

NEW CONTROLLER

HAKKO HOT AIR GENERATOR

2000 SERIES · 3000 SERIES · 4000 SERIES · 6000 SERIES · 100V HOT AIR GENERATOR

NEW CONTROLLER

with RS-485 serial interface for PLC sequencing



SAFE & SMART

Safe and smart design
with the heater and
blower completely
covered

2000 SERIES



HAP2403H

3000 SERIES



4000 SERIES



6000 SERIES



100V HOT AIR GENERATOR



HAKKO ELECTRIC CO., LTD.

www.hakko.co.jp

APPLICATIONS

COMBINE VARIOUS OPTIONAL PARTS FOR ANY USAGE AS YOU PLEASE!

- Warming, heating, drying or browning in industrial oven.
- Moisture removal or drying after washing.
- Drying or hardening of adhesive used in electronic components.
- Preheat or drying of painted/coated parts.
- Heating, sterilization or defrosting of food equipment.

MAX 350°C



Energy savings with recirculation system

● Heat treatment for electronic circuit board

● Shrinking of cap seal

● Large disposal equipment for food waste

● Post-vulcanization of rubber molded parts

● Heating for chocolate surface softening

● Engine preheating for air rescue

● Hopper drying

● Seedbed drying

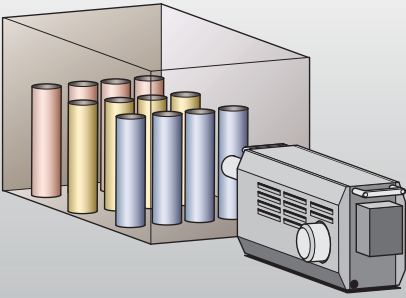
● Centrifuge type hot air dryer

● Meat or fish drying

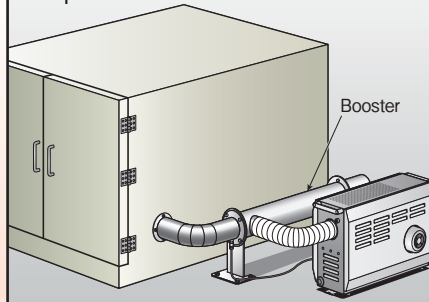
● Condensation removal of conveyor

● Compost fermentation tank

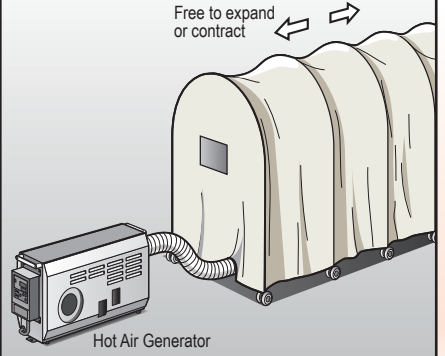
● Heating of plastic molded parts



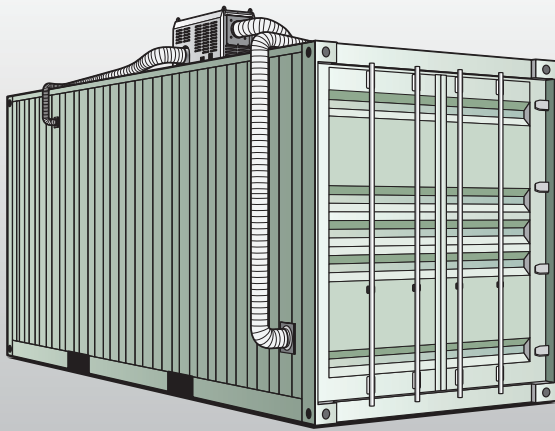
● Booster
To further increase the hot air temperature



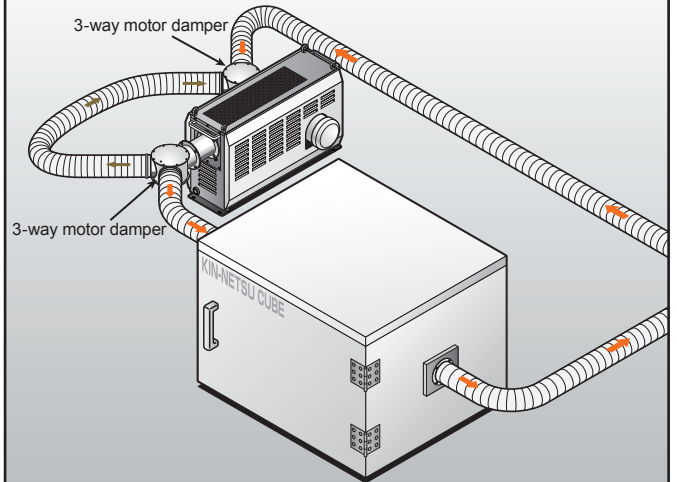
● Bellow type heating tent



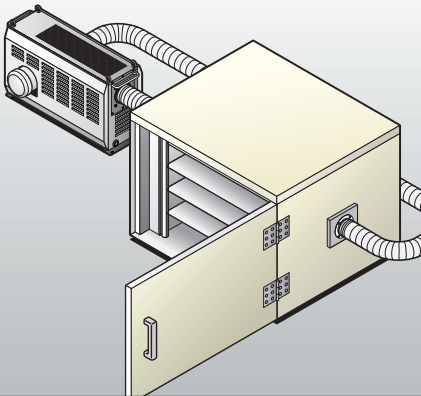
● Drying container application



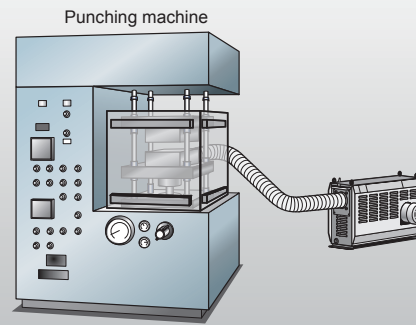
● 3-way motor damper example of usage



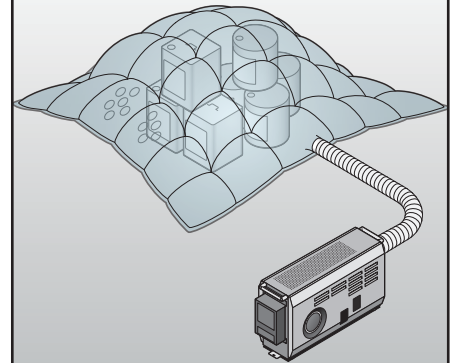
● Multi compartment drying cabinet



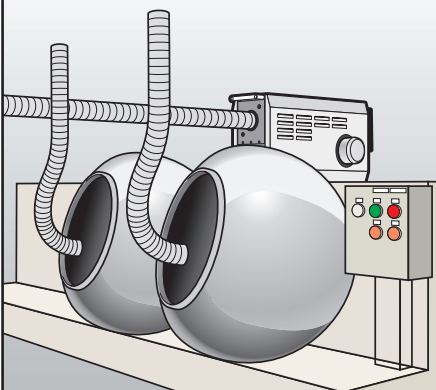
● Preheating of metal punching dies



● Warming of detergent, oil etc



● Heat for chocolate coating finish.

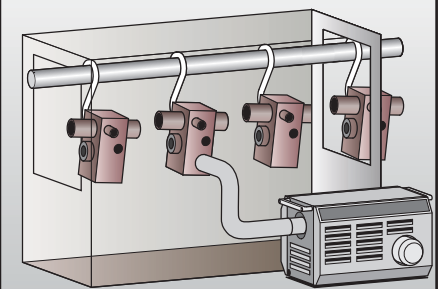


● Heat source for simple drying room



※ Please consult nearest fire authorities before installation

● Drying after washing with water



FEATURES OF HAKKO HOT AIR GENERATOR

- Clean and durable with the use of stainless steel sheathed heater.
- Compact and light weighted.
- High safety standards
- Main body and controller are separable, easy to be built into other devices.
- Robust design

Hot Air Generator's sheathed heater



DIFFERENCE BETWEEN METAL SHEATHED HEATERS AND OPEN COIL

	Sheathed heaters	Open coil
Structure	<p>Stainless steel sheath Insulation material (Magnesia) Heating element</p>	<p>Heating element</p>
Life span	Heating element is protected by the metal sheath, ensuring a longer heater life regardless of the atmosphere.	Heating element is in contact with the atmosphere, which may contain corrosive gas, dust or other factors that could reduce heater life.
Heating capabilities	Heating capabilities is minimally affected even after long hours of usage.	Heating capabilities will be reduced due to heating element corrosion when in contact with the atmosphere.
Insulation	Insulated between metal sheath and heating element.	Requires insulation using ceramic or other insulators.
Safety	No need to worry about power leakage because heating element is not exposed.	Power leakage might occur if in contact with water.

Renewal

CONTROLLER RENEWAL

IMPROVED FEATURES, BUILT-IN STANDARD FUNCTIONS SUCH AS PROGRAMMED OPERATION FUNCTIONS AND SERIAL COMMUNICATION

(All models of HAP2000/3000/6000 series and 100V Hot Air Generator share the same features)

- **Built-in standard functions for simple programmed operation**
Simple 1 pattern 8 step programmed operation made possible. Various types of events, temperature settings or blower frequency settings can be set in every step. (Frequency settings is only applicable for models with inverter)
- **Built-in standard functions for serial communication**
Built-in RS-485 (Modbus RTU / ASCII) feature facilitates centralized management with upper level control devices.
- **Added input terminals for external temperature sensor (sensor 2)**
The following controls are possible.
 - **Temperature control using external temperature sensor**
Hot Air Generator temperature control using external thermocouple installed inside industrial oven or near the object to be heated.
 - **Overheating error monitoring using external thermocouple**
Stops the heater when overheating occurs.
 - **Two-point temperature control using internal and external thermocouple**
Temperature control using one thermocouple, while another thermocouple is use for switching to blower operation when a set temperature is exceeded. When the temperature drops, the heater will be turned on again and hot air operation will start.
- **Start/stop operation using external control**
Facilitates automation of production line by enabling operation control using upper level control devices.
- **Output signals for various errors**
Facilitates centralized management by enabling error monitoring using upper level control devices.
- **Enables Hot Air Generator temperature control using external temperature controller's control signal**
Temperature controller in which the user is familiar with can be used. If the controller is capable of programmed operation, programmed temperature control will be possible.
- **Added delay timer function**
When hot air operation stops, cooling of the heater will automatically start.
- **Improved safety function**
When overheating occurs, the heater will be turned off by the Hot Air Generator's built-in safety mechanism even when the controller is malfunctioning.

HAKKO HOT AIR GENERATOR DEMO UNIT LENDING SERVICE

**"Demo unit" for almost all models*¹ are available.
Please use it for testing before purchase.**

*1 : Old models may apply depending on the model of interest.

**Request for "Demo unit lending service"
on the "Communication Sheet" page from
Hakko Electric's homepage.**



**Enter the relevant information, model of
interest and desired period.**



**Our sales person will contact you with
the details such as the period of lending.**



**Delivery of the demo unit.
Please return after use.**



- Maximum lending period is 14 days. Shipping cost will be charged to the customer.
- Lending service is only applicable for the Hot Air Generator. Purchase of ducts or other optional parts for testing may be required. Please contact our sales office for more information.

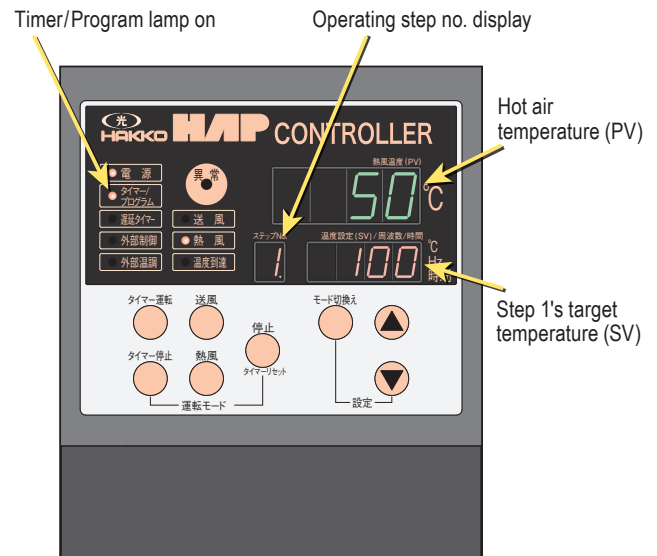
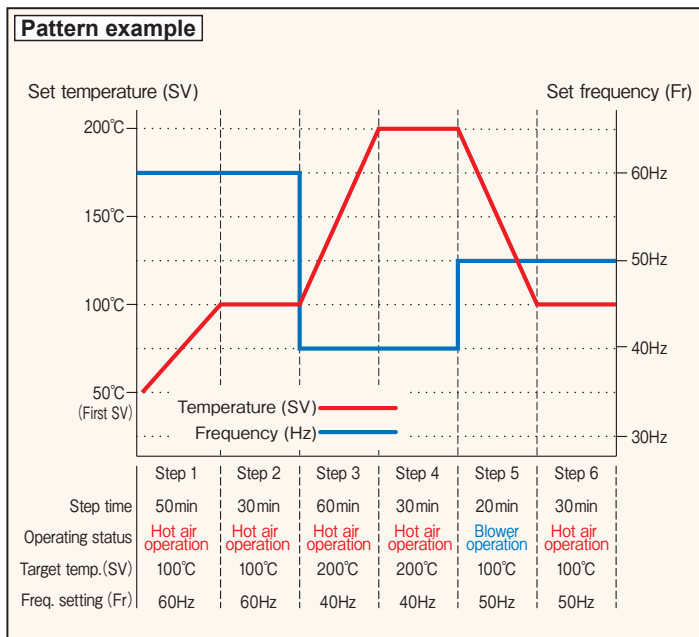


CONTROLLER RENEWAL! STANDARD BUILT-IN FEATURES FOR PROGRAMMED OPERATION AND SERIAL COMMUNICATION

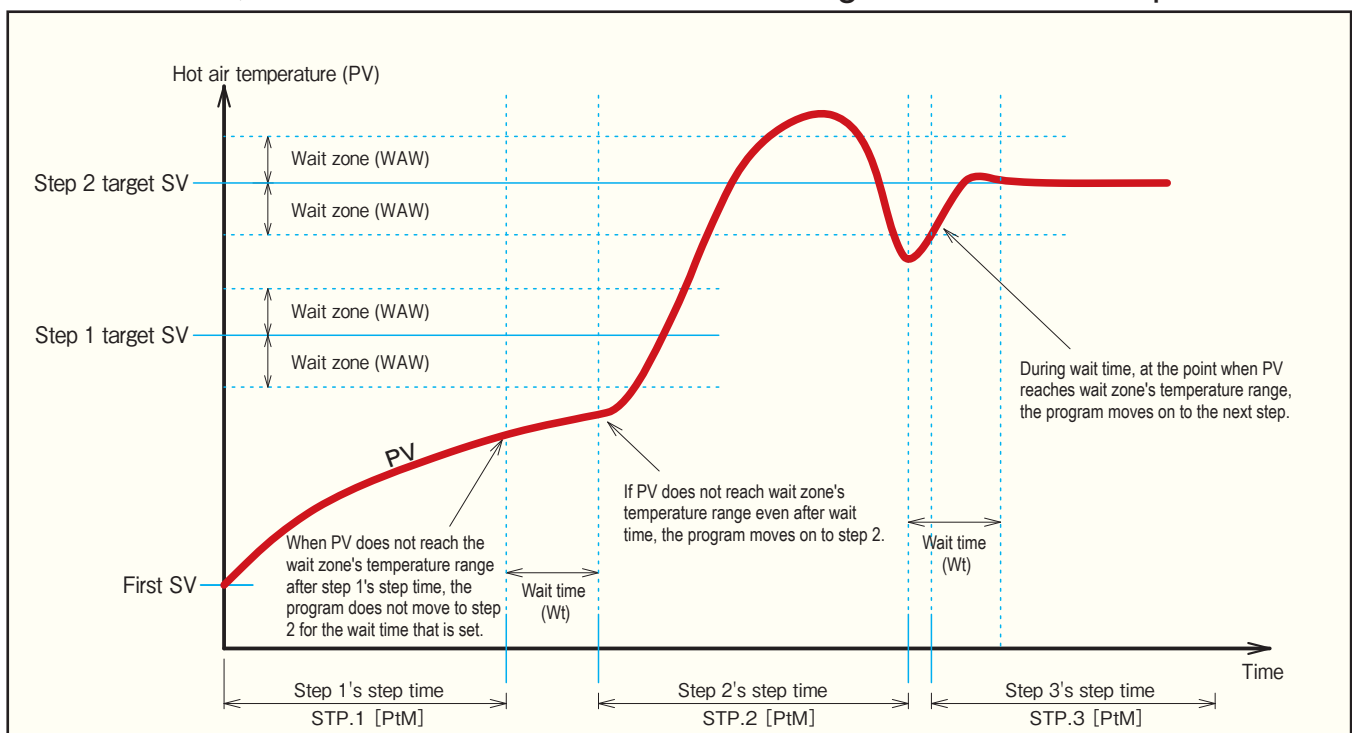
(HAP4000 series are excluded)

PROGRAMMED OPERATION FEATURE

- 1 pattern 8 step simple programmed operation is made possible
- Hot air, blower or stop operation can be selected in every step.
- Temperature and frequency of blower can be set for every step.
- Built-in wait function*



* If hot air temperature (PV) does not reach target temperature (SV) when step time is over, a wait time can be set before moving on to the next step.



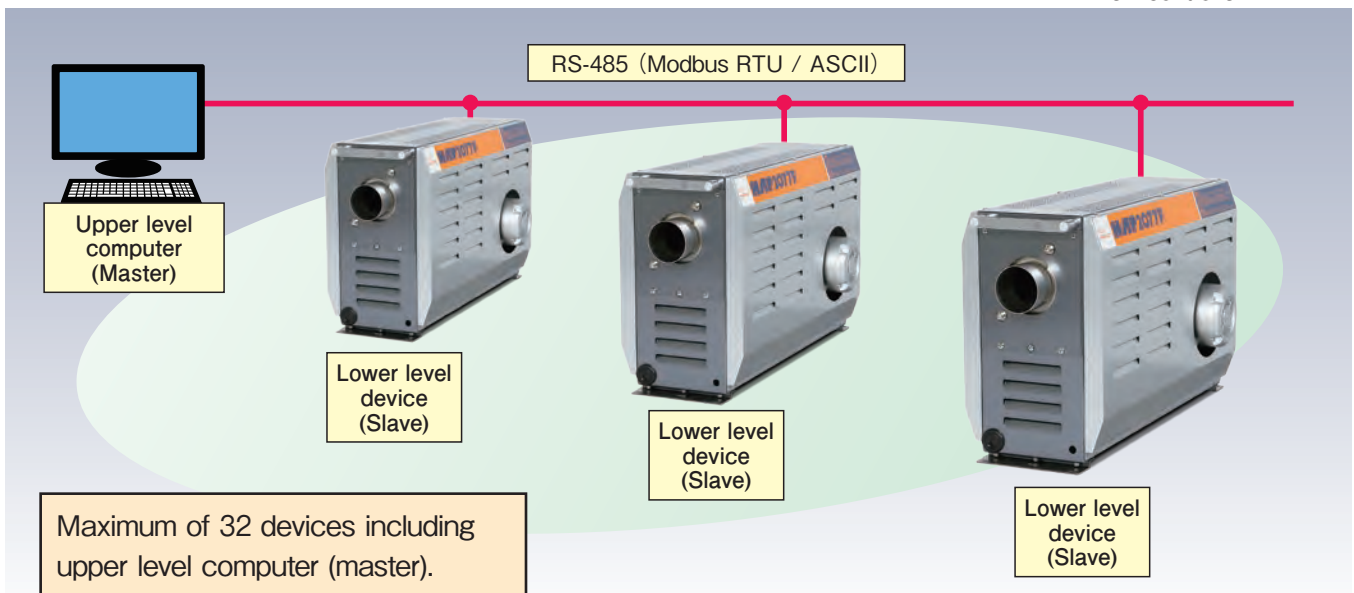
SERIAL COMMUNICATION WITH RS-485

SERIAL COMMUNICATION ENABLES OPERATION MANAGEMENT USING PLC, UPPER LEVEL COMPUTERS etc.

