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# SPECIFICATIONS for Constant Temperature Chamber

## [ Excellent Series ]

	Model ( ○ Mark)
Series	E X T H
Standard	○ EC-135EXTH20A

Note. An additional specification with the option depends on the attached paper option part list.

	Item		Specification
Performance * 1 * 2 * 3 * 8 * 11	Temperature Detection method		Dry bulb Temperature Method
	Temperature Range		-50~+150°C
	Temperature Fluctuation	+100.0°C and Under	±0.3°C
		+100.1°C and Over	±0.5°C
	Temperature Gradient	+100.0°C and Under	4.0°C
		+100.1°C and Over	7.0°C
	Temperature Variation in space	+100.0°C and Under	3.0°C
		+100.1°C and Over	5.0°C
	Temperature Rate of Change (Set temp. from +150 ~ -50°C)	Fall	20 °C/min for +130°C to -40°C (Temperature change average)
		Rise	20 °C/min for -40°C to +130°C (Temperature change average)
	Achieved Time for Temperature Extremes (No load, No sample)	Fall	Within 10 min for +20°C to -50°C
Rise		Within 10 min for +20°C to +150°C	
Test chamber inner capacity		1260L	
Test chamber dimensions (WxDxH) * 6		1,050mm×1,000mm×1,200mm	
Product dimensions (WxDxH) * 6		1,520mm×3,535mm×2,048mm	

### Attention

These specifications are plans.  
It may be changed by a detailed design.

DWN	K.Matsushita	08-11-2017	TITLE	Hitachi-Johnson Controls Air Conditioning, Inc.	SHIMIZU WORKS DWG.NO.	REGD
CHKD	K.Matsushita	08-11-2017	EC-135EXTH20A Specifications(1/6)	Hitachi-Johnson Controls Air Conditioning, Inc.	20171108-1A	
APPD	K.Matsushita	08-11-2017				

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Item			Specification	
Materials	Trim	Test chamber Control Panel Machine Compartment	Cold Rolled Steel Sheet(Paint Color: Dark gray)	
		Inner Test chamber	Stainless Steel Sheet (SUS304, 2B Polish Finish)	
Structural	Heat insulator	Test chamber	Hard Polyurethane Form Glass wool	
		Door	Hard Polyurethane Form Glass wool	
Construction	Refrigerating		Mechanical Single Step Compression and Cascade refrigerating System	
	Refrigerant	Single Step	R404A (Compressor output:7.4kW+7.4kW)	
		High/Low	R404A/R23 (Compressor output: 7.4kW/6.0kW+7.4kW/6.0kW)	
	Cooler and Dehumidifier		Multi Pass Cross Finned Type	
Condenser		Water Cooled Type (Plate type)		
Heater	Type		Nichrome Strip Wire Heater (25kW × 2)	
Fan	Type		Sirocco Fan (0.75kW × 2)	
Controller	Operation mode		Constant value mode or program mode or temperature cycle mode	
	Constant value mode or program mode	Temperature setting range		-52.0~+152.0°C
		Time setting range	Constant value mode	0~20000hr 59min
			Program mode	0~999hr 59min
		Setting resolution		Temperature 0.1°C, Time 1min
		No. of steps		20 Steps/1 Programmed pattern
		No. of program patterns		Input (RAM) pattern : Max 22 patterns
		No. of repetitions		Max 98 and infinite
		No. of overlap repetitions		Max 3 overlapped times
Detector probe		Pt 100Ω (at 0°C), Class B (JIS C 1604-1997)		

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Item			Specification	
Controller	Temperature Cycle Mode *9	Temperature setting range	High temp. soak	+60~+150°C
			Low temp. soak	-50~0°C
		Time setting range		1min~99hr 59min
		Ramp rate setting range	High temp. soak	5~25°C/min
			Low temp. soak	5~25°C/min
		Setting resolution		Temperature 0.1°C, Time 1min
		No. of cycle		1~20,000
		No. of pattern		Input (RAM) Pattern : Max 10 Pattern Included (ROM) pattern : 13 patterns
		Detector probe	Air temp.	Pt 100Ω (at 0°C), Class B (JIS C 1604-1997)
	Sample temp. *10		Pt 100Ω (at 0°C), Class B (JIS C 1604-1997)	
Indication accuracy		Temperature ±0.8°C(typ.), Time ±100PPM		
Control function		Time division PID function		
Standard Function			Fast-forwarding function, Standby function, Set value maintenance function, Power failure protection function, Electric work selection function again, Drive maintenance function, Program name input function, Program drive repeat function, Program combination function, Timer reservation function, Time signal output function, Over-heating/cooling prevention function, Warning display function, External warning output function, Operation mode select function, Display function of multiplication drive time, Ramp control select function	
Control Panel	Standard Equipment		LCD Operation Panel (Touch Panel Input Type), Operation Lamp (Power, Run, Warning), Sample Power Control Terminals, External Warning Terminals, Time Signal Output Terminals, Power Supply Cord Connection	

