio	on	Allows notes (text, sketches, etc.) to be written on the LCD control panel.		•	•		•	•		•
	Language sw function	vitching	Allows the language displayed on the LCD control panel to be switched. Japanese, English, Chinese, and Korean			• ×	×	×	×	×	×
	Defrosting	Auto defrosting	Detects frost in the low-temperature chan	nber during operation, and performs defrosting.	•	•	•	•	•	×	•
	function	Manual defrosting	Defrosting can be started whether th	ne equipment is in operation or stopped.			•		•		•
	Shortcut key	registration	Allows frequently used to shortcut keys.	screens to be registered	×	•	×	×	×	×	×
US	B storage savi	ng function	This function saves information such as s	ystem testing data to a USB storage device.	•		0	0	0	0	0
	Trend graph function	storage	This function saves data fron the LCD control panel to a U	n trend graphs displayed on ISB storage device as CSV files.	•	•	0	0	0	0	0
	Data log function		If the system stops with an alarm due to ar the operational status of the system immed	n error being detected, this function saves diately prior to stopping to a USB storage device.	•	•	×	×	×	×	×
	Screenshot	function	Allows the current scree to a USB storage device	en to be copied and saved as image data.	×	•	×	×	×	×	×
Ex	External output terminal		A terminal block for providing ex	ternal reporting of the system status.	•			•	•		•
	External ala	rm	Reports system errors.		•		٠	•			•
	Sample power supply control		Reports whether the sys High/room/low-temperature Gas-Phase only) Reports the	stem is in cycle operation. operation (room temperature is operational status of the system.	•	•	٠	•	•	•	•
	Time signal		Prepare, high/room/low- (room temperature is Air	temperature, end, suspend flow Type only)	•	•	•	•	•	•	•
Water separation system Allows wa			Allows water mixed in be separated and eject	heat medium liquid to ted.	×	×	×	×	×	•	×

Air flow Type Liquid Type EXCELLENT SERIES EXCELLENT SERIES **Basic Type** 

### **Thermal Shock options**

#### Temperature recorder

Available options are 1 pen type, 6 dots type (1 dot used), 6 dots type (3 dots used), and paperless type (with memory card).



### Recorded temperature> Paperless Measurement points Air flow Type Liquid Type 1point Testing chamber Near sample basket 3points Testing chamber, high-temperature chamber, low-temperature chamber —

#### Emergency stop switch

非常停止

- An optional emergency stop switch can be added to stop the system during an emergency.
- The emergency stop switch turns OFF the earth leakage circuit breaker on the system to stop power from being supplied.

Note: Standard-equipped on some models

#### Communication interface functionality

RS-232C, RS-485, and a web interface (including Ethernet) are available as options for communication interface functionality. Either RS-232C, RS-485, or web interface (including Ethernet) can be installed to the system. Note: The 7-Inch Thermal Shock testing apparatus comes equipped with RS-232C as a standard. Selecting an option will remove RS-232C.

#### Cable hole(Air flow Type only)

- This can be used to insert a cable for powering samples, or a thermocouple for measuring sample surface temperature.
  A hole (Ø50) on the left side surface of the Testing chamber
- is available as an option. Silicon rubber plugs for cable holes are also available as an option.



#### Sensor switching function(Air flow Type only)

•Functionality to switch between upwind side or downwind side for the Testing chamber temperature control point is available as an option.

#### Water-cooling specification

The cooling method can be changed from the standard air-cooling specification to the water-cooling specification for the system.
Compatible with ES-57L, 107L, 66EX-L, and 96EX-L.

#### Internal air compressor(Air flow Type only)

 Adds an air compressor that is used to provide compressed air for the damper drive source inside the testing apparatus.



unu

#### Signal indicator

The optional signal indicator shows the operational status of the system. •Green: The system is running.

- •Yellow: The earth leakage circuit breaker is ON.
- •Red: The safeguard is operating and the system has stopped running.

#### Double doors specification

- This replaces the left-hand opening testing chamber door (standard specification) with double doors split down the middle.
- This does not alter the dimensions of the Testing chamber.

#### Power supply terminal block for air compressor connection(Air flow Type only)

• Adds a terminal block inside the control board for connecting the power supply for the air compressor (prepared on site) used to provide compressed air for the damper drive source.

#### Cycle counter

- •Displays testing cycles.
- 8-digit display.Available with or
- without reset function.



#### Sample basket (Air flow Type only)

•For testing ICs and other small samples



#### Improvement of Shelf Board weight load capacity (Air flow Type only)

Improving the load capacity of the shelves by strengthening the shelf bracket.



#### Sample temperature monitor system(Air flow Type only)

This function measures the surface temperature of the sample, and begins the testing time count once the measured surface temperature of the sample inside the testing chamber reaches either the set high-temperature or low-temperature testing temperature.

#### Alternate voltage specification

Alters the voltage/frequency from 200V (Japan) for use overseas (contact us for details).

#### Liquefied nitrogen gas injector(Air flow Type only)

- •Provides additional cooling during low-temperature testing when testing many samples, by injecting liquefied nitrogen gas into the testing chamber.
- •Equipped with control switch, injection time setting timer, and nitrogen gas connection port.

#### Auto heat medium liquid filling system(Liquid Type only)

This function automatically adds heat medium liquid to the low-temperature chamber when the amount of heat medium liquid in the low-temperature chamber is low.

Item	Specification					
Spare tank volume	20L					
Note: Heat medium liquid not included.						

#### High-temperature specification(Liquid Type only)

Increases the upper range of the high-temperature testing temperature range to 200°C.