- Remote control for hot air/blower/stop/timer operation
- Error monitoring for temperature and operation status
- Parameter settings and monitoring



New controller



SERIAL COMMUNICATION SPECIFICATIONS

Interface	RS-485 (2 wire half-duplex)
Protocol	Modbus RTU / Modbus ASCII
Baud rate	4800 / 9600 / 19200 / 38400 bps
Data bits	7 / 8 bit
Stop bits	1 / 2 bit
Parity check	None / Even / Odd
Read timeout	0 ~ 250ms
Terminating resistor	120Ω Enabled when terminating resistor terminal 1 and 2 are shorted on the communication terminal block.

NEW CONTROLLER

All models of HAP2000/3000/6000 series and 100V Hot Air Generator share the same features

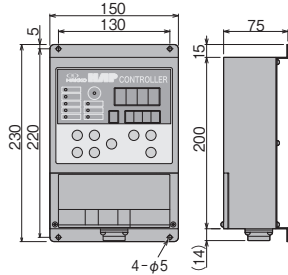
RENEWAL

IMPROVED FEATURES, BUILT-IN STANDARD FUNCTIONS SUCH AS PROGRAMMED OPERATION FUNCTIONS AND SERIAL COMMUNICATION

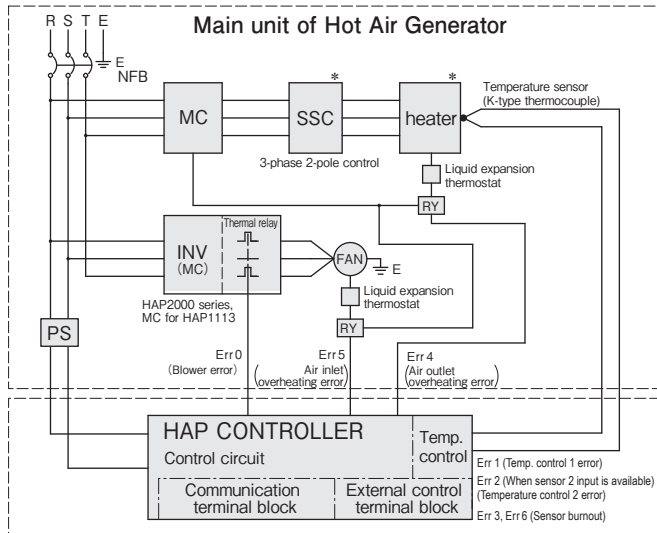


MODEL CHANGE

● DIMENSIONAL DRAWING



● CIRCUIT DIAGRAM



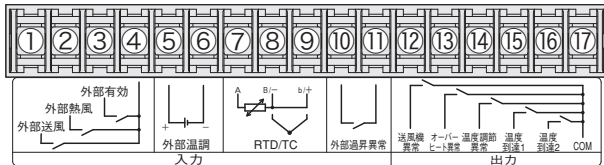
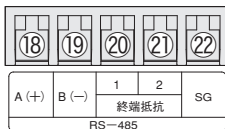
* : 2 SSC and heater circuits for HAP2601(F) and HAP2801(F).

● EXTERNAL CONTROL TERMINAL BLOCK

Screw size : M3

Recommended crimping terminal :

R1.25-3 (JIS C 2805)



- ① **Blower external control input terminal**
Hot air operation is performed by inputting a dry contact signal externally.
- ② **Hot air external control input terminal**
Hot air operation is performed by inputting a dry contact signal externally.
- ③ **External control enable input terminal**
External control operation is enabled by inputting a dry contact signal externally.
- ④ **Externally controlled blower / hot air COM**
- ⑤⑥ **External temperature control input (+, -)**
Temperature control is performed externally by inputting SSR signal from an external temperature controller.
- ⑦⑧⑨ **RTD / TC input (external temperature sensor)**
When you input the external temperature sensor (sensor 2), the temperature is controlled by the external temperature sensor. K-type thermocouple (grounded or non-grounded type) or 3-wire RTD

Operation keys

Stop key	Stops the operation. If pressed while running hot air operation, the delay timer countdown starts (1min) and blower operations runs. After the countdown the blower will stop.
Blower key	Only runs the blower (blower operation).
Hot air key	Runs the heater and the blower (hot air operation).
Timer operation key	After timer set time, hot air operation will run (timer operation mode) *1
Timer stop key	After timer set time, the heater is turned off and blower operation runs for 1min before complete stop (timer stop mode) *1
Mode switching key	Switching in sequence between operation screen (=temperature setting), frequency setting (only applicable for models with inverter), timer setting, etc.
△ key / ▽ key	Change set value.

Indicator lamp

Power	Lights up when Hot Air Generator circuit breaker is switched on.
Timer / program	Blinks when timer is counting in timer operation or timer stop mode. Lights up when the programmed operation mode is enabled.
Delay timer	Blinks when delay timer is counting *2
External temperature control	Lights up when external temperature control mode is enabled *3
Blower	Lights up during blower operation.
Hot air	Lights up during hot air operation.
External control	Lights up when external control mode is enabled *3

- *1 Timer setting range is 0day 00hr 00min ~ 9days 23hrs 59mins
- *2 Pressing the blower key or stop key during hot air operation will start the delay timer countdown in which blower operation will run during the countdown. Blower operation will continue to run after the countdown for the case where blower key is pressed, while it will stop for the case where stop key is pressed.
- *3 Please refer to the instructions manual for more details.

Others

Temperature control method	PID control
Main unit weight	1.3 kg

● Optional cable for connecting main unit and controller



In stock	Model no.	Product code	Length	Weight
◎	ZAA2103	00013282	3m	0.9kg
◎	ZAA2105	00013283	5m	1.3kg
◎	ZAA2110	00013284	10m	2.3kg

- ⑩⑪ **External overheating error input terminal**
When the overheat prevention switch closes (contact signal when an error occurs), the external temperature overheating will be detected and the hot air generator will be stopped when an overheating error occurs.
- ⑫ **Blower error output terminal**
When an error occurs in the blower, the contact output turns "ON".
- ⑬ **Overheat output terminal**
When the temperature sensor built into the hot air generator body detects an overheating error or when an external overheating error occurs (⑩⑪ when the external overheating error input is "ON"), the contact output turns "ON".
- ⑭ **Temperature control error output terminal**
When the thermocouple which is attached to the hot air generator body (sensor 1) or external temperature sensor (sensor 2) detects temperature control error, the contact output turns "ON".
- ⑮ **Temperature Reached Signal output terminal 1**
Turns "On" when there is a Temperature Reached Signal, which depends on the temperature of the thermocouple (sensor 1) located at the air outlet.
- ⑯ **Temperature Reached Signal output terminal 2**
Turns "On" when there is a Temperature Reached Signal, which depends on the external temperaturesensor(sensor 2).
- ⑰ ⑫ to ⑱ **Output COM**
- ⑲⑳ **RS-485 communication terminal (A(+), B(-))**
Connect the wiring for RS-485 communication. Use a shielded twisted pair cable for wiring.
- ㉑ **RS-485 communication terminating resistor**
The terminating resistor (120Ω) is enabled by short-circuiting ⑳ and ㉑. Short-circuit the controller that is the final end of communication to enable it.
- ㉒ **SG (RS-485 signal ground)**
Please connect if necessary.

HAKKO HOT AIR GENERATOR Lineup of products is further extended

HAP2000F SERIES P9

Standard equipped with inverter and temperature controller.



HAP2000 SERIES P11

Standard equipped with temperature controller. Easy temperature settings.



HAS2000 SERIES P15

w/o Controller and other electrical parts for other machinery built-in applications.



HAP2000T SERIES P13

High airflow and static pressure



HAP4000 SERIES P21

Compact design for easy transport. Temperature controller built-in type.



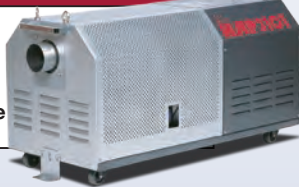
HAS4000 SERIES P23

w/o Controller and other electrical parts for other machinery built-in applications.



HAP3000 SERIES P19

Hot Air Generator with high static pressure using vortex flow type fan blower.



HAP6000 SERIES P20

High temperature type that enables high temperature air recirculation.

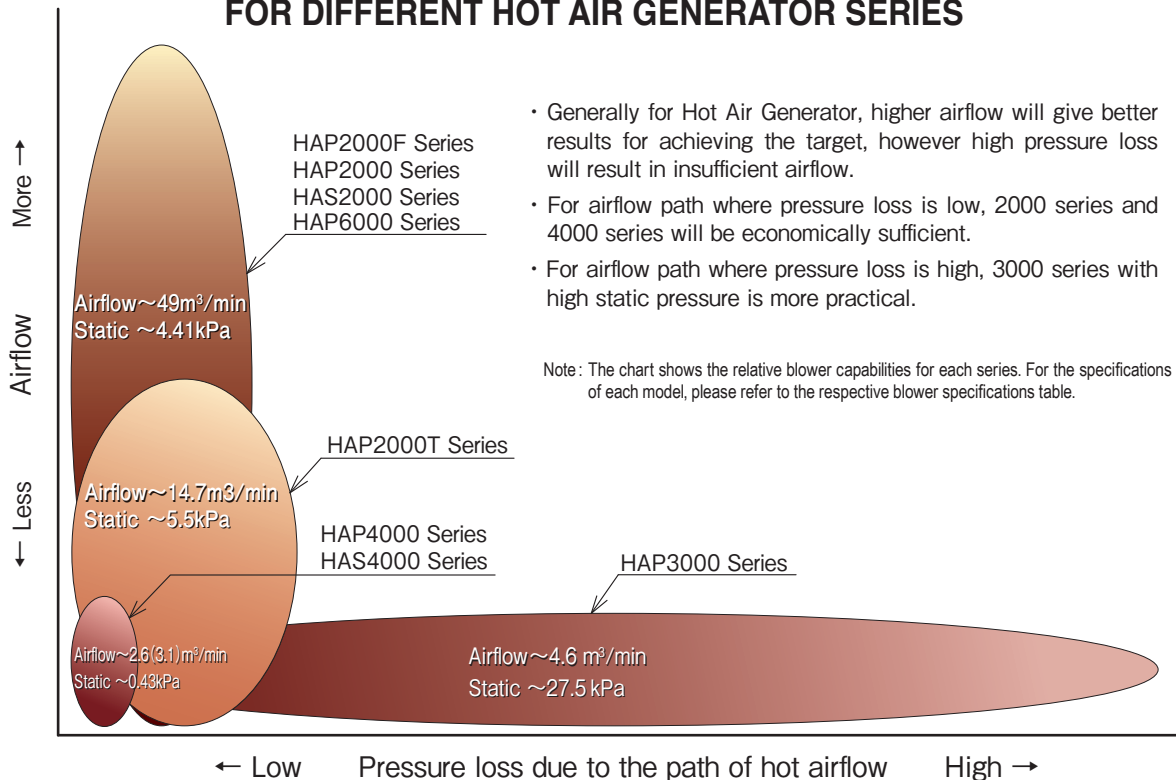


100V HOT AIR GENERATOR P26

Operate with 100V power supply, can be use for recirculation system.



BLOWER CAPABILITY COMPARISON CHART FOR DIFFERENT HOT AIR GENERATOR SERIES



- Generally for Hot Air Generator, higher airflow will give better results for achieving the target, however high pressure loss will result in insufficient airflow.
- For airflow path where pressure loss is low, 2000 series and 4000 series will be economically sufficient.
- For airflow path where pressure loss is high, 3000 series with high static pressure is more practical.

Note: The chart shows the relative blower capabilities for each series. For the specifications of each model, please refer to the respective blower specifications table.

HOT AIR GENERATOR PRECAUTIONS FOR USE

- Use of power supply voltage other than specified may result in fire or electrical shock.
- Do not modify.
- Never use in atmosphere with combustible or flammable gas.
- Pieces of cloth, paper or other foreign objects are easy drawn into the air inlet, please be cautious.

100V HOT AIR GENERATOR

Can be used for hot air recirculation system up to 230°C

■ HAP1113 (100V 1.2kW)



IMPROVED CONTROLLER
FUNCTIONS

**MODEL
CHANGE**



Demo unit lending or maintenance services
can be requested on our homepage.
www.hakko.co.jp

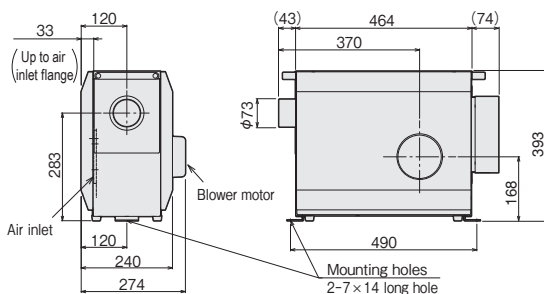
FEATURES

- Equipped with new controller.
- Since it uses stainless steel sheathed heater, it is clean and has excellent durability.
- High safety standards.
- Supports recirculation system for intake air temperature of up to 230°C. Capable of temperature control of up to 300°C.
- Main body and controller are separable, easy to be built into other devices.

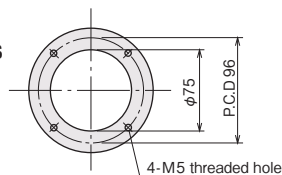
APPLICATIONS

- Warming, heating or drying in industrial oven.
- Moisture removal or drying after wash.
- Drying or hardening of adhesive used in electronic components.
- Drying of water-based paint.
- Preheat or drying of painted/coated parts.
- Heating or sterilization of food equipment.

DIMENSIONS & SPECIFICATIONS



Air inlet dimensions



Casing material : Steel plate (coated)

In stock	◎	
Model NO.	HAP1113	
Product code	00070005	
Power supply	100V (50/60Hz)	
Total power rating	1.4kW	
Heater power rating	1.2kW	
Air outlet air temperature range	R.T. ~ 300°C*1	
Temperature control method	PID control (SSR drive)	
Airflow (50/60Hz) Reference value	4.0 / 4.7 m ³ /min (Air damper fully opened) 2.8 / 3.3 m ³ /min (Air damper half opened) 0.4 / 0.5 m ³ /min (Air damper fully closed)	
Airflow control	Adjustable air damper	
Diameter of air inlet	φ75mm (Adjustable air damper attached)	
Diameter of air outlet	φ73mm Stainless steel pipe	
Suction air temperature range	-10 ~ 230°C	
Blower specifications	Max airflow (50/60Hz)	5.2 / 6.2 m ³ /min
	Max static pressure (50/60Hz)	0.63 / 0.89 kPa
	Blower power rating	0.15 kW
	Noise at max. airflow (50/60Hz)*2	70 / 74 dB
Power cable	Cable cable 2PNCT 3core x 1.25 mm ² x 3m 2P+E plug attached	
Weight	25kg	
Operating environment	Ambient temperature : 0 ~ 40°C Relative humidity : Below 80% RH (Provided that no condensation occurs)	

*1 : Air temperature varies depending on usage conditions. Please use it below the maximum temperature. (Refer page 29)

*2 : This is the value of the blower alone. The actual noise varies greatly depending on the conditions.

HOT AIR GENERATOR 2000 SERIES

Separable controller, utilizes metal sheathed heater

IMPROVED CONTROLLER
FUNCTIONS

**MODEL
CHANGE**



FEATURES

- Equipped with new controller.
- Since it uses stainless steel sheathed heater, it is clean and has excellent durability.
- Compact and light weighted.
- High safety standards.
- Main body and controller are separable, easy to be built into other devices.
- Robust design.

PRECAUTIONS FOR USE

- Use of power supply voltage other than specified may result in fire or other hazards.
- Do not modify.
- Never use in atmosphere with combustible or flammable gas.
- Pieces of cloth, paper or other foreign objects are easy drawn into the air inlet, please be cautious.

APPLICATIONS

- Warming, heating, drying or browning in industrial oven.
- Moisture removal or drying after wash.
- Drying or hardening of adhesive used in electronic components.
- Preheat or drying of painted/coated parts.
- Heating, sterilization or defrosting of food equipment.



**Air inlet on the
opposite side can
be manufactured**

BUILT TO ORDER

(Excluding HAP2000T series)

**Demo unit lending or maintenance services can be
requested on our homepage.**

www.hakko.co.jp

**BUILD-TO-ORDER
ITEMS THAT
SUPPORT
DIFFERENT POWER
SUPPLY CAN BE
MANUFACTURED.**

Supported models, power supply voltage and frequency

Series	Model type	Power supply voltage			Frequency
HAP2000 HAS2000 Series	For models up to 40kW (Including 2000T series)	3P 220V, 3P 380V, 3P 440V,	3P 230V, 3P 400V, 3P 460V,	3P 240V 3P 415V 3P 480V	50/60Hz

Please refer to page 19 for details on "How to order Hot Air Generator 2000 series with different power supply"

HAP2000F SERIES

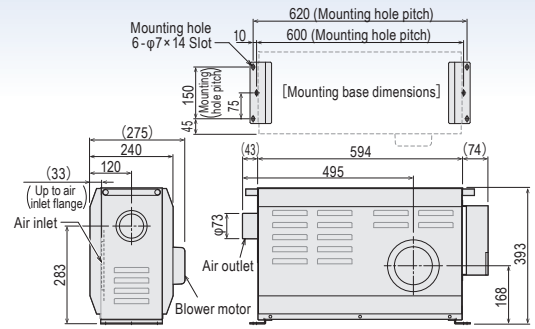
Standard equipped with controller and inverter

Casing material: Steel plate (coated)

HAP2032F / HAP2052F / HAP2077F (3P 200V 3kW / 5kW / 7.5kW)



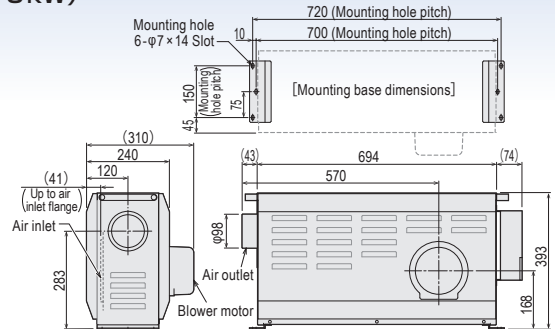
NEW



HAP2082F / HAP2102F (3P 200V 8kW / 10kW)



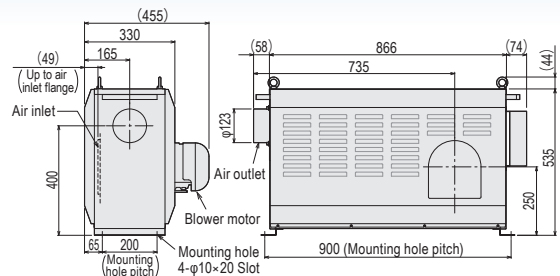
NEW



HAP2152HF / HAP2202HF (3P 200V 15kW / 20kW)



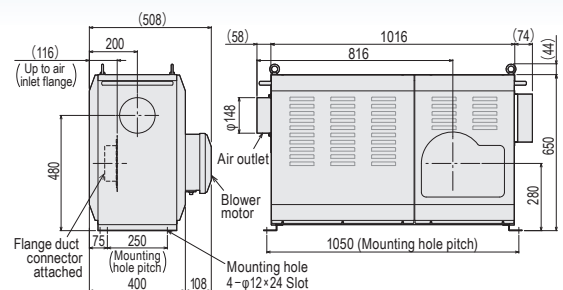
NEW



HAP2302HF / HAP2403HF (3P 200V 30kW / 40kW)



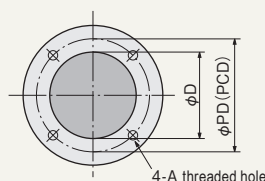
NEW



Air inlet



Air inlet dimensions



Model No.	φ D	φ PD	A
HAP2032F · 2052F · 2077F	75	96	M5
HAP2082F · 2102F	100	120	
HAP2152HF · 2202HF	125	140	
HAP2302HF · 2403HF	150	180	M8
HAP2601F · 2801F	200	240	

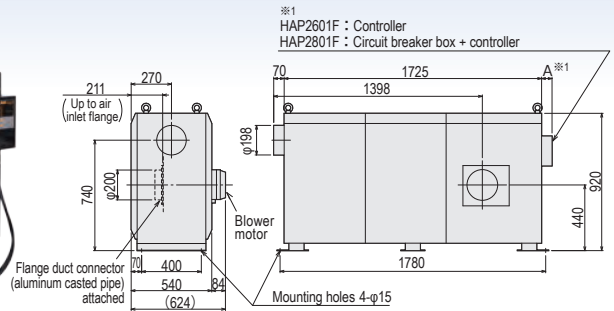
Air inlet for all model are positioned at the direct opposite of the blower motor.