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Item		Specification
Protection Devices	Refrigerant Cycle	Overload Protection Device, High Pressure Shutoff Device
	Heater	Over-temperature Prevention Device, Temperature Fuse
	Fan	Overload Protection Device
	Control Panel	Leakage Breaker, Fuse, Over-temperature Prevention Device(for Test Chamber Room), Overheating and Overcooling Prevention Device (for Test Chamber Room, In Microprocessor)
Equipment (Number)	Cable Hole	Inner Diameter 50mm (1)
	Caster	(8)
	Level Adjuster	(8)
Accessories (Number)	Shelf Supports * 7	Made of stainless steel, Shelf Supports (4)
	Y-strainer	For cooling water piping (2)
	Manual	(1)
	Others	Rubber plug(for Cable Hole) (1)
Electric Characteristics	Power Supply * 4.1	AC 3Φ 380V 50Hz
	MAX Load Current * 5	170A
	Leakage Breaker Capacity	250A
		Sensitivity Current 30mA
	Power Supply Cable Diameter	80mm <sup>2</sup> (Cabtire Cable)
	Ground Cable Diameter	22 mm <sup>2</sup>
Cooling water * 4.2	Volume of water	17,400L/h (For 32°C in water temperature)
	Hydraulic pressure	0.1~0.5MPa
	Device side piping diameter	Rc 2
Piping * 4.3	Drain hole	Rc1/2
Product Weight		2,000kg

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NOTE

1. Operating allowable range

Ambient temperature 0°C to 40°C、Cooling-water inlet temperature 5°C to 38°C、Power source nominal voltage ±10% or less.

2. Performance data are comforted to JTM K09 standard at the following conditions.

( 1 ) No load, No sample

( 2 ) Power source nominal voltage ±5% or less

( 3 ) Ambient Temperature 5°C to 35°C, cooling-water inlet temperature 15°C to 30°C

However, note that the following conditions.

( I ) Achieved time for temperature extremes and temperature rate of change are in the following conditions on 『Hi-speed』 function set、Ambient temperature is 23°C、cooling-water inlet temperature is 25°C、And waterless humidification water reservoir.

(Average heat-up/cool-down rate will not cover the entire span of the temperature rise/drop.)

『High speed heat-up/cool-down』 setting is made valid in the constant temperature run mode, in which humidity designation or control is disabled.

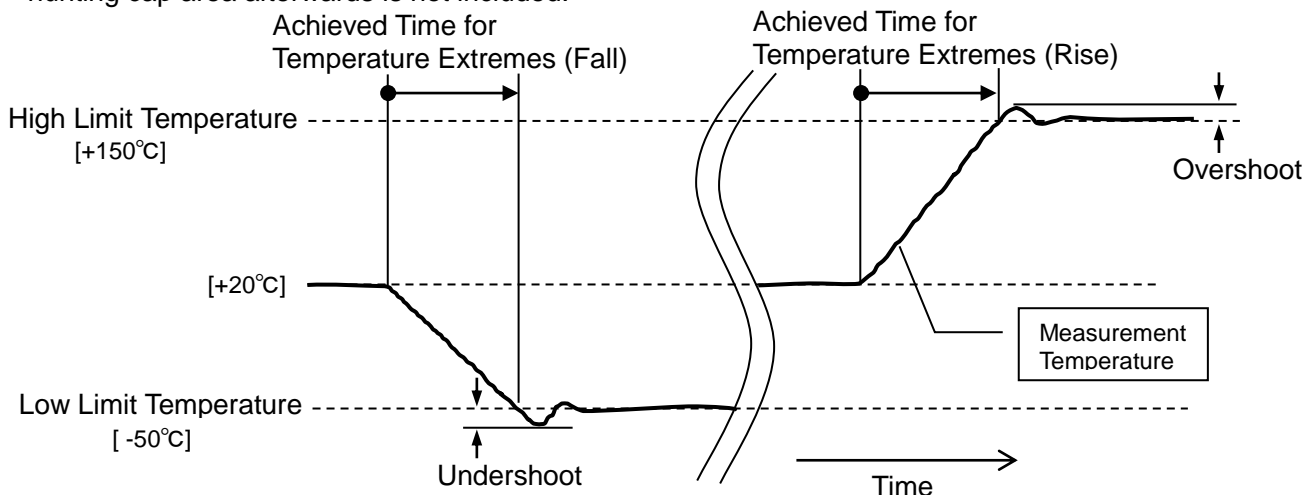
( II ) The detection points of the temperature uniformity are total 9 points.