Setting range	Specification				
High-temperature testing temperature	70 to 200℃				
Preheating temperature	High-temperature testing temperature to 200℃				
Note: The heat medium liquid indicated in the specification table (Galden D02TS) cannot					

te: The heat medium liquid indicated in the specification table (Galden D021S) can be used when the high-temperature testing temperature is 151°C or higher.

#### Sample temperature measurement terminal(Liquid Type only)

Adds a terminal block for thermocouples inside the testing chamber and control board.

Setting range	Specification
Thermocouple type	For T thermocouple
Terminals	1 or 5 points
Note: Thermocouple not included.	

Sample temperature measurement terminal Sample temperature measurement terminal

#### **Communication interfaces**

Communication interfaces can be used to control the system or take measurements from an external PC or user system.



#### Overview of the web interface (optional circuit board)



The operational status can be monitored and the testing apparatus can be controlled even from a remote location. It is controlled using a web browser, so there is no need to install any specialized software on devices. It can be used with a PC, smartphone, or tablet.

Email notifications can be sent when there is a change in the status of the testing apparatus (for example, if an alarm occurs, testing starts or ends, or operation starts or stops).







\*Photos and illustrations for illustrative purposes only.

\*An email server is required to use the email transmission function. Only a single unit can be operated if multiple devices are connected. A wireless LAN environment is required to use the wireless LAN. \*Not compatible with Liquid Type Thermal Shock testing apparatuses.

#### Thermal Shock testing apparatus options

$lacksim$ : Standard equipped, $\bigcirc$ : Available as option, $ imes$ : Not available as optic								
	Item	Basic Type	High Performance Type	MIL Standard Type	250°С Туре	EXCELLENT SERIES Air flow Type Liquid Type		High Capacity Type
	Model	ES-57L ES-107L	ES-77LH ES-107LH ES-207LH ES-307LH ES-107LHH ES-207LHH ES-77LH-R ES-107LH-R ES-207LH-R ES-207LH-R	ES-76LM	ES-76LM-M ES-76LM-RM	ES-76EX ES-206EX	ES-66EX-L ES-96EX-L	ES-1006L ES-1006LH ES-1506L ES-2506L ES-2906L ES-3106L ES-5506L ES-1506L-R
Temperature	e recorder	0	0	0	0	0	0	0
Emergency s	stop switch	0	0	0	0	0	•	0
Communication	RS-232C *1	•		0	0	0	0	0
Interface	RS-485 *1	0	0	0	0	0	0	0
	Web interface (including Ethernet) *1*2*4	0	0	0	0	0	○*5	0
Communication interface cable		0	0	0	0	0	0	0
Cable hole		0	0	0	0	0	×	0
Sensor switching function		0	0	0	0	0	×	0
Double doors specification		×	○*3	×	×	×	×	
Internal air compressor		0	0	0	0	0	×	0
Power supply terminal	l block for air compressor connection	0	0	0	0	0	×	0
Cycle counte	er	0	0	0	0	0	0	0
Signal indica	itor	0	0	0	0	0	0	0
Sample tempe	erature monitor system	0	0	0	0	0	×	0
Increased samp	ole shelf permission weight	0	0	0	0	0	×	0
Sample basket		0	0	0	0	0	×	0
Water-coolir	Water-cooling specification		×	×	×	×	0	×
Liquefied nitrogen gas injector		0	0	0	0	0	×	0
Auto heat med	dium liquid filling system	×	×	×	×	×	0	×
High-temperature specification (high-temperature testing from 70°C to 200°C)		×	×	×	×	×	0	×
Sample temperature measurement terminal		×	×	×	×	×	0	×
USB storage	saving function	•		0	0	0	0	0
Data log fun	ction	•		×	×	×	×	×
Alternate	220V/60Hz	0	0	0	0	0	0	0
specification	380V/50Hz	0	0	0	0	0	×	0

\*1. Either RS-232C, RS-485, or web interface (including Ethernet) can be installed to the system as the communication interface.
\*2. Web interface functionality can be installed on some older models. Contact us for details.
\*3. Supports only 200 L or 300 L for the testing chamber volume.
\*4. Ethernet is integrated with web interface. Select web interface if Ethernet is required.
\*5. Liquid Type Thermal Shock testing apparatuses do not support web interface (only Ethernet functionality can be used). Contact us for other special specifications.

#### memo


#### memo


SAFETY PRECAUTIONS

- Read the Instruction Manual thoroughly prior to use, to ensure that the system is used properly.
  Do not bring volatile or flammable objects inside the testing room. Doing so could cause an explosion. Do not use the system for conducting carbide floating tests, testing living things such as animals or plants, or testing materials that could corrode substances such as stainless steel, resin, and silicon.
- The products described in this catalog are for indoor use only. Use and store products away from rain.
   Installation work and electrical work are required. Contact your place of purchase or a qualified
  - service contractor for support.

- Refrigerant

The disposal of testing apparatuses (refrigeration cycle) requires separate fees for the recovery, transportation, and destruction of fluorocarbons, in compliance with the Act on Rational Use and Proper Management of Fluorocarbons.

#### Installation precautions

- 1. Do not install in environments with corrosive gas atmospheres such as hydrogen sulfide.
- 2. Do not install near flammable or explosive materials, or near high-temperature heating elements.
- 3. If installing in a location with devices that generate electromagnetic waves or noise, avoid installing the system in such a way that it directly faces these devices. Install the system at least three meters away from these devices to avoid the effects of noise propagation in the air.

Manufactured by

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https://www.cosmopia.co.jp



We may provide personal information to our parent company group or partner companies in order to handle your inquiry or request.

For reliable and attentive service, contact:

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