Standard equipped with inverter.

Airflow is adjustable by setting the frequency on the controller.

Casing material: Steel plate (coated)

HAP2601F / HAP2801F (3P 200V 60kW / 80kW)



※1: With the controller attached to HAP2601F, the dimension of A is 75mm.
For HAP2801F, a circuit breaker box is attached and the controller is attached to the box.
When the controller is attached to the front side of the circuit breaker box, A is 255mm. If the controller is attached to the side of the box, A is 179mm (223mm if breaker switch is included).

HAP2000F SERIES

Build-to-order items that support different power supply can be manufactured (refer page 19).

In stock	◎	◎	◎	◎	◎
Model No.	HAP2032F	HAP2052F	HAP2077F	HAP2082F	HAP2102F
Product code	00013250	00013251	00013252	00013253	00013254
Power supply	3P 200V (50/60Hz)				
Total power rating	3.2 kW	5.2 kW	7.7 kW	8.3 kW	10.3 kW
Heater power rating	3 kW	5 kW	7.5 kW	8 kW	10 kW
Air outlet air temperature range	R.T. ~ 350°C*2				
Temperature control	PID control (SSR drive)				
Airflow control (30~60Hz)	2.3 m ³ /min ~ 4.8 m ³ /min			3.7 m ³ /min ~ 7.8 m ³ /min	
Airflow control	Adjustable suction airflow by changing the blower rotation speed with the inverter				
Inverter output frequency setting range	30 ~ 60Hz				
Diameter of air inlet	φ 75 mm Hole			φ 100 mm Hole	
Diameter of air outlet	φ 73 mm Stainless steel pipe			φ 98 mm Stainless steel pipe	
Suction air temperature range	- 10 ~ 230 °C				
Blower specifications	Max airflow (60Hz)	6.2 m ³ /min			10.4 m ³ /min
	Maximum static pressure (60Hz)	0.91 kPa			1.35 kPa
	Blower power rating	3P 200V 0.15 kW			3P 200V 0.3 kW
	Noise at max. airflow (60Hz) *3	74 dB			78 dB
Power cable	2PNCT 4core × 2mm ² × 3 m		2PNCT 4core × 3.5mm ² × 3 m		2PNCT 4core × 5.5mm ² × 3 m
Weight	30 kg			37 kg	38 kg
Operating environment	Ambient temperature : 0 ~ 40°C		Relative humidity : Below 80% RH (Provided that no condensation occurs)		

In stock	◎*1	◎*1	◎*1	◎*1			
Model No.	HAP2152HF	HAP2202HF	HAP2302HF	HAP2403HF	HAP2601F	HAP2801F	
Product code	00013255	00013256	00013257	00013258	00013290	00013293	
Power supply	3P 200V (50/60Hz)						
Total power rating	16.5 kW	21.5 kW	31.5 kW	41.5 kW	63.7 kW	83.7 kW	
Heater power rating	15 kW	20 kW	30 kW	40 kW	60 kW	80 kW	
Air outlet air temperature range	R.T. ~ 350°C*2						
Temperature control	PID control (SSR drive)						
Airflow control (30~60Hz)	8.8 ~ 17.5 m ³ /min		14 ~ 27 m ³ /min		25 ~ 49 m ³ /min		
Airflow control	Adjustable suction airflow by changing the blower rotation speed with the inverter						
Inverter output frequency setting range	30 ~ 60Hz						
Diameter of air inlet	φ 125 mm Hole		φ 148 mm Pipe		φ 200 mm Aluminum casted pipe		
Diameter of air outlet	φ 123 mm Stainless steel pipe		φ 148 mm Stainless steel pipe		φ 198 mm Stainless steel pipe		
Suction air temperature range	- 10 ~ 230 °C						
Blower specifications	Max airflow (60Hz)	24.0 m ³ /min		34 m ³ /min		65 m ³ /min	
	Maximum static pressure (60Hz)	2.37 kPa		2.8 kPa		4.41 kPa	
	Blower power rating	3P 200V 1.5 kW				3P 200V 3.7 kW	
	Noise at max. airflow (60Hz) *3	90 dB		90 dB		92 dB	
Power cable	2PNCT 4core × 14mm ² × 3m	2PNCT 4core × 22mm ² × 3m	2PNCT 4core × 38mm ² × 3m		Refer table below for recommended cables*4		
Weight	74 kg	82 kg	125 kg	128 kg	265 kg	300 kg	
Operating environment	Ambient temperature : 0 ~ 40°C		Relative humidity : Below 80% RH (Provided that no condensation occurs)				

*1 : Shipment on the next day may not apply for some areas.

*2 : Air temperature varies depending on usage conditions. Please use it below the maximum temperature. (Refer page 28)

*3 : This is the value of the blower alone. The actual noise varies greatly depending on the conditions.

*4 : For customer use, please carry out wiring for upstream circuit breaker.

Recommended cables	HAP2601F	HAP2801F
Power cables	KIV100mm ² × 3 lines	KIV150mm ² × 3 lines
Earth cables	KIV 38mm ² × 1 lines	

No sign : [Build-to-order]

Please inquire for details on delivery dates

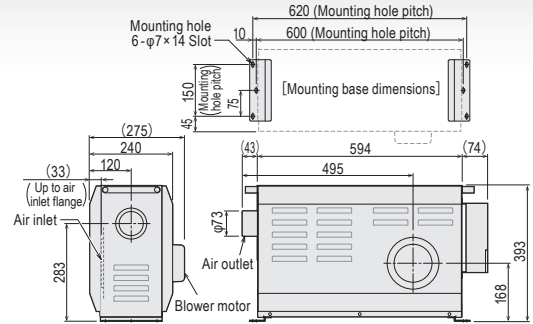
Please provide model no. and product code when placing order.

HAP2000 SERIES

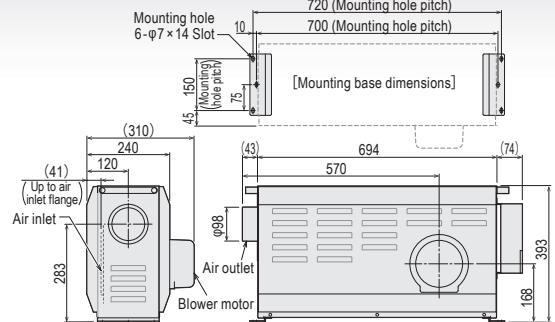
Standard equipped with controller

Casing material: Steel plate (coated)

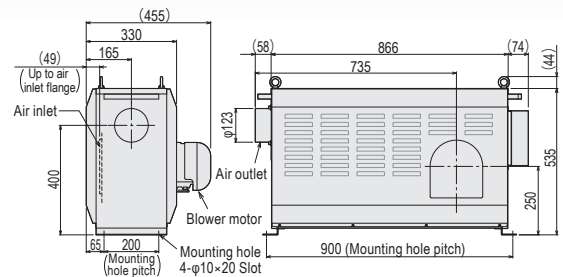
HAP2032 / HAP2052 / HAP2077 (3P 200V 3kW / 5kW / 7.5kW)



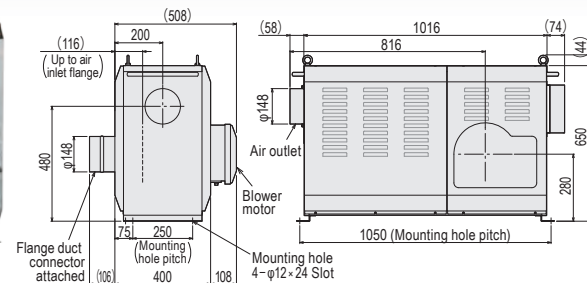
HAP2082 / HAP2102 (3P 200V 8kW / 10kW)



HAP2152H / HAP2202H (3P 200V 15kW / 20kW)



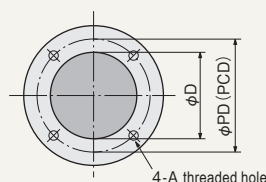
HAP2302H / HAP2403H (3P 200V 30kW / 40kW)



Air inlet



Air inlet dimensions



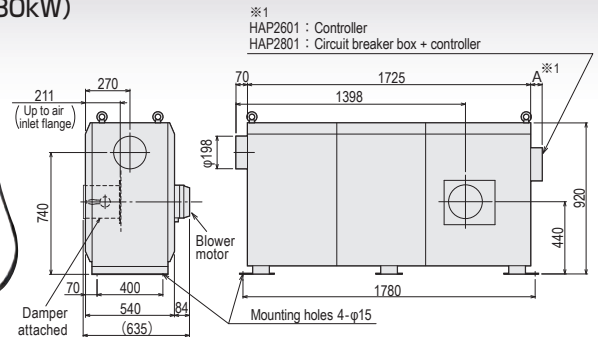
Model No.	φ D	φ PD	A
HAP2032 · 2052 · 2077	75	96	M5
HAP2082 · 2102	100	120	
HAP2152H · 2202H	125	140	
HAP2302H · 2403H	150	180	M8
HAP2601 · 2801	200	240	

Air inlet for all model are positioned at the direct opposite of the blower motor.
HAP2032~HAP2202H are attached with adjustable air damper(Damping rate: approximately 10~100%).
HAP2302H~HAP2801 are attached with flange damper.

Easy temperature controller with attached controller.
Main body and controller are separable, easy to be built into other devices.

Casing material: Steel plate (coated)

HAP2601 / HAP2801 (3P 200V 60kW / 80kW)



※1: With the controller attached to HAP2601, the dimension of A is 75mm.
For HAP2801, a circuit breaker box is attached and the controller is attached to the box.
When the controller is attached to the front side of the circuit breaker box, A is 255mm. If the controller is attached to the side of the box, A is 179mm (223mm if breaker switch is included).

HAP2000 SERIES

Build-to-order items that support different power supply can be manufactured (refer page 19).

In stock	◎	◎	◎	◎	◎
Model No.	HAP2032	HAP2052	HAP2077	HAP2082	HAP2102
Product code	00013241	00013242	00013243	00013244	00013245
Power supply	3P 200V (50/60Hz)				
Total power rating	3.2 kW	5.2 kW	7.7 kW	8.3 kW	10.3 kW
Heater power rating	3 kW	5 kW	7.5 kW	8 kW	10 kW
Air outlet air temperature range	R.T. ~ 350°C*2				
Temperature control	PID control (SSR drive)				
Air flow reference value (50/60Hz)	Damper fully opened Damper 2/3 opened Damper 1/3 opened	4.0 / 4.8 m ³ /min 3.2 / 3.8 m ³ /min 2.0 / 2.4 m ³ /min		6.7 / 7.8 m ³ /min 5.7 / 6.6 m ³ /min 3.6 / 4.3 m ³ /min	
Airflow control	Adjustable air damper				
Diameter of air inlet	φ 75 mm Hole (Adjustable air damper attached)			φ 100 mm Hole (Adjustable air damper attached)	
Diameter of air outlet	φ 73 mm Stainless steel pipe			φ 98 mm Stainless steel pipe	
Suction air temperature range	- 10 ~ 230°C				
Blower specifications	Max airflow (50/60Hz)	5.4 / 6.2 m ³ /min		8.8 / 10.4 m ³ /min	
	Max static pressure (50/60Hz)	0.63 / 0.91 kPa		0.95 / 1.35 kPa	
	Blower power rating	3P 200V 0.15 kW		3P 200V 0.3 kW	
	Noise at max. airflow (50/60Hz)*3	70 / 74 dB		75 / 78 dB	
Power cable	2PNCT 4core × 2mm ² × 3m		2PNCT 4core × 3.5mm ² × 3m		2PNCT 4core × 5.5mm ² × 3m
Weight	30 kg			37 kg	38 kg
Operating environment	Ambient temperature : 0 ~ 40°C Relative humidity : Below 80% RH (Provided that no condensation occurs)				

In stock	◎*1	◎*1	◎*1	◎*1		
Model No.	HAP2152H	HAP2202H	HAP2302H	HAP2403H	HAP2601	HAP2801
Product code	00013246	00013247	00013248	00013249	00013289	00013292
Power supply	3P 200V (50/60Hz)					
Total power rating	16.5 kW	21.5 kW	31.5 kW	41.5 kW	63.7 kW	83.7 kW
Heater power rating	15 kW	20 kW	30 kW	40 kW	60 kW	80 kW
Air outlet air temperature range	R.T. ~ 350°C*2					
Temperature control	PID control (SSR drive)					
Air flow reference value (50/60Hz)	Damper fully opened Damper 2/3 opened Damper 1/3 opened	15.0 / 17.5 m ³ /min 12.4 / 14.8 m ³ /min 7.5 / 9.1 m ³ /min		23 / 27 m ³ /min 17 / 21 m ³ /min 5.5 / 6.5 m ³ /min		41 / 47 m ³ /min 35 / 41 m ³ /min 14 / 16 m ³ /min
Airflow control	Adjustable air damper					
Diameter of air inlet	φ 125mm Hole (Adjustable air damper attached)		φ 148mm (Flange damper attached)		φ 198mm (Flange damper attached)	
Diameter of air outlet	φ 123mm Stainless steel pipe		φ 148mm Stainless steel pipe		φ 198mm Stainless steel pipe	
Suction air temperature range	- 10 ~ 230°C					
Blower specifications	Max airflow (50/60Hz)	20.8 / 24.0 m ³ /min		30 / 34 m ³ /min		54 / 65 m ³ /min
	Max static pressure (50/60Hz)	1.65 / 2.37 kPa		1.95 / 2.8 kPa		3.07 / 4.41 kPa
	Blower power rating	3P 200V 1.5 kW		3P 200V 1.5 kW		3P 200V 3.7 kW
	Noise at max. airflow (50/60Hz)*3	85 / 90 dB		87 / 90 dB		90 / 92 dB
Power cable	2PNCT 4core × 14mm ² × 3m	2PNCT 4core × 22mm ² × 3m	2PNCT 4core × 38mm ² × 3m		Refer table below for recommended cables*4	
Weight	74 kg	82 kg	125 kg	128 kg	265 kg	300 kg
Operating environment	Ambient temperature : 0 ~ 40°C Relative humidity : Below 80% RH (Provided that no condensation occurs)					

*1 : Shipment on the next day may not apply for some areas.

*2 : Air temperature varies depending on usage conditions. Please use it below the maximum temperature. (Refer page 28)

*3 : This is the value of the blower alone. The actual noise varies greatly depending on the conditions.

*4 : For customer use, please carry out wiring for upstream circuit breaker.

Recommended cables	HAP2601	HAP2801
Power cables	KIV 100mm ² × 3 lines	KIV 150mm ² × 3 lines
Earth cables	KIV 38mm ² × 1 lines	

No sign : [Build-to-order]

Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

HAP2000T SERIES

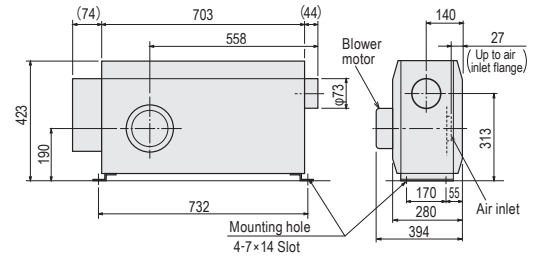
CONTROLLER EQUIPPED

Hot Air Generator with high airflow and pressure. Equipped with controller and inverter for easy temperature and airflow control. Controller is separable from the main unit.

Casing material: Steel plate (coated)

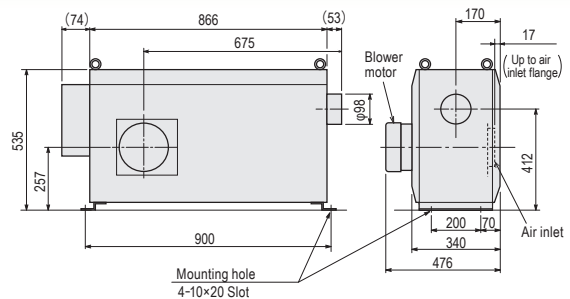
HAP2053T (3P 200V 5kW)

NEW



HAP2103T (3P 200V 10kW)

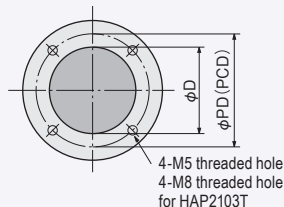
NEW



Air inlet



Air inlet dimensions



Model No.	φ D	φ PD
HAP2053T	120	140
HAP2103T	150	180

Air inlet for all model are positioned at the direct opposite of the blower motor.

HAP2000T SERIES

Build-to-order items that support different power supply can be manufactured (refer page 19).