(Center and every corner of chamber).

Measurement point (total 2 points)	-50°C, +150°C
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3. It is likely to grow by the temperature change of the overshoot and undershoot (Refer to the figure below) after a set temperature reaches fast, and to become about 8deg in the maximum.

The temperature rise time and the temperature drop time (Refer to the figure below) are assumed to be time until a set temperature is passed respectively. The overshoot and undershoot, or the temperature hunting cap area afterwards is not included.



During increasing and decreasing the temperature, the gradient is a little fluctuated on starting and stopping the cooler. (about 5°C)

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4. Please prepare the following parts by the customer.

- \*4.1 : Power source····· Power supply cable and Ground cable are not attached.
- \*4.2 : Cooling water (for water cooled condenser)
- \*4.3 : Drain piping

5. Maximum load current indicates the value at ambient temperature of 23°C and power supply voltage of 380V.

6. The unit and examination room dimension does not include the unit projections.

7. The shelf rest assumes it one set in two, and it is said that it is for 10 kg with one set.

8. The continuous drive time of the low temperature(-50°C or less) is 24 hours or less.

9. Sample temperature control and ramp control is effective in case of temperature cycle mode.

Ramp rate cannot be controlled at set value, in the case of sample condition. (Material, mass, other)  
Temperature fluctuations become large in case of sample temperature control, in the case of sample condition.

10. Sensor for sample temperature is not attached.

11. Requirements specification

1) Sample : 4 x Desktop PC(Weight: total 40kg) or 3 x Server Computer(Weight: total 60kg)

2) Test Condition ①: High temp. 85°C, Low temp. -40°C , Dwell time 23min (High temp. and Low temp. )

- Ramp rate : 16.6~27.7°C/min ( Temp. range : -38°C~83°C , Average rate)
- The following air temperature thermocouple will meet the leading air temperature thermocouple within 3.0 minutes of reaching the target air temperature.
- Hold time : 23±3min ( High temp. range : 83~87°C , Low temp. range : -38~-42°C)
- Overshoot and undershoot temp. : 5 deg or less ( Maximum temp. : 90°C , Minimum temp. : -45°C)  
Overshoot and undershoot time : within 3 minutes  
(reaching the High temp. range and Low temp. range)
- Humidity at high-temp. testing : 10%RH or less

3) Test Condition ②: High temp. 65°C, Low temp. -20°C , Dwell time 23min (High temp. and Low temp. )

- Ramp rate : 15.0~27.7°C/min ( Temp. range : -18°C~63°C , Average rate)
- The following air temperature thermocouple will meet the leading air temperature thermocouple within 2.5 minutes of reaching the target air temperature.
- Hold time : 23±3min ( High temp. range : 63~67°C , Low temp. range : -18~-22°C)
- Overshoot and undershoot temp. : 5 deg or less ( Maximum temp. : 70°C , Minimum temp. : -25°C)  
Overshoot and undershoot time : within 3 minutes  
(reaching the High temp. range and Low temp. range)
- Humidity at high-temp. testing : 10%RH or less

4) Temperature monitor points : Air temperature of within 5cm from the sample surface.

However, note that the following conditions.

- Set mode : 『Hi-speed』 (Program mode)
- Ambient temperature and humidity : 28°C/60%RH or less
- Cooling-water inlet temperature : 32°C or less
- Power source voltage : nominal voltage ±5% within

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