In stock		
Model No.	HAP2053T	HAP2103T
Product code	00013295	00013296
Power supply	3P 200V (50/60Hz)	
Total power rating	5.4 kW	11.5 kW
Heater power rating	5 kW	10 kW
Air outlet air temperature range	R.T. ~ 350°C *	
Temperature control	PID control (SSR drive)	
Airflow control (30~60Hz)	3.2 ~ 6.5 m ³ /min	7.2 ~ 14.7 m ³ /min
Airflow control	Adjustable suction airflow by changing the blower rotation speed with the inverter	
Inverter output frequency setting range	30~60 Hz	
Diameter of air inlet	φ120mm Hole	φ150mm Hole
Diameter of air outlet	φ73mm Stainless steel pipe	φ98mm Stainless steel pipe
Suction air temperature range	-10 ~ 150°C	
Blower specifications	Max airflow (60Hz)	9.4 m ³ /min
	Maximum static pressure (60Hz)	3.0 kPa
	Blower power rating	3P 200V 0.4 kW
	Noise at max. airflow (60Hz) *3	81 dB
Power cable	2PNCT 4 core × 3.5mm ² × 3 m	2PNCT 4 core × 8mm ² × 3 m
Weight	43 kg	75 kg
Operating environment	Ambient temperature : 0 ~ 40°C Relative humidity : Below 80% RH (Provided that no condensation occurs)	

* Air temperature varies depending on usage conditions. Please use it below the maximum temperature. (Refer page 28)

HAS2000 SERIES

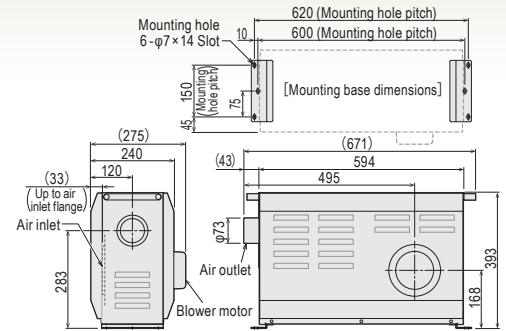
Type without controller

Casing material: Steel plate (coated)

HAS2032 / HAS2052 / HAS2077 (3P 200V 3kW / 5kW / 7.5kW)



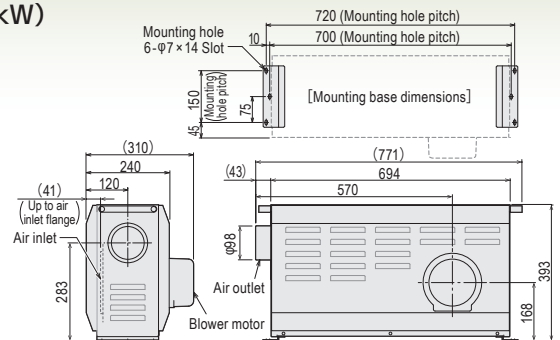
NEW



HAS2082 / HAS2102 (3P 200V 8kW / 10kW)



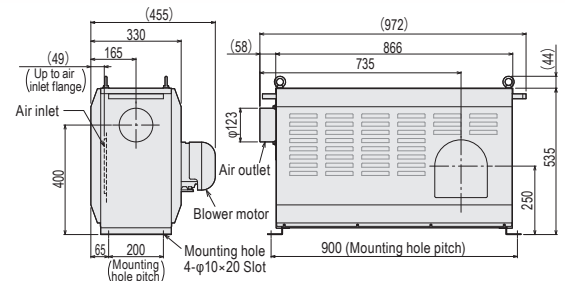
NEW



HAS2152H / HAS2202H (3P 200V 15kW / 20kW)



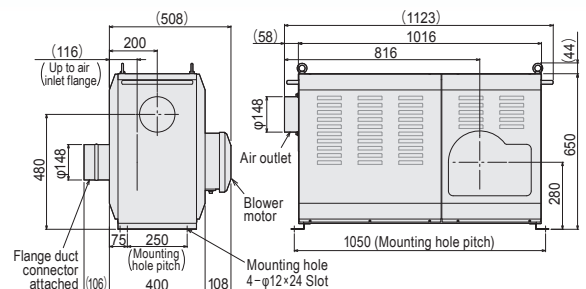
NEW



HAS2302H / HAS2403H (3P 200V 30kW / 40kW)



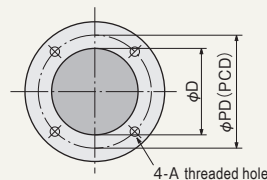
NEW



Air inlet



Air inlet dimensions



Model No.	φ D	φ PD	A
HAS2032 · 2052 · 2077	75	96	M5
HAS2082 · 2102	100	120	
HAS2152H · 2202H	125	140	M8
HAS2302H · 2403H	150	180	
HAS2601 · 2801	200	240	

Air inlet for all model are positioned at the direct opposite of the blower motor. HAS2032~HAS2202H are attached with adjustable air damper (Damping rate: approximately 10~100%). HAS2302H~HAS2801 are attached with flange damper.

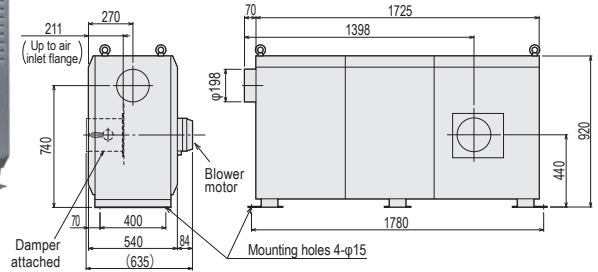
Comes without controller and electrical parts, suitable to be built into other machinery. Can be used independently and has the same dimensions of the HAP series. Perfect to be used with existing controller to control the Hot Air Generator. Can be attached with SSR, electromagnetic contactor or other devices.

Casing material: Steel plate (coated)

HAS2601 / HAS2801 (3P 200V 60kW / 80kW)



NEW



HAS2000 SERIES

Build-to-order items that support different power supply can be manufactured (refer page 19).

In stock	◎	◎	◎	◎	◎
Model No.	HAS2032	HAS2052	HAS2077	HAS2082	HAS2102
Product code	00013259	00013260	00013261	00013262	00013263
Power supply	3P 200V (50/60Hz)				
Total power rating	3.2 kW	5.2 kW	7.7 kW	8.3 kW	10.3 kW
Heater power rating	3 kW	5 kW	7.5 kW	8 kW	10 kW
Air outlet air temperature range	R.T.~350°C*2				
Air flow reference value (50/60Hz)	Damper fully opened 4.0 / 4.8 m ³ /min		Damper 2/3 opened 3.2 / 3.8 m ³ /min		Damper 1/3 opened 2.0 / 2.4 m ³ /min
Airflow control	Adjustable air damper*3				
Diameter of air inlet	φ 75 mm (Adjustable air damper attached)			φ 100 mm (Adjustable air damper attached)	
Diameter of air outlet	φ 73 mm Stainless steel pipe			φ 98 mm Stainless steel pipe	
Suction air temperature range	-10~230°C				
Blower specifications	Max airflow (50/60Hz)		5.4 / 6.2 m ³ /min		8.8 / 10.4 m ³ /min
	Max static pressure (50/60Hz)		0.63 / 0.91 kPa		0.95 / 1.35 kPa
	Blower power rating		3P 200V 0.15 kW		3P 200V 0.3 kW
	Noise at max. airflow (50/60Hz)*4		70 / 74 dB		75 / 78 dB
Weight	26 kg			32 kg	
Operating environment	Ambient temperature : 0 ~ 40°C		Relative humidity : Below 80% RH (Provided that no condensation occurs)		

In stock	◎*1	◎*1	◎*1	◎*1		
Model No.	HAS2152H	HAS2202H	HAS2302H	HAS2403H	HAS2601	HAS2801
Product code	00013264	00013265	00013266	00013267	00013291	00013294
Power supply	3P 200V (50/60Hz)					
Total power rating	16.5 kW	21.5 kW	31.5 kW	41.5 kW	63.7 kW	83.7 kW
Heater power rating	15 kW	20 kW	30 kW	40 kW	60 kW	80 kW
Air outlet air temperature range	R.T. ~ 350°C*2					
Air flow reference value (50/60Hz)	Damper fully opened 15.0 / 17.5 m ³ /min		Damper 2/3 opened 12.4 / 14.8 m ³ /min		Damper 1/3 opened 7.5 / 9.1 m ³ /min	
Airflow control	Adjustable air damper*3					
Diameter of air inlet	φ 125 mm (Adjustable air damper attached)		φ 148 mm (Adjustable air damper attached)		φ 198 mm (Adjustable air damper attached)	
Diameter of air outlet	φ 123 mm Stainless steel pipe		φ 148 mm Stainless steel pipe		φ 198 mm Stainless steel pipe	
Suction air temperature range	-10 ~ 230°C					
Blower specifications	Max airflow (50/60Hz)		20.8 / 24.0 m ³ /min		30 / 34 m ³ /min	
	Max static pressure (50/60Hz)		1.65 / 2.37 kPa		1.95 / 2.8 kPa	
	Blower power rating		3P 200V 1.5 kW		3P 200V 3.7 kW	
	Noise at max. airflow (50/60Hz)*4		85 / 90 dB		87 / 90 dB	
Weight	69 kg	73 kg	110 kg	117 kg	245 kg	260 kg
Operating environment	Ambient temperature : 0 ~ 40°C		Relative humidity : Below 80% RH (Provided that no condensation occurs)			

*1: Shipment on the next day may not apply for some areas.

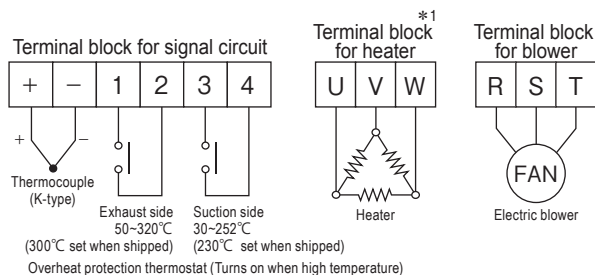
*2: Air temperature varies depending on usage conditions. Please use it below the maximum temperature. (Refer page 28)

*3: When adjusting airflow by changing the frequency of the inverter, please make sure that the frequency is within the range of 30-60Hz.

*4: This is the value of the blower alone. The actual noise varies greatly depending on the conditions.

HAS2000 SERIES CIRCUIT DIAGRAM

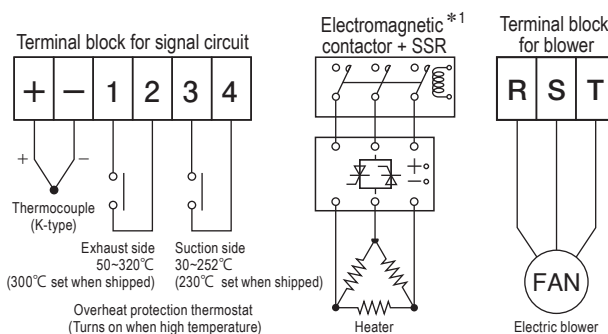
STANDARD PRODUCT



For each model, removing the side cover on the right when facing the air outlet will uncover the terminal block, please conduct wiring for each circuit. Particularly, the blower should be wire in phase rotation (RST), please do not wire wrongly. Overheat protection thermostat for air outlet (50~320°C) and air inlet (30~252°C) are set at 300°C and 230°C respectively. Please use the overheat protection circuit. The specifications of the contacts are 250V 16A (resistance load).

CIRCUIT DIAGRAM FOR EQUIPPED ELECTRICAL PARTS Circuit diagram for build to order items with electrical parts equipped

○ Electromagnetic contactor + SSR (solid state relay)



Electromagnetic contact and SSR equipped models do not have heater terminal block due to the SSR attached. In addition, the wiring is already completed for electromagnetic contactor downstream to the SSR upstream, and also for SSR downstream to the heater. Please wire the

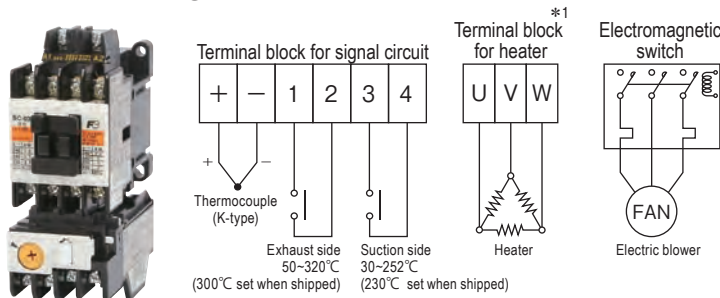
heater power cable to the upstream side of the electromagnetic contactor. SSR should be used for temperature control, and SSR drive signal (DC5~24V) from the temperature controller should be wired to the SSR signal input terminal. Electromagnetic contactor should be used as an overheat protection device.



Notes
 When using electromagnetic contactor as overheat protection device, please wire the circuit so that the overheat protection thermostat signal is able to cut off the power to the heater. The Hot Air Generator built-in thermostat signal will be turned on when overheat error occurs. Please utilize relays or other devices and wire the circuit to convert the signal so that an off signal is input to the electromagnetic contactor during overheat error.

Applicable models	Electromagnetic contactor ratings	SSR ratings
HAS2032, HAS2052	20A Input AC200V	AC100~240V 20A Input DC3.5~30V
HAS2077, HAS2082	32A Input AC200V	AC100~240V 30A Input DC3.5~30V
HAS2102	50A Input AC200V	AC100~240V 35A Input DC12~24V
HAS2152H		AC100~240V 50A Input DC3.5~30V
HAS2202H	80A Input AC200V	AC100~240V 80A Input DC3.5~30V
HAS2302H	100A Input AC200V	AC100~240V 120A Input DC3.5~30V
HAS2403H	135A Input AC200V	
HAS2601	200A Input AC200V	AC100~240V 120A Input DC3.5~30V (*2 inputs)
HAS2801	260A Input AC200V	

○ Electromagnetic switch



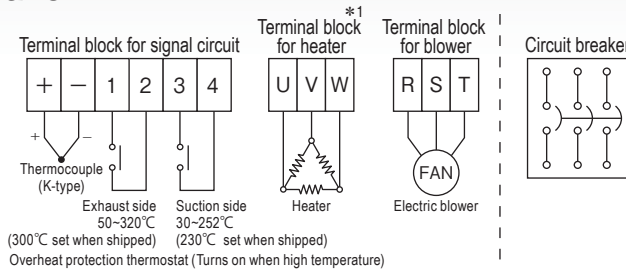
Electromagnetic switch equipped models do not have blower terminal block due to the electromagnetic switch attached. Please wire the blower power cable to the upstream side of the electromagnetic switch. The downstream side to the blower is already wired. (If electromagnetic switch is purchased separately, please complete the downstream wiring to the blower.) Please do not wire the phase rotation wrongly. Furthermore, if the thermal overload relay is turned on due to blower over current, make sure that the circuit is able to cut off the power to the heater.

Applicable models	Ratings
HAS2032~HAS2077	Coil voltage AC200V, thermal overload relay current rating 0.9A
HAS2082, HAS2102	Coil voltage AC200V, thermal overload relay current rating 1.7A
HAS2152H, HAS2403H	Coil voltage AC200V, thermal overload relay current rating 6.6A
HAS2601, HAS2801	Coil voltage AC200V, thermal overload relay current rating 15A

* 1 : HAS2403H has 2 sets of heater circuit, with 2 terminal blocks for heater. However, for SSR equipped build to order items, only 1 SSR is attached. HAS2601, HAS2801 have 2 sets of heater circuit, with 2 terminal blocks for heater. In this case, for SSR equipped build to order items, 2 SSR are attached.

HAS2000 SERIES CIRCUIT DIAGRAM

○ Circuit breaker



For circuit breaker equipped models, the circuit breaker is attached to the left side when facing the air outlet. The same terminal blocks for standard products are located on the right side when facing the air outlet. Please wire the respective circuits.

* 1 : HAS2403H has 2 sets of heater circuit, with 2 terminal blocks for heater. However, for SSR equipped build to order items, only 1 SSR is attached.
HAS2601, HAS2801 have 2 sets of heater circuit, with 2 terminal blocks for heater. In this case, for SSR equipped build to order items, 2 SSR are attached.

Applicable models	Ratings
HAS2032	3P 30AF/15AT
HAS2052	3P 30AF/20AT
HAS2077	3P 30AF/30AT
HAS2082	3P 50AF/40AT
HAS2102	3P 50AF/50AT
HAS2152H	3P 60AF/60AT

Applicable models	Ratings
HAS2202H	3P 100AF/ 75AT
HAS2302H	3P 125AF/125AT
HAS2403H	3P 250AF/150AT
HAS2601	3P 250AF/225AT
HAS2801	3P 400AF/300AT

HOW TO ORDER HOT AIR GENERATOR 2000 SERIES WITH DIFFERENT POWER SUPPLY

Build-to-order manufacturing for different power supplies. When placing order, please specify model No., voltage and frequency category.

■ CHECK EACH CATEGORY

Please check A: model no. for standard product (3P 200V), B: voltage category and C: frequency category.

A	Model no. for standard product (3P 200V)
HAP2032F / HAP2032 / HAS2032	
HAP2052F / HAP2052 / HAS2052	
HAP2077F / HAP2077 / HAS2077	
HAP2082F / HAP2082 / HAS2082	
HAP2102F / HAP2102 / HAS2102	
HAP2152HF / HAP2152H / HAS2152H	
HAP2202HF / HAP2202H / HAS2202H	
HAP2302HF / HAP2302H / HAS2302H	
HAP2403HF / HAP2403H / HAS2403H	
HAP2053T	
HAP2103T	

Voltage of power supply	B	Voltage category
3P 220V	1	
3P 230V	2	
3P 240V	3	
3P 380V	4	
3P 400V	5	
3P 415V	6	
3P 440V	7	
3P 460V	8	
3P 480V	9	

Frequency of power supply	C	Frequency category
50Hz	5	
60Hz	6	

HAP2000F and HAP2000T series can be use for 50/60Hz and do not have frequency category.

■ SPECIFY THE MODEL NO.

Please specify the following according to the series.

HAP2000F SERIES

Model No.	A - B	{ A : Model no. for standard product } + { - } + { B : Voltage category }
(e.g.) HAP2032F 3P 380V (50/60Hz) ... Model No. HAP2032F - 4		

HAP2000T SERIES

Model No.	A - B	{ A : Model no. for standard product } + { - } + { B : Voltage category }
(e.g.) HAP2053T 3P 400V (50/60Hz) ... Model No. HAP2053T - 5		

HAP2000 / HAS2000 SERIES

Model No.	A - B C	{ A : Model no. for standard product } + { - } + { B : Voltage category } + { C : Frequency category }
(e.g.) HAS2152H 3P 220V (50Hz) ... Model No. HAS2152H - 15		

HOT AIR GENERATOR 3000 SERIES

Hot Air Generator with high static air pressure with the use of vortex flow fan blower.

OUTSTANDING STATIC PRESSURE!!

Demo unit lending or maintenance services can be requested on our homepage.

www.hakko.co.jp



Build to order items that support different power supply can be manufactured.

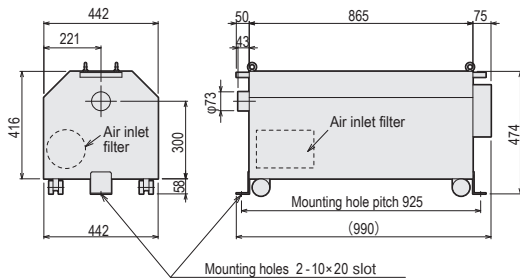
APPLICATIONS

- Warming, heating or drying in industrial oven.
- Water removal or drying after wash.
- Water or other liquid heating by bubbling.

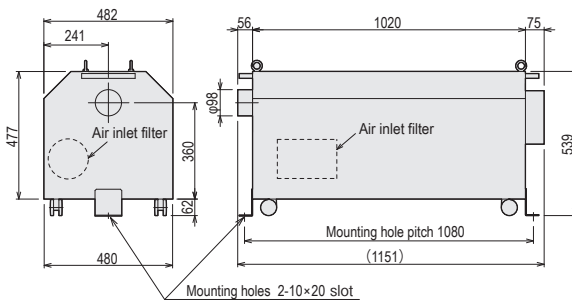
DIMENSIONS & SPECIFICATIONS

Casing material: Steel plate (coated)

HAP3051



HAP3101

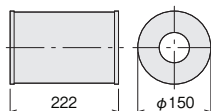
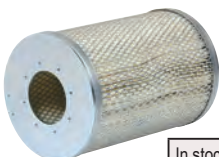


FEATURES

- Equipped with new controller.
- High static air pressure using vortex flow blower, powerful performance for applications with high pressure loss.
- High air pressure for ease of air blow drying.
- Since it uses stainless steel sheathed heater, it is clean and has excellent durability.
- High safety standards.
- Main body and controller are separable, easy to be built into other devices.

In stock		HAP3051	HAP3101
Model No.		HAP3051	HAP3101
Product code		00013297	00013298
Power supply		3P 200V (50/60Hz)	
Total power rating		6.9 kW	13.4 kW
Heater power rating		5 kW	10 kW
Temperature control		PID control (SSR drive)	
Air outlet air temperature range		R.T. + $\alpha^*1 \sim 300^\circ\text{C}$	
Airflow control		Adjustable suction airflow by changing the blower rotation speed with the inverter	
Inverter output frequency setting range		30 ~ 60 Hz	
Airflow adjustment range		1.7 ~ 3.3 m ³ /min	2.6 ~ 4.6 m ³ /min
Diameter of air outlet		$\phi 73\text{mm}$ Stainless steel pipe	$\phi 98\text{mm}$ Stainless steel pipe
Suction air temperature range		- 5 ~ 40°C*2	
Blower specifications	Type	Vortex flow air blower	
	Max. airflow (60Hz)	4.0 m ³ /min	5.5 m ³ /min
	Max. static pressure (60Hz)	19.6 kPa	27.5 kPa
	Blower power rating	1.9 kW	3.4 kW
	Noise at max. airflow (60Hz)	69.5 dB	74.5 dB
	Power cable	2PNC2 4core $\times 3.5\text{mm}^2 \times 3\text{m}$	2PNC2 4core $\times 8\text{mm}^2 \times 3\text{m}$
	Weight	85 kg	125 kg
Operating environment		Ambient temperature : 0 ~ 40°C Relative humidity : Below 80% RH (Provided that no condensation occurs)	

● Air inlet filter (replacement part)



In stock	Model No.	Product code	Applicable models
◎	PFF3000	00951470	HAP3051, HAP3101

* 1: α = approximately 15°C when operating at 60Hz. Refer page 27.

* 2: Not to be used in hot air recirculation system.

No sign : [Build-to-order]

Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

HOT AIR GENERATOR 4000 SERIES

Series that uses metal sheathed heater even with small size

Demo unit lending or maintenance services can be requested on our homepage.
www.hakko.co.jp

Features

- Excellent durability with the use of stainless steel sheathed heater
- High power even with small size and high safety standards. Can be use for 150°C hot air recirculation system.

Applications

- Warming, heating, drying or browning in industrial oven.
- Moisture removal or drying after wash.
- Drying or hardening of adhesive used in electronic components.
- Preheat or drying of painted/coated parts.
- Heating, sterilization or defrosting of food equipment.

HAP4000 SERIES

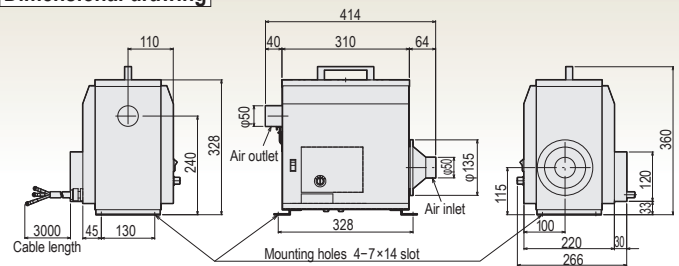
Light and compact design. Built-in controller for easy temperature control.

HAP4020 (1P 200V 2kW)
HAP4030 (1P 200V 3kW)

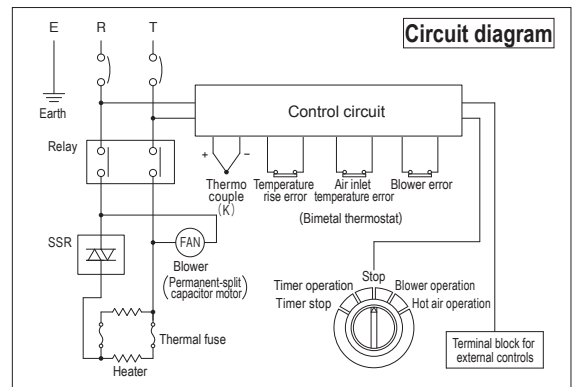


Dimensional drawing

Casing material: Steel plate (coated)



Circuit diagram

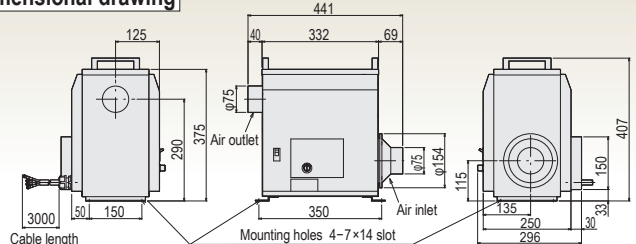


HAP4530 (3P 200V 3kW)
HAP4550 (3P 200V 5kW)

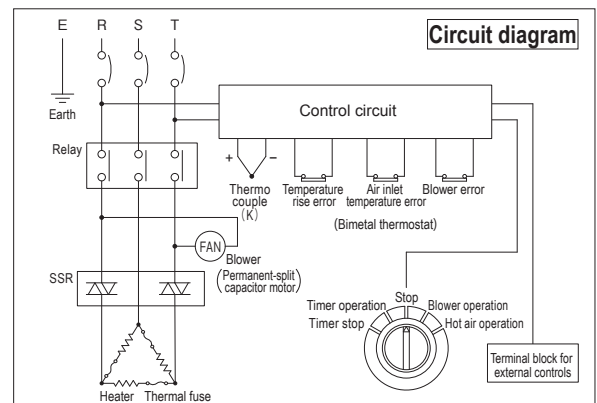


Dimensional drawing

Casing material: Steel plate (coated)

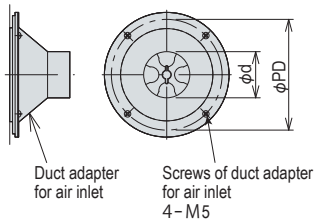


Circuit diagram

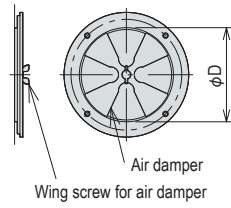


Air inlet

w/ Duct adapter for air inlet



w/o Duct adapter for air inlet



Model No.	φ d	φ D	φ PD
HAP4020 / 4030	50	100	120
HAP4530 / 4550	75	125	140

- When adjusting airflow, please remove the duct adapter for air inlet duct and rotate the air damper.
- Airflow increases with the removal of the duct adapter for air inlet.
- Please attach the duct adapter for air inlet when operating in recirculation mode.

Operating panel



[Operating function]

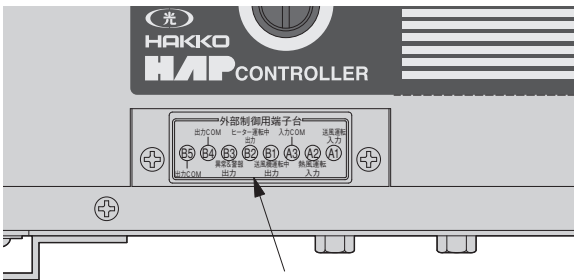
切 (Stop)	Stop operation
送風 (Blower operation)	Operates the blower only
熱風 (Hot air operation)	Run blower and heater
タイマー運転 (Timer operation)*1	Run blower and heater after set time
タイマー停止 (Timer stop)*1	Stops the heater after set time, followed by blower stop after 2 minutes.

* 1 : Range of timer settings 00hr00min~99hrs59min

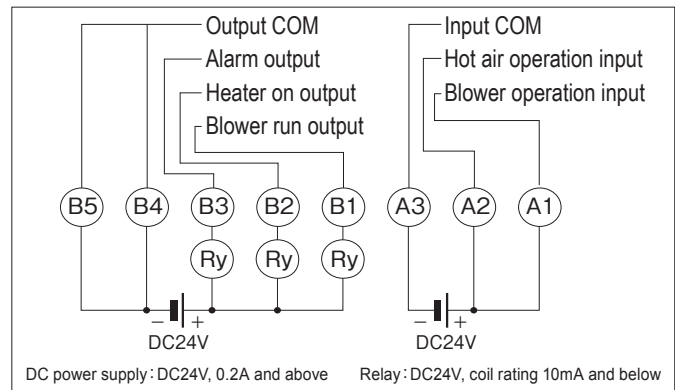
[Display functions]

現在温度 (Temperature now)	Displays when power is on
設定温度 (Temperature set)	Displays when power is on
送風機 (Blower)	Lights up when blower is running
ヒーター (Heater)	Lights up when heater is on
タイマー (Timer)	Blinks or lights up when timer operation or timer stop
温度上昇異常 (Temperature rise error)	Lights up when temperature rise error is detected
吸入口温度異常 (Air inlet temperature error)	Lights up when temperature error at air inlet is detected
送風機異常 (Blower error)	Lights up when error for abnormal temperature rise of the blower motor is detected
警報 (Alarm)	Lights up when temperature control error is detected

Terminal block for external control



Terminal block for external control



HAP4000 SERIES

In stock	◎	◎	◎	◎
Model No.	HAP4020	HAP4030	HAP4530	HAP4550
Product code	00700510	00700520	00700530	00700540
Power supply	1P 200V (50/60Hz)		3P 200V (50/60Hz)	
heating element	Metal sheathed heater			
Heater type				
Power rating	2 kW	3 kW	3 kW	5 kW
Blower	Permanent-split capacitor motor			
Motor type				
Power rating (50/60Hz)	53 / 50 W		62 / 74 W	
Temperature sensor	K-type thermocouple			
Control method	PID control (SSR drive)			
Air outlet air temperature range	R.T. ~ 450°C*2		R.T. ~ 350°C*2	
Max. airflow (50/60Hz)	1.2 / 1.5 m ³ /min (w/ duct adapter) 2.0 / 2.4 m ³ /min (w/o duct adapter)		2.3 / 2.6 m ³ /min (w/ duct adapter) 2.7 / 3.1 m ³ /min (w/o duct adapter)	
Max. static pressure (50/60Hz)	0.18 / 0.26 kPa		0.30 / 0.43 kPa	
Noise at max. airflow (50/60Hz)	59 / 63 dB		65 / 69 dB	
Airflow control	Adjustable suction airflow using air damper			
Diameter of air inlet	φ 50mm Pipe (When attached with duct adapter for air inlet) φ 100mm Hole (When not attached with duct adapter for air inlet)		φ 75mm Pipe (When attached with duct adapter for air inlet) φ 125mm (When not attached with duct adapter for air inlet)	
Diameter of air outlet	φ 50mm Pipe		φ 75mm Pipe	
Suction air temperature range	-10~150°C			
Power cable	VCT 3Core × 3.5mm ² × 3m (1core for earth cable)		VCT 4Core × 3.5mm ² × 3m (1core for earth cable)	
Installation configuration	Horizontal			
Weight	12 kg		16 kg	
Operating environment	Ambient temperature : 0 ~ 40°C		Relative humidity : Below 80% RH (Provided that no condensation occurs)	

*2 : Air temperature varies depending on usage conditions. Please use it below the maximum temperature. Refer page 29.

No sign : [Build-to-order]

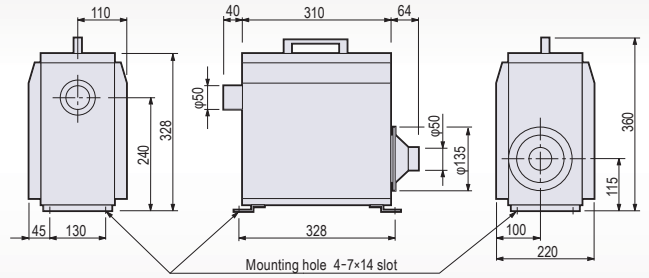
Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

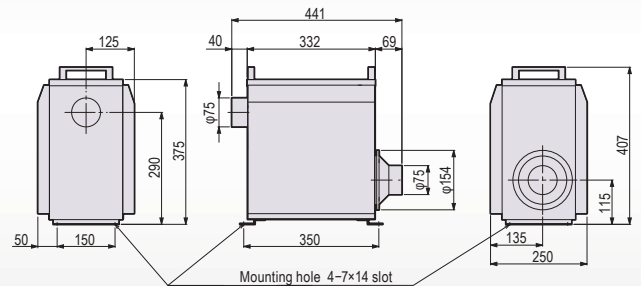
HAS4000 SERIES

Type without controller

- HAS4020** (1P 200V 2kW)
- HAS4030** (1P 200V 3kW)



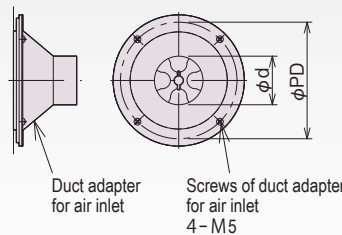
- HAS4531** (3P 200V 3kW)
- HAS4551** (3P 200V 5kW)



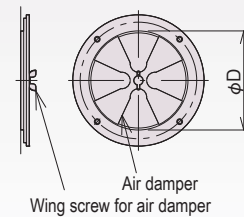
● Air inlet



w/ Duct adapter for air inlet



w/o Duct adapter for air inlet



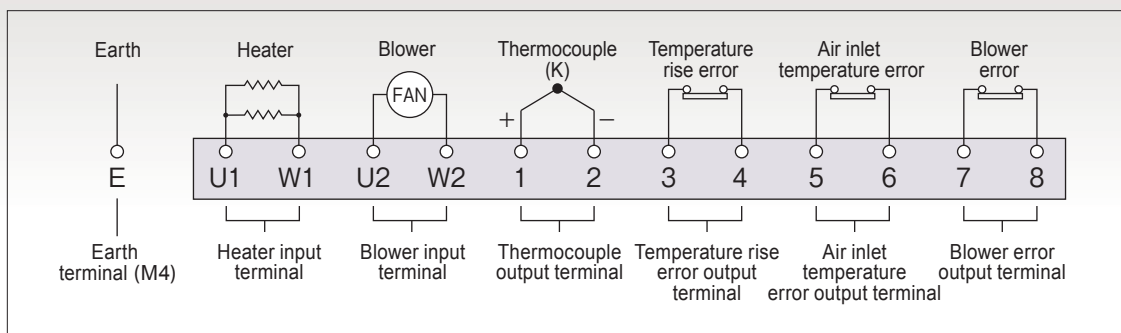
Model No.	φd	φD	φPD
HAS4020 / 4030	50	100	120
HAS4531 / 4551	75	125	140

- When adjusting airflow, please remove the duct adapter for air inlet duct and rotate the air damper.
- Airflow increases with the removal of the duct adapter for air inlet.
- Please attach the duct adapter for air inlet when operating in recirculation mode.

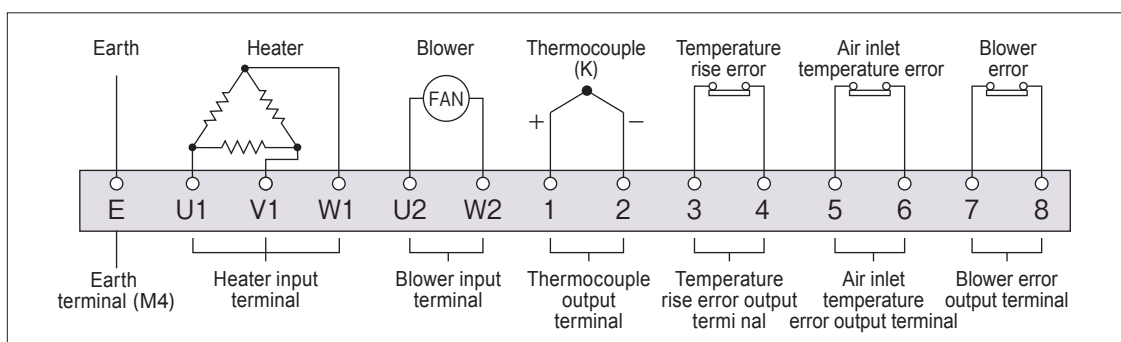
w/o Controller and other electrical parts. Suitable to be built into other machinery. Perfect to be used with existing controller to control the Hot Air Generator.

CIRCUIT DIAGRAM

HAS4020
HAS4030



HAS4531
HAS4551



- For heater input terminal wiring, please take into consideration the impacts of ambient temperature, jacket material (insulation material) and other factors when deciding the wire size. HAS4020/HAS4531: 1.25 mm² and above. HAS4030/HAS4551: 2.0 mm² and above.
- Please use K-type extension grade wires for thermocouple output terminal wiring.
- The screw size for terminal block is M3.5.
- Error outputs are NC contacts ("Open" when error occurs).

HAS4000 SERIES

In stock		◎	◎	◎	◎
Model No.		HAS4020	HAS4030	HAS4531	HAS4551
Product code		00700610	00700620	00700631	00700641
heating element	Heater type	Metal sheathed heater			
	Power supply	1P 200V (50/60Hz)		3P 200V (50/60Hz)	
	Power rating	2 kW	3 kW	3 kW	5 kW
Blower	Motor type	Permanent-split capacitor motor			
	Power supply	1P 200V (50/60Hz)			
	Power rating (50/60Hz)	53 / 50 W		62 / 74 W	
Temperature sensor		K-type thermocouple			
Air outlet air temperature range		R.T. ~ 400°C *1		R.T. ~ 300°C *1	
Max. airflow (50/60Hz)		1.2 / 1.5 m ³ /min (w/ duct adapter)		2.3 / 2.6 m ³ /min (w/ duct adapter)	
		2.0 / 2.4 m ³ /min (w/o duct adapter)		2.7 / 3.1 m ³ /min (w/o duct adapter)	
Max. static pressure (50/60Hz)		0.18 / 0.26 kPa		0.30 / 0.43 kPa	
Noise at max. airflow (50/60Hz)		59 / 63 dB		65 / 69 dB	
Airflow control		Adjustable suction airflow using air damper			
Diameter of air inlet		φ 50mm pipe (When attached with duct adapter for air inlet)		φ 75 mm pipe (When attached with duct adapter for air inlet)	
		φ 100mm Hole (When not attached with duct adapter for air inlet)		φ 125 mm Hole (When not attached with duct adapter for air inlet)	
Diameter of air outlet		φ 50 mm Pipe		φ 75 mm Pipe	
Suction air temperature range		-10~150°C			
Power cable		11 kg		15 kg	
Operating environment		Ambient temperature : 0 ~ 40°C		Relative humidity : Below 80% RH (Provided that no condensation occurs)	

*1: Air temperature varies depending on usage conditions. Please use it below the maximum temperature. (Refer page 29.)

No sign : [Build-to-order]

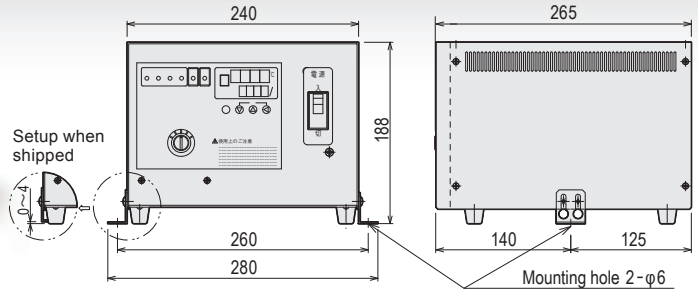
Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

HBC4000 Separate controller for HAS4000 series

HBC4000

NOT TO BE USED FOR HAS2000 SERIES



In stock	
Model No.	HBC4000
Product code	00890010
Power input voltage	1P or 3P 200V *1
Rated frequency	50 / 60Hz
Output voltage for heater	1P or 3P 200V *2
Output current for heater	15 A
Output voltage for blower	1P 200V
Output current for blower	1 A
Device for temperature settings	Electronic digital display
Range of Temperature settings	0 ~ 400°C *3
Display accuracy	Indicated value $\pm(0.3\%+1 \text{ digit})$, or $\pm 2^\circ\text{C}$, whichever larger (when ambient temperature is $23^\circ\text{C} \pm 10^\circ\text{C}$)
Temperature control method	PID control (SSR drive)

Temperature sensor	K-type thermocouple
Operation mode	Stop, blower operation, hot air operation, timer operation, timer stop
Range of timer settings	00hr 00min ~ 99hrs 59min
Alarm function	Cuts off power to the heater and blower when an error signal is detected from the alarm or the 3 thermostat contact signals (NC) Alarm : Output signal with OR logic for temperature control error, thermocouple burnout and controller internal fall sensor.
External controls	Blower and hot air operation control using DC24V power input signal.
External outputs	Blower operation, hot air operation and alarm output on the external control terminal block
Installation configuration	Horizontal*4
Weight	Approximately 7 kg
Operating environment	Ambient temperature : 0 ~ 40°C Relative humidity : Below 80% RH (Provided that no condensation occurs)

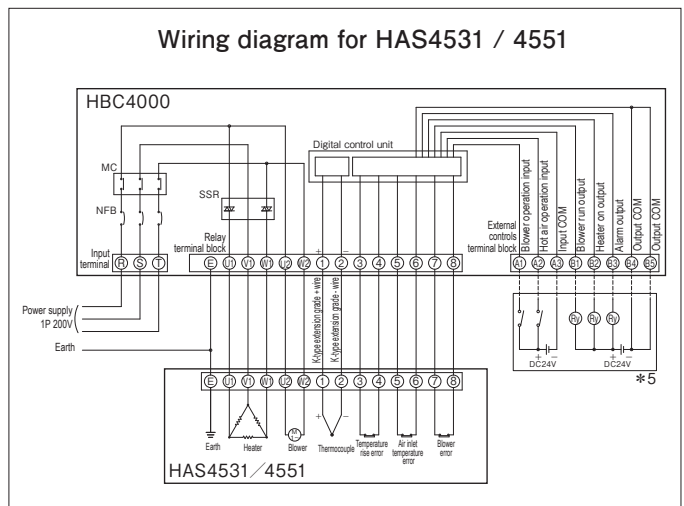
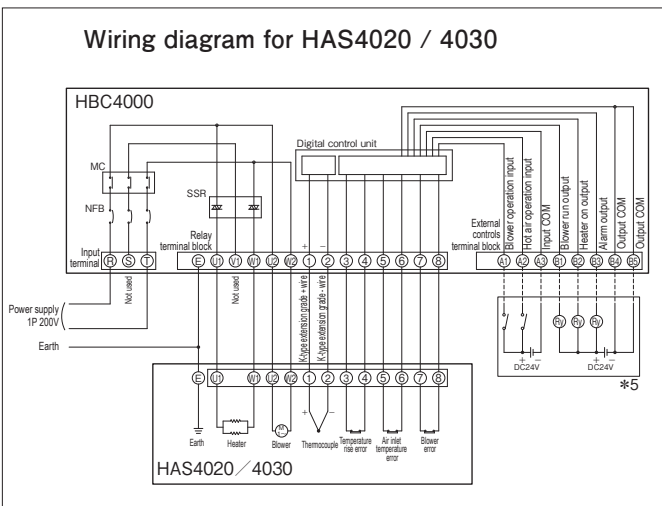
*1: Use 1P 200V power supply for HAS4020/HAS4030. For HAS4531/HAS4551, use 3P 200V power supply.

*2: For HAS4020/HAS4030, output is 1P 200V.

*3: For HAS4531/HAS4551, please set the temperature within the range of 0°C ~300°C.

*4: Do not install with configurations other than horizontal. Internal parts will overheat, which may cause malfunctioning.

■ Wiring diagram with HAS4000 series



*5 DC power supply for external controls: DC24V, 0.1A and above.

Relay for external controls: DC24V, coil rating 10mA and below

HOT AIR GENERATOR 6000 SERIES

High temperature recirculation hot air generator that can operate at 340°C for intake and 450°C for outlet air

MODEL CHANGE



IMPROVED CONTROLLER FUNCTIONS



Equipped with controller and inverter for easy temperature and airflow control.

FEATURES

- Equipped with new controller.
- Since it uses stainless steel sheathed heater, it is clean and has excellent durability.
- High safety standards.
- Robust design.
- Supports hot air recirculation system for intake air temperature of up to 340°C.
- Capable of temperature control of up to max 450°C for air outlet of Hot Air Generator.
- Box for electrical parts and controller can be separated for controlling from an area apart (Optional cables are required).

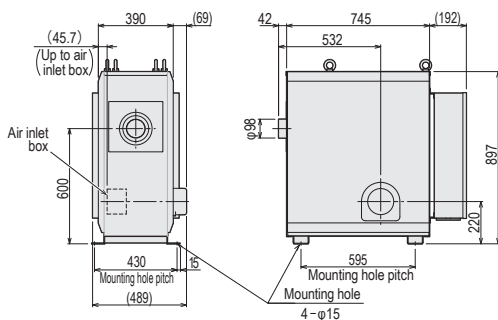
APPLICATIONS

- Warming, heating or drying in industrial oven.
- Water removal or drying after wash.
- Preheat or drying of painted/coated parts.
- Heat source for various ovens.

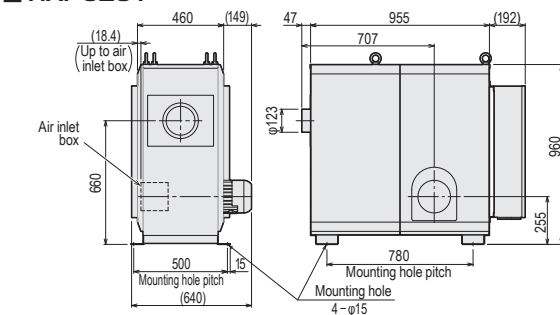
Build to order HAS type items w/o controller and other electrical parts can be made.

DIMENSIONS & SPECIFICATIONS

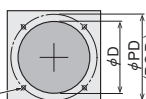
■ HAP6101



■ HAP6201



Dimensions of air inlet box



Model type	φD	φPD	A
HAP6101	φ100	φ120	M5
HAP6201	φ125	φ140	M5

Air inlet for all model are positioned at the direct opposite of the blower motor.

Please consult us for use with different power supply or high temperature optional parts.

In stock		
Model No.	HAP6101	HAP6201
Product code	00013299	00070004
Power supply	3P 200V (50/60Hz)	
Total power rating	10.3kW	21.5kW
Heater power rating	10kW	20kW
Air outlet air temperature range	R.T.~ 450°C*1	
Airflow adjustment range (30~60Hz)	4.3 ~ 8.3m ³ /min	8.1 ~ 15.8m ³ /min
Airflow control	Adjustable suction airflow by changing the blower rotation speed with the inverter	
Inverter output frequency setting range	30 ~ 60 Hz	
Diameter of air inlet	φ 100 Hole	φ 125 Hole
Diameter of air outlet	φ98 Stainless steel pipe	φ123 Stainless steel pipe
Suction air temperature range	-10 ~ 340°C	
Blower specifications	Max. airflow (60Hz)	10.3m ³ /min
	Max. static pressure (60Hz)	1.36kPa
	Blower power rating	3P 200V 0.3kW
	Noise at max. airflow (60Hz)*2	78 dB
Power cable	2PNCT 4core × 8mm ² × 3m	2PNCT 4core × 22mm ² × 3m
Weight	145 kg	190 kg
Operating environment	Ambient temperature : 0 ~ 40°C Relative humidity : Below 80% RH (Provided that no condensation occurs)	

*1 : Air temperature varies depending on usage conditions. Please use it below the maximum temperature. Refer page 28.

*2 : This is the value of the blower alone. The actual noise varies greatly depending on the conditions.

No sign : [Build-to-order]

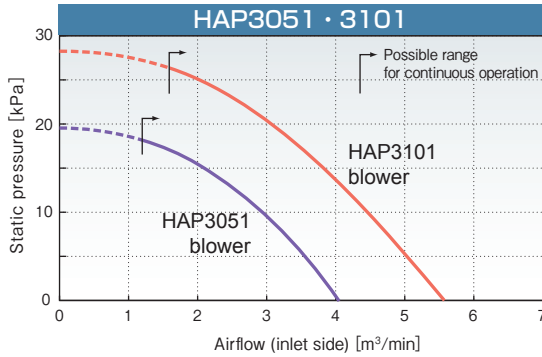
Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

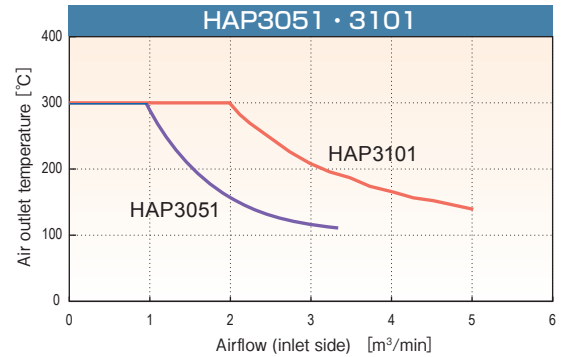
PERFORMANCE CHARACTERISTICS OF

3000 series

● Performance characteristics of blower

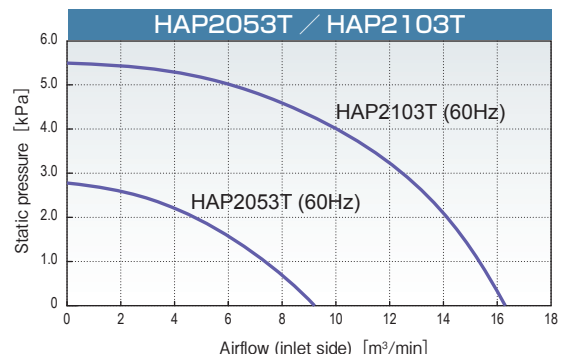
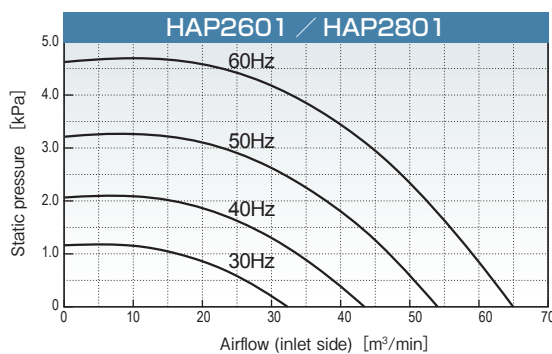
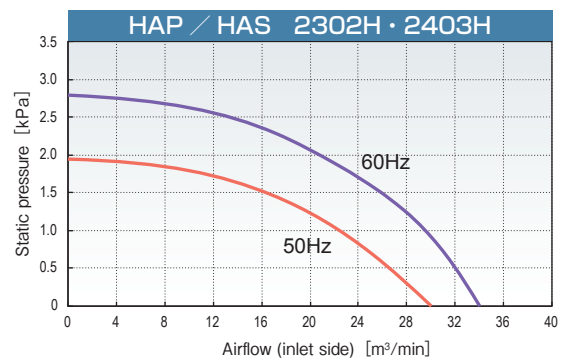
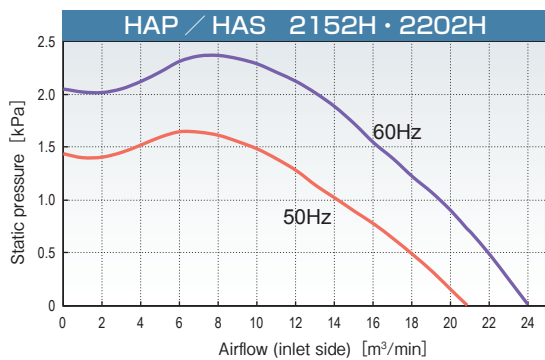
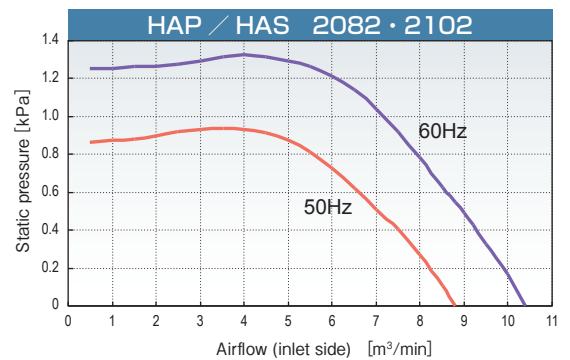
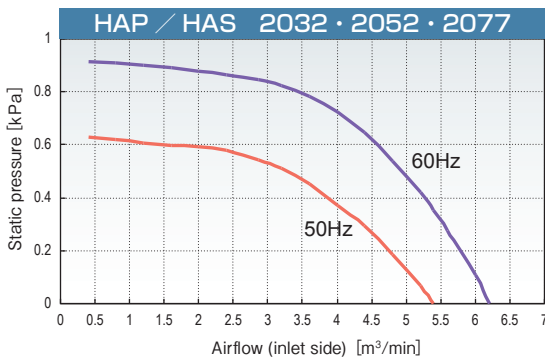


● Relationship between hot air temperature and airflow (air intake temperature: 20°C)



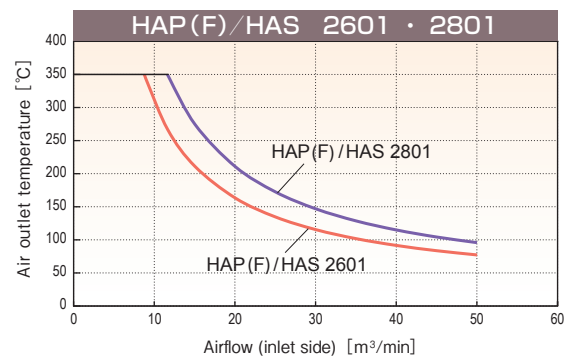
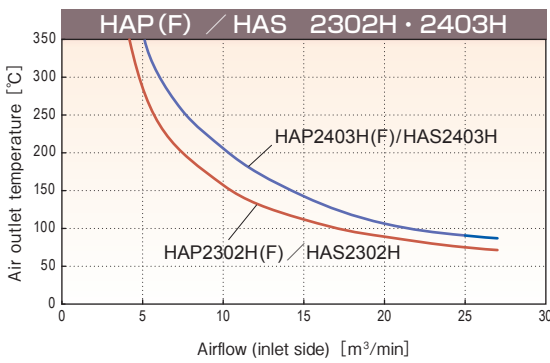
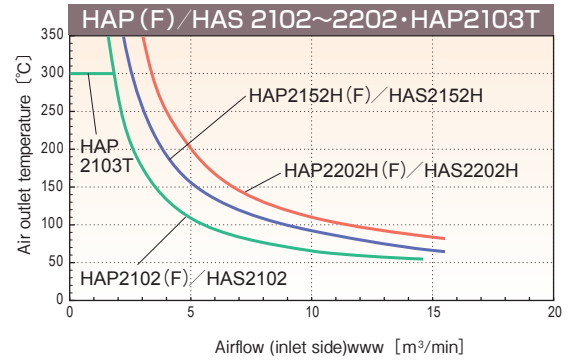
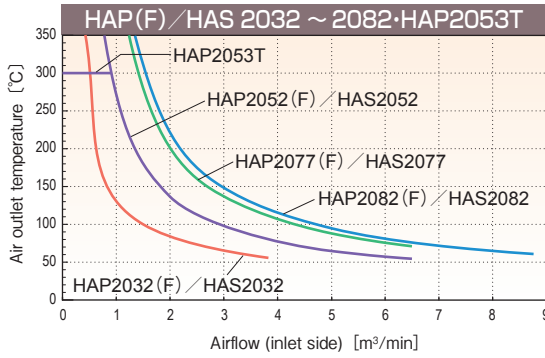
2000 series

● Performance characteristics of blower



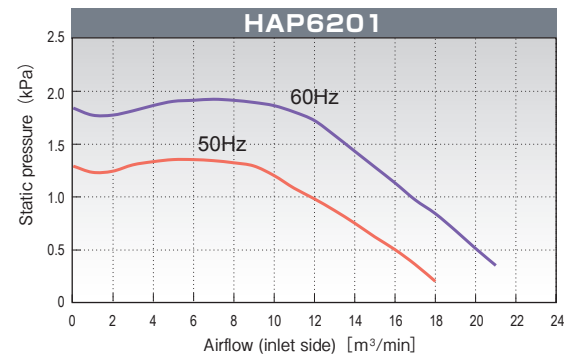
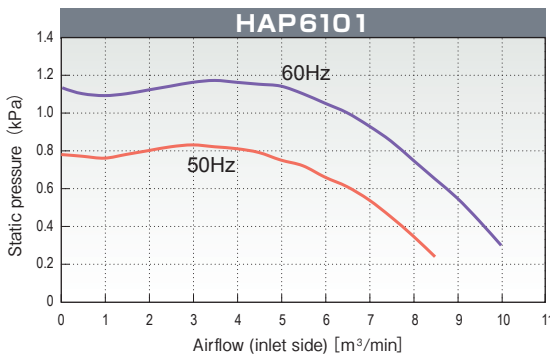
HOT AIR GENERATOR BY MODEL

● Relationship between hot air temperature and airflow (air intake temperature: 20°C)

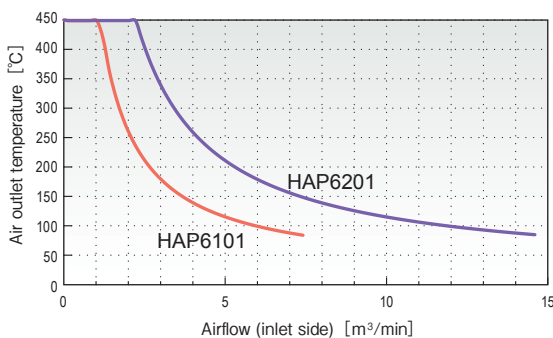


■ 6000 series

● Performance characteristics of blower



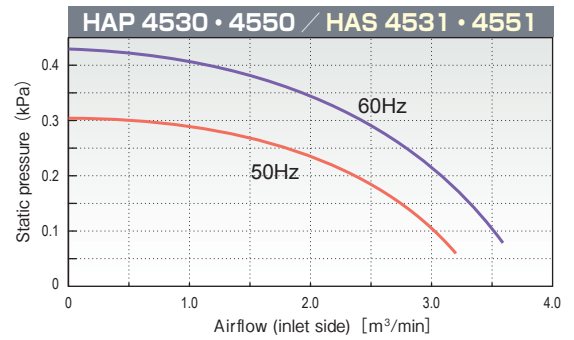
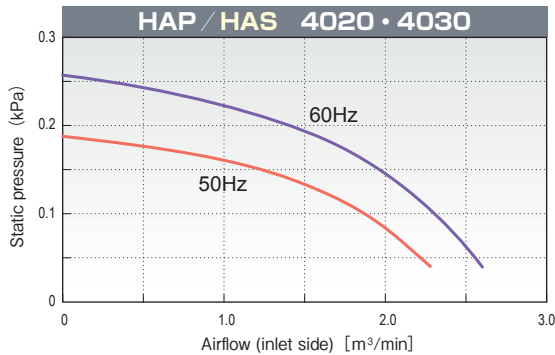
● Relationship between hot air temperature and airflow (air intake temperature: 20°C)



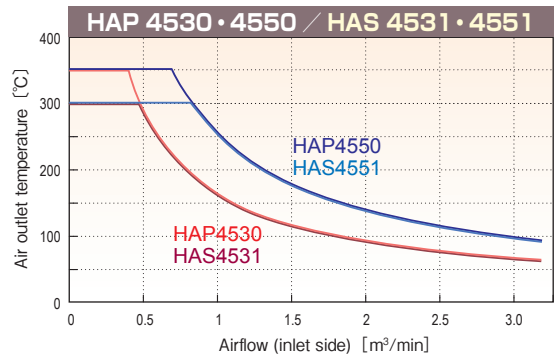
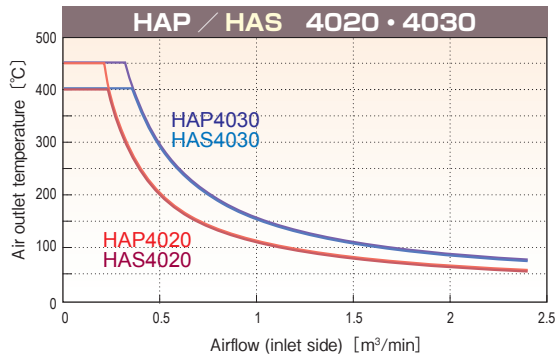
PERFORMANCE CHARACTERISTICS OF HOT AIR GENERATOR BY MODEL

4000 series

● Performance characteristics of blower

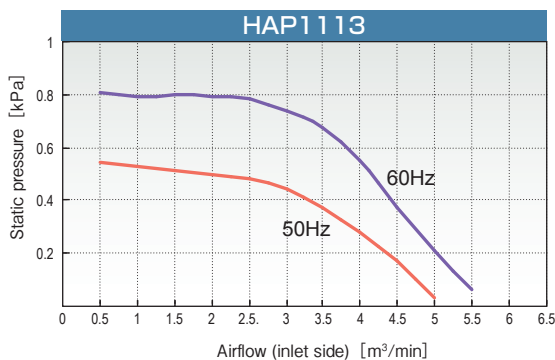


● Relationship between hot air temperature and airflow (air intake temperature: 20°C)

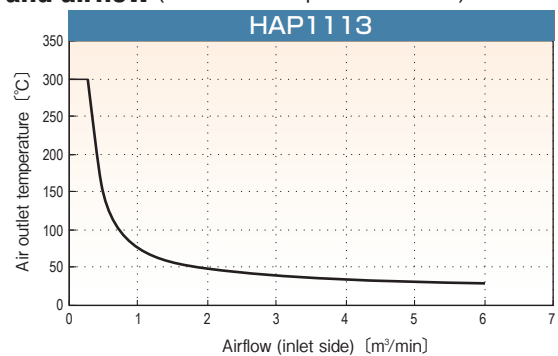


100V HOT AIR GENERATOR

● Performance characteristics of blower

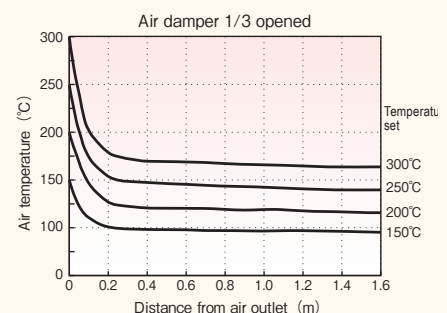
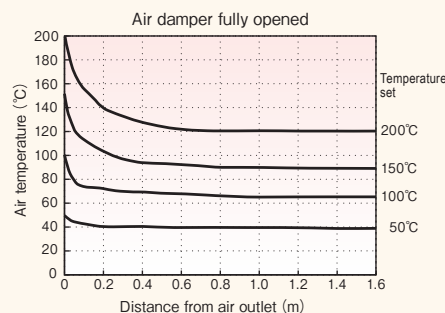


● Relationship between hot air temperature and airflow (air intake temperature: 20°C)



Reference data

When a $\phi 100$ pipe (1.8m long) is connected to the air outlet of HAP2102(10kW), the air temperature "distance from the air outlet - temp. of the pipe center" is higher for the center of the pipe, therefore the temperature on the surrounding will be lower than that value.



HOT AIR GENERATOR CUSTOMIZED PRODUCT

Manufacturing of Hot Air Generator that supports all sort of environment according to customer's application. Please consult us for more details.

● Clean room or food processing Hot Air Generator

- Supported models: Hot Air Generator 2000 series (Excludes HAP2000T series), 100V Hot Air Generator
- Please provide information regarding application, operating temperature, installation location (inside or outside of clean room), unusable materials etc.

■ Standard specification

- Clean room standard: Class 1000 clean room
- Stainless steel material for gas connecting parts
- Oil removal for parts used

■ Others

- Heat resistant high performance filter
- Support other insulating material (use of insulation with low particle generation) etc

Combination example

Hot Air Generator + Heat resistant high performance filter



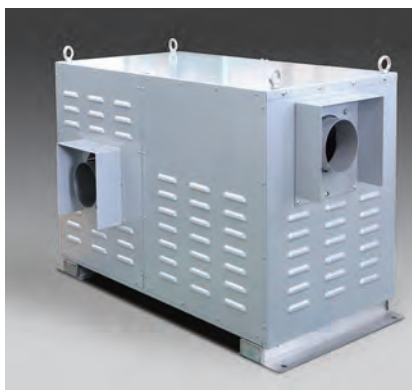
● Outdoor/ Dust-proof Hot Air Generator

- Uses HAS type (w/o electrical parts) Hot Air Generator and a dedicated controller to meet each specification.
- Please rest assured because it is exclusively designed for the intended use.

- **Supported models :**
HAS2000 series equivalent

- **Temperature control :**
PID control or ON/OFF control

Example product Outdoor use



■ Specifications for reference

Hot Air Generator (Build to order)	
Power rating	3P 200V 30kW (50/60Hz)
Air outlet air temperature range	0 ~ 350 °C
Suction air temperature range	-10 ~ 230 °C
Operation and temperature control	According to the separated dedicated controller
Operating environment	Outdoor, ambient temperature : 0 ~ 40 °C Relative humidity : Below 90% RH (No condensation)
IP code Reference value for energized part	IP43

Separated controller	
Power rating	3P 200V (50/60Hz)
Temperature control	ON / OFF control or PID control
Blower operation control	Inverter drive or electromagnetic switch
Error detection and alarm	Temperature control error, Overheat error, blower error, external error signal input, emergency stop others
Protection functions	ELCB (power, heater circuit etc), thermal overload relay (blower protection) others
Operating environment	Outdoor, ambient temperature : 0 ~ 40 °C Relative humidity : Below 90% RH (No condensation)
IP code (Reference value)	IP43

Example product Hot Air Generator for foundry

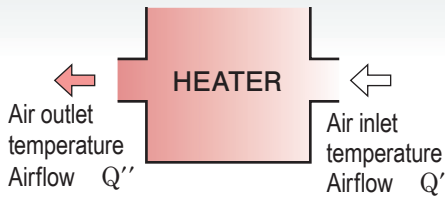


■ Specifications for reference

Hot Air Generator	Standard HAS2000 series
Controller	
Power rating	3P 200V (50/60Hz)
Temperature control	ON / OFF control
Blower operation control	Inverter drive or electromagnetic switch
Error detection and alarm	Temperature control error, Overheat error, blower error, external error signal input, emergency stop others
Protection functions	ELCB (power, heater circuit etc), thermal overload relay (blower protection) others
Operating environment	Outdoor, ambient temperature : 0 ~ 40 °C Relative humidity : Below 90% RH (No condensation)
IP code (Reference value)	IP4X

TECHNICAL CALCULATION MATERIALS FOR CHOOSING HOT AIR GENERATOR

Hot air generation applications



$$\text{Heating power [kW]} = \frac{Q \times (\text{Air outlet temperature } [^{\circ}\text{C}] - \text{Air inlet temperature } [^{\circ}\text{C}])}{45}$$

Q [m³/min] is the airflow at standard conditions (0°C, 1atm)

Q' [m³/min], Q'' [m³/min] varies according to temperature [°C]

$$Q' = Q \times \frac{273 + \text{Air inlet temperature } [^{\circ}\text{C}]}{273} \quad Q'' = Q \times \frac{273 + \text{Air outlet temperature } [^{\circ}\text{C}]}{273}$$

Hot air recirculation applications

● Heating power required to raise the temperature of oven

(100% hot air recirculation)

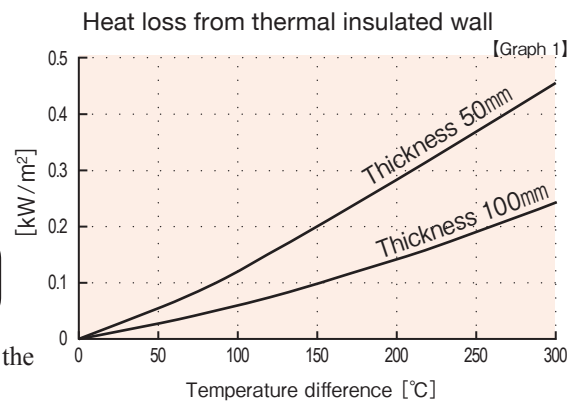
A : Inner surface area of oven [m²]

B : Time for temperature increase [h]

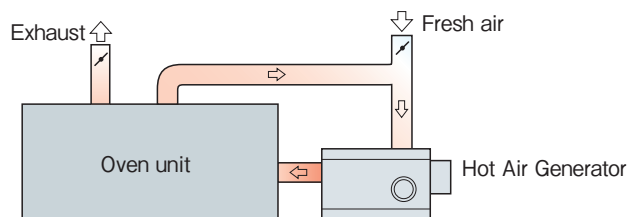
H [kW/m²] is the heat loss from thermal insulated wall
(obtained from Graph 1)

$$\text{Heat power [kW]} = A \times \left(\frac{0.006 \times \text{Temperature increase } [^{\circ}\text{C}]}{\text{Time for temperature increase [h]}} + 0.7 \times H \right)$$

※ The heating power is for reference use. It varies greatly depending on the structure of the oven (thickness of the inner wall and heat insulation).



● Heating power required during oven operation



(A) Heating power required to heat the work

Weight amount of work : A [kg]

Specific heat of work : B [J/kg°C]

$$\text{Heat power [kW]} = \frac{A \times B \times \text{Temperature increase } [^{\circ}\text{C}]}{3,600,000 \times \text{Time for temperature increase [h]}}$$

(B) Heating power for moisture drying

Weight of moisture to be evaporated : A [kg]

$$\text{Heat power [kW]} = \frac{A \times 0.63}{\text{Time for drying [h]}}$$

(C) Heat loss from the oven

$$\text{Heat power [kW]} = \text{Inner surface area of oven [m}^2\text{]} \times H \text{ [kW/m}^2\text{]}$$

H [kW/m²] is obtained from graph 1

(D) Heat loss from exhaust

※ Exhaust and room temperature fresh air intake

$$\text{Heat power [kW]} = \frac{\text{Exhaust airflow [m}^3\text{/min]} \times (\text{Exhaust air temperature } [^{\circ}\text{C}] - \text{R.T. } [^{\circ}\text{C}])}{50}$$

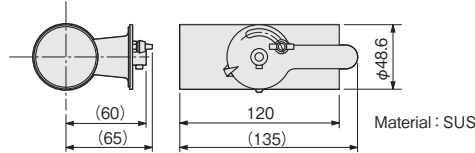
Heating power (A) + (B) + (C) + (D) is required during oven operation

HOT AIR GENERATOR OPTIONAL PARTS

We have various parts for Hot Air Generator. Please order according to your application.

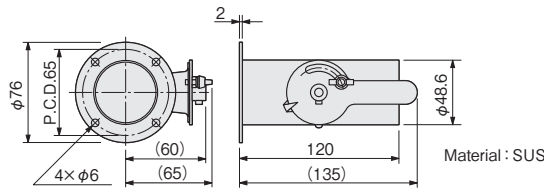
Damper Use for airflow adjustment of duct outlet or inlet.

SUS (stainless steel) is recommended for operating temperature of 250°C and above.

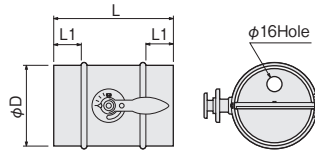


In stock	Model No.	Product code
☉	PSD1050	00950295

Single flange damper

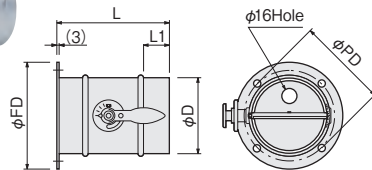


In stock	Model No.	Product code
☉	PSD0050	00950205



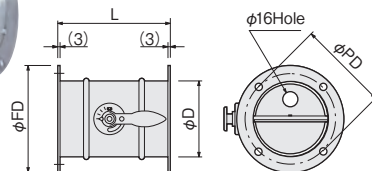
In stock	Model No.	Product code	Dimensions (mm)			Material
			ϕD	L	L 1	
☉	PPD1075	00950250	73	150	25	Steel + Coating
☉	PPD1100	00950260	98	220	50	
	PPD1125	00950270	123			
	PPD1150	00950280	148			
	PPD1200	009502020	198	220	50	SUS
	PSD1075	00950255	73			
	PSD1100	00950265	98			
	PSD1125	00950275	123			
	PSD1150	00950285	148			
	PSD1200	009502025	198			

Single flange damper



In stock	Model No.	Product code	Dimensions (mm)					Material
			ϕD	L	L 1	ϕFD	ϕPD	
☉	PPD0075	00950210	73	150	25	108	96	Steel + Coating
☉	PPD0100	00950220	98	220	50	135	120	
☉	PPD0125	00950230	123			154	140	
	PPD0150	00950240	148			200	180	
	PPD0200	009502030	198			260	240	SUS
	PSD0075	00950215	73	150	25	108	96	
	PSD0100	00950225	98	220	50	135	120	
	PSD0125	00950235	123			154	140	
	PSD0150	00950245	148			200	180	
	PSD0200	009502035	198			260	240	

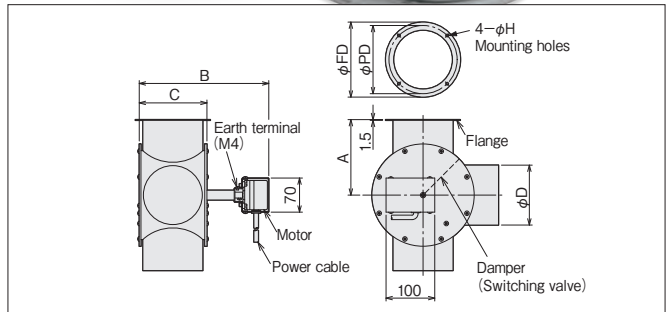
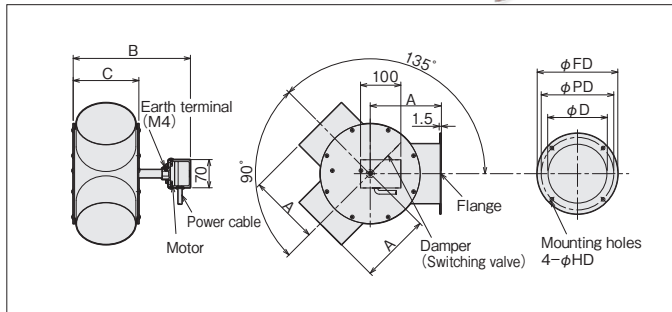
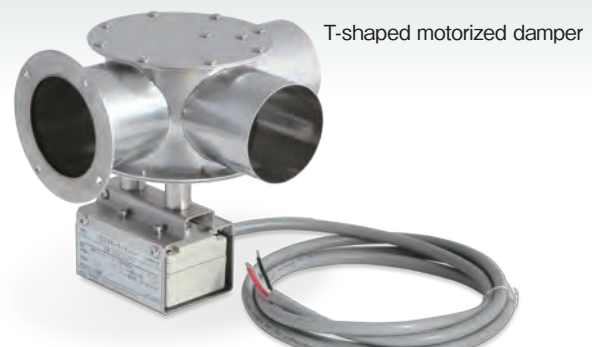
Double flange damper



In stock	Model No.	Product code	Dimensions (mm)				Material	
			ϕD	L	ϕFD	ϕPD		
	PPD2075	00950113	73	185	108	96	Steel + Coating	
	PPD2100	00950123	98	220	135	120		
	PPD2125	00950133	123		154	140		
	PPD2150	00950143	148		200	180		
	PPD2200	009502040	198			260	240	SUS
	PSD2075	00950115	73	185	108	96		
	PSD2100	00950125	98	220	135	120		
	PSD2125	00950135	123		154	140		
	PSD2150	00950145	148		200	180		
	PSD2200	009502045	198			260	240	

3way motorized damper / T-shaped motorized damper

3 way valve that switches flow path with a motor. Since switching is performed by the motor, it contributes to labor saving.

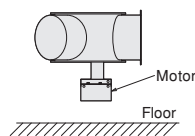


Product name	3way motorized damper			T-shaped motorized damper			
In stock							
Model No.	PMD1075	PMD1100	PMD1125	PMD2075	PMD2100	PMD2125	
Product code	00952110	00952120	00952130	00952140	00952150	00952160	
Nominal diameter	ϕ 75	ϕ 100	ϕ 125	ϕ 75	ϕ 100	ϕ 125	
Dimensions (mm)	A	110	135	110	135	155	
	B	201	216	201	216	266	
	C	88	113	139	88	113	139
	ϕ D	73	98	123	73	98	123
	ϕ FD	108	135	154	108	135	154
	ϕ PD	96	120	140	96	120	140
ϕ H	6	6	6	6	6	6	
Power supply	1P 200V (50 / 60Hz)						
Power rating	4 W						
Operating fluid	Air						
Temperature range of air inside damper	0 ~ 350 °C						
Maximum airflow* (Reference value)	8 m ³ /min	15 m ³ /min	24 m ³ /min	8 m ³ /min	15 m ³ /min	24 m ³ /min	
Damper travel time	6 s / 5 s (50Hz / 60Hz)						
Operating environment	For indoor use only 0~40°C Relative humidity : Below 90% RH (Provided that no condensation occurs)						
Material for gas connecting parts	Stainless steel						
Air leakage	Approx. 10% leakage on the closed damper side						
Power cable	VCT 3core × 0.75 mm ² × 2 m						
Weight	2.4 kg	2.8 kg	3.8 kg	2.4 kg	2.8 kg	3.8 kg	

* : Max. airflow : Value where switching is possible and airflow through damper is at standard conditions (0°C, 1atm).

Installation configuration

Install the motor so that it is on the side that faces the floor as in the figure. Hot air flowing through the damper might damage the motor.

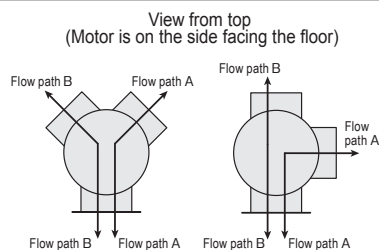


How to use

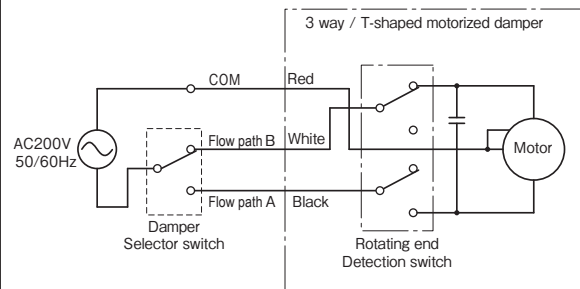
Switching direction and wiring color

Damper operation	Wire color for power supply
Flow path A	Red-Black
Flow path B	Red-White

- For flow path A, please supply AC200V power for red-black wiring.
- For flow path B, please supply AC200V power for red-white wiring.



Wiring diagram



Caution: Damper selector switch is not included. Please order separately.

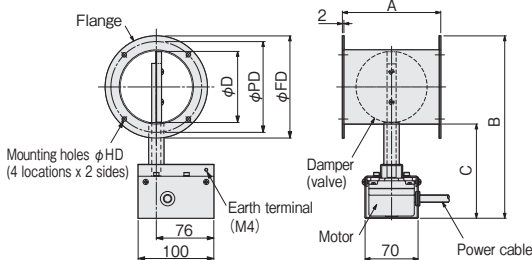


Please use 1 damper selector (open/close) switch for each motorized damper if using multiple motorized dampers (3 way/ T-shape motorized damper). Damper selector switch should not be connected to other load other than the motorized damper. If 1 damper selector switch is used with multiple dampers or other loads, the damper's operation will be unstable, and the switch at the rotation end will cause chattering, leading to early failure.

HOT AIR GENERATOR OPTIONAL PARTS

Motorized damper

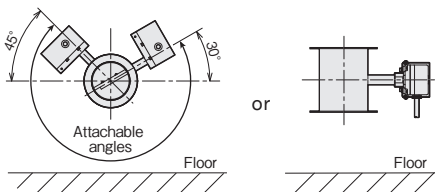
A damper that opens or closes the valve with a motor. Since switching is performed by electrical signal, it contributes to labor saving.



- To open the damper, please supply AC200V power for red-white wiring.
- To close the damper, please supply AC200V power for red-black wiring.

Installation configuration

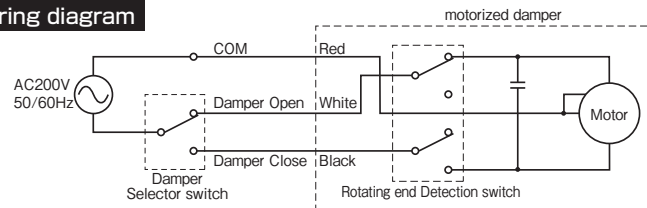
Please attach the motor within the angles as shown in the figure.



In stock		◎	◎	◎	◎
Model No.	PMD0075	PMD0100	PMD0125	PMD0150	
Product code	00951810	00951820	00951830	00951840	
Nominal diameter	φ 75	φ 100	φ 125	φ 150	
Dimensions (mm)	A	120	130	150	170
	B	215	241	282	333
	C	125	125	144	159
	φ D	73	98	123	148
	φ FD	108	135	154	200
	φ PD	96	120	140	180
φ HD	6	6	6	9	
Power supply	1P 200V (50/60Hz)				
Power rating	4 W				
Operating fluid	Air				
Temperature range of air inside damper	0 ~ 350 °C				
Maximum airflow *	8 m ³ /min	15 m ³ /min	24 m ³ /min	35 m ³ /min	
Damper rotation angle	90°				
Damper travel time	6 s / 5 s (50/60Hz)				
Operating environment	For indoor use only 0~40°C Relative humidity : Below 90% RH (Provided that no condensation occurs)				
Material for gas connecting parts	Stainless steel				
Power supply	VCT 3core × 0.75mm ² × 2m				
Weight	1.5 kg	1.7 kg	2 kg	2.4 kg	

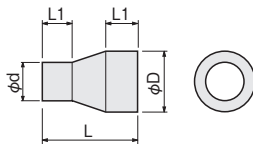
* Max. airflow : Value where switching is possible and airflow through damper is at standard conditions (0°C ,1atm).

Wiring diagram



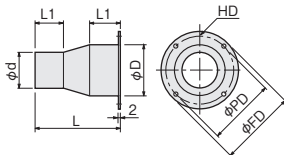
Reducer

For connecting ducts or other parts with different sizes.



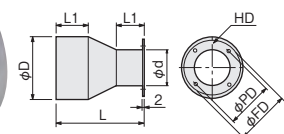
In stock	Model No.	Product code	Dimensions (mm)					Material
			φ D	φ d	L	L1	Thickness	
◎	PSZ7007	00950898	63	48.6	90	30	1.0	SUS
◎	PSZ7008	00950900	73	63				
◎	PSZ7009	00950903	98		48.6		90	
◎	PSZ2007	00950875	73	120				
◎	PSZ2008	00950885	98	73	100	40	1.0	
◎	PSZ7001	00950890	123	98	120			
◎	PSZ7003	00950893	148	123	140	50	1.5	
◎	PSZ7006	00950895	198	148	180			

Flange reducer



In stock	Model No.	Product code	Dimensions (mm)							Material	
			φ D	φ d	φ FD	φ PD	L	L1	HD		Thickness
◎	PSZ7117	00950803	63	48.6	92	80	90	30	4 × φ 6	1.0	SUS
◎	PSZ7118	00950805	73	63	108	96					
◎	PSZ7119	00950808	98		48.6	135	120		100	1.2	
◎	PSZ2117	00950978	73	108		96	90				
◎	PSZ2118	00950988	98	73	135	120	100	40	1.0		
◎	PSZ7111	00950780	123							98	
◎	PSZ7113	00950783	148	123	200	180	140	50	4 × φ 9	1.5	
◎	PSZ7116	00950785	198	148	260	240	180				

Flange reducer



In stock	Model No.	Product code	Dimensions (mm)							Material	
			φ D	φ d	φ FD	φ PD	L	L1	HD		Thickness
◎	PSZ7107	00950795	63	48.6	76	65	90	30	4 × φ 6	1.0	SUS
◎	PSZ7108	00950798	73	63	92	80					
◎	PSZ7109	00950800	98				48.6		76	65	
◎	PSZ2107	00950975	73	108	96	100					
◎	PSZ2108	00950985	98	73	108	96	100	40	1.0		
◎	PSZ7101	00950788	123							98	
◎	PSZ7103	00950790	148	123	154	140	140	50	4 × φ 9	1.5	
◎	PSZ7106	00950793	198	148	200	180	180				

No sign : [Build-to-order]

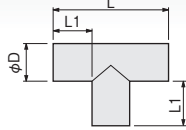
Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

Duct fittings

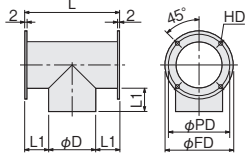
Please take consideration of the space for ducting and select the appropriate fittings.

T-shaped duct fitting



In Stock	Model No.	Product Code	Dimensions (mm)				Material
			phi D	L	L1	Thickness	
⊙	PST0050	00951005	48.6	120	35	1.0	SUS
⊙	PST1075	00951050	73	145			
⊙	PST1100	00951055	98	190	46	1.2	
⊙	PST1125	00951060	123	215			
⊙	PST1150	00951065	148	240	61	1.5	
⊙	PST1200	00951000	198	320			

Flange T-shaped duct fitting Type-A

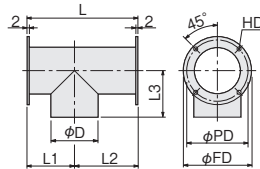


In Stock	Model No.	Product Code	Dimensions (mm)							Material
			phi D	phi FD	phi PD	L	L1	HD	Thickness	
⊙	PST6075	00951070	73	108	96	145	35	4 x phi 6 x2sides	1.0	SUS
⊙	PST6100	00951075	98	135	120	190				
⊙	PST6125	00951080	123	154	140	215	46	4 x phi 9 x2sides	1.2	
⊙	PST6150	00951085	148	200	180	240				
⊙	PST6200	00951090	198	260	240	320	61	1.5		

Thickness of PST6200 flange: 3mm

Asymmetrical Type-A

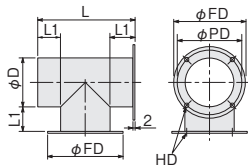
NEW



In Stock	Model No.	Product Code	Dimensions (mm)								Material	
			phi D	phi FD	phi PD	L	L1	L2	L3	HD		Thickness
⊙	PST6575	00013220	73	108	96	180	70	110	72	4 x phi 6 x2sides	1.0	SUS
⊙	PST6600	00013221	98	135	120	220	90	130	95			
⊙	PST6625	00013222	123	154	140	260	110	150	108	4 x phi 9 x2sides	1.2	
⊙	PST6650	00013223	148	200	180	350	120	230	120			
⊙	PST6700	00013224	198	260	240	520	160	360	160	1.5		

Thickness of PST6700 flange: 3mm

Flange T-shaped duct fitting Type-B

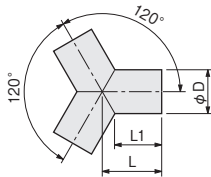


In Stock	Model No.	Product Code	Dimensions (mm)							Material
			phi D	phi FD	phi PD	L	L1	HD	Thickness	
⊙	PST7075	00951071	73	108	96	145	35	4 x phi 6 x2sides	1.0	SUS
⊙	PST7100	00951076	98	135	120	190				
⊙	PST7125	00951081	123	154	140	215	46	4 x phi 9 x2sides	1.2	
⊙	PST7150	00951086	148	200	180	240				
⊙	PST7200	00951095	198	260	240	320	61	1.5		

Thickness of PST7200 flange: 3mm

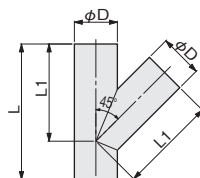
Please refer to the flanged connector for the welding angle and the flange dimensions.

Wye duct fitting Type-A



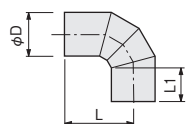
In Stock	Model No.	Product Code	Dimensions (mm)				Material
			phi D	L	L1	Thickness	
⊙	PSY0050	00951105	48.6	55	40	1.0	SUS
⊙	PSY1075	00951150	73	65	44		
⊙	PSY1100	00951155	98	75	47	1.2	
⊙	PSY1125	00951160	123	80	44		
⊙	PSY1150	00951165	148	90	47	1.5	
⊙	PSY1200	00951170	198	120	62		

Wye duct fitting Type-B



In Stock	Model No.	Product Code	Dimensions (mm)				Material
			phi D	L	L1	Thickness	
⊙	PST4075	00951750	73	230	165	1.0	SUS
⊙	PST4100	00951755	98	280	205		
⊙	PST4125	00951760	123	325	240	1.2	
⊙	PST4150	00951765	148	390	290		
⊙	PST4200	00951770	198	500	375	1.5	

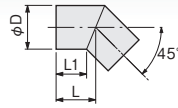
90 degrees elbow duct fitting



In Stock	Model No.	Product Code	Dimensions (mm)				Material
			phi D	L	L1	Thickness	
⊙	PSL9050	00951205	48.6	80	38	1.0	SUS
⊙	PSL0075	00951250	73	92	35		
⊙	PSL0100	00951255	98	120	47		
⊙	PSL0125	00951260	123	136	45	1.2	
⊙	PSL0150	00951265	148	145			
⊙	PSL0200	00951270	198	195	58	1.5	

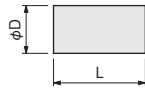
HOT AIR GENERATOR OPTIONAL PARTS

● 45 degrees elbow duct fitting



In Stock	Model No.	Product Code	Dimensions (mm)				Material
			φ D	L	L1	Thickness	
○	PSL4050	00951305	48.6	40	30	1.0	SUS
○	PSL5075	00951350	73	50	35		
○	PSL5100	00951355	98	65	45		
○	PSL5125	00951360	123	70	50	1.2	
○	PSL5150	00951365	148	80		1.5	
○	PSL5200	00951370	198	105	63	1.5	

● Duct connector



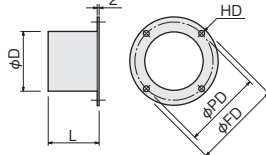
In Stock	Model No.	Product Code	Dimensions (mm)			Material
			φ D	L	Thickness	
○	PSZ0050	00950655	48.6	80	1.5	SUS
○	PSZ5075	00950660	73	70	1.0	
○	PSZ5100	00950665	98	90		
○	PSZ5125	00950670	123		1.2	
○	PSZ5150	00950675	148	100	1.5	
○	PSZ5200	00950678	198	120	1.5	

● Flange duct connector



NEW

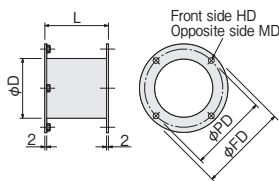
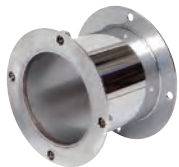
Long type



In Stock	Model No.	Product Code	Dimensions (mm)						Material	
			φ D	φ FD	φ PD	L	HD	Thickness		
○	PSZ1050	00950755	48.6	76	65	40	4 × φ 6	1.5	SUS	
○	PSZ6075	00950760	73	108	96			1.0		
○	PSZ6100	00950765	98	135	120			1.2		
○	PSZ6125	00950770	123	154	140	50	4 × φ 9	1.5		
○	PSZ6150	00950775	148	200	180			1.5		
○	PSZ6200	00950778	198	260	240	65	4 × φ 9	1.5		
○	PSZ3050	00013225	48.6	76	65	150	4 × φ 6	1.5	SUS	
○	PSZ3075	00013226	73	108	96			1.0		
○	PSZ3100	00013227	98	135	120			1.2		
○	PSZ3125	00013228	123	154	140			4 × φ 9		1.5
○	PSZ3150	00013229	148	200	180					1.5
○	PSZ3200	00013230	198	260	240			65		4 × φ 9

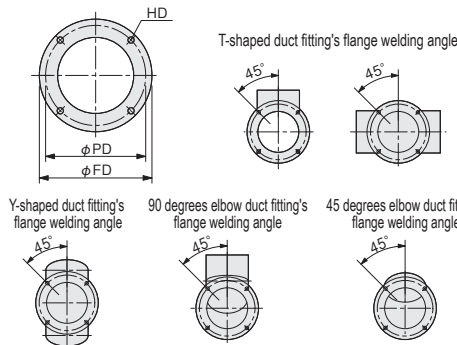
Thickness of PSZ6200 flange: 3mm

● Double flange duct connector



In Stock	Model No.	Product Code	Dimensions (mm)						Material	
			φ D	φ FD	φ PD	L	HD	MD		
○	PSZ8075	00950680	76.3	108	96	77	4 × φ 6	4 × M5	SUS	
○	PSZ8100	00950685	101.6	135	120					1.5
○	PSZ8125	00950690	125	154	140					1.2
○	PSZ8150	00950695	150	200	180	160	4 × φ 9	4 × M8		
○	PSZ8200	00950705	200	260	240					248

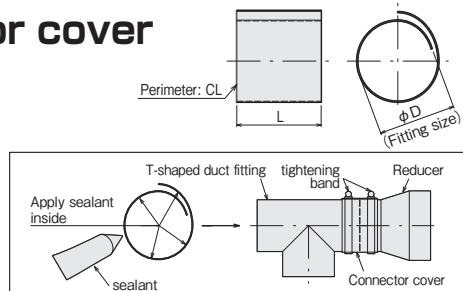
● Flange duct fittings **Build to order**



We accept flange welding for various duct fittings. Please specify the type of duct fitting, location and number of flanges to be welded. Please refer to the figure/table for the flange sizes and welding angles of T-shaped, Y-shaped, 45 and 90 degrees elbow duct fittings.

Diameter of duct fittings	Dimensions (mm)				Material
	φ FD	φ PD	HD	Thickness	
φ 48.6	76	65	4 × φ 6	2	SUS
φ 73	108	96			
φ 98	135	120			
φ 123	154	140	4 × φ 9	3	
φ 148	200	180			
φ 198	260	240			

■ Connector cover



In Stock	Model No.	Product Code	Dimensions (mm)				Material
			φ D	L	CL	Thickness	
○	PSB0050	00950391	48.6	50	210	0.5	SUS
○	PSB0065	00950392	63		260		
○	PSB0075	00950393	73	70	310		
○	PSB0100	00950394	98		410		
○	PSB0125	00950395	123	80	510		
○	PSB0150	00950396	148		610		
○	PSB0200	00950398	198	100	810		

Aluminum tape



For jointing ducts or fixing thermal insulating materials. Maximum operating temperatures of 120°C and 300°C are available. Please choose according to the temperature of use.

In stock	Model No.	Product code	Max. operating temp.	Adhesive	Width × length
⊙	PFZ4001	00950440	120°C	Acrylic type	50mm × 50m
⊙	PFZ4011	00950445	300°C	Silicone type	50mm × 20m

Fiberglass tape



Please use it for thermal insulation of ducts or fittings.

Temperature rating : 250°C
Thickness : 3mm
Length : 10m

In stock	Model No.	Product code	Width
⊙	PFZ4102	00950450	25 mm
⊙	PFZ4104	00950455	40 mm

Sealant



Please use it as a seal or adhesive for the connection parts. Since the mechanical strength is low, please use it together with tightening band or aluminum tape. There are three types with different max. operating temperature.

In stock	Model No.	Product code	Max. operating temp.	Volume
⊙	PFZ4270	00950460	70°C	150 ml
⊙	PFZ4218	00950465	180°C	100g
⊙	ZSR1025	06440010	250°C	(about 95ml)

Duct fittings with mesh

Features

- A simple filter that can be used for the air inlet of Hot Air Generator or air inlet of other duct line.
- Damper with mesh and air inlet fitting with mesh are shipped with the wire mesh attached as optional parts.
- Since the wire mesh is fasten using tightening band, it is easy for replacement (excluding flange with mesh)
- Replacement wire mesh are available (excluding flange with mesh).
- Wire mesh with specifications other than the following can be manufactured.

Precautions for use

- About 10% air loss when the product is used in a state without clogging.
- If damper with mesh or air inlet fitting with mesh is used in a state with clogging, it may cause fire or failure. Please be sure to perform routine maintenance.
- Damper with mesh or air inlet fitting with mesh cannot be connected to flexible duct. To connect flexible duct, please use flange with mesh and flange duct connector in combination.

Damper with mesh



Please refer to page 32 for the dimensions of each damper.

w/o Flange			Single flange			Wire mesh	Material
In stock	Model No. *	Product code	In stock	Model No. *	Product code		
⊙	PSD1050M	00950296	⊙	PSD0050M	00950306	Stainless steel 30 mesh Aperture size 0.6mm	SUS
⊙	PPD1075M	00950252	⊙	PPD0075M	00952215		Steel + Coating
⊙	PPD1100M	00950262	⊙	PPD0100M	00952225		
	PPD1125M	00950272	⊙	PPD0125M	00952235		
	PPD1150M	00950282		PPD0150M	00952245		
	PPD1200M	00952022		PPD0200M	00952535		
	PSD1075M	00950256		PSD0075M	00950316	SUS	
	PSD1100M	00950266		PSD0100M	00950326		
	PSD1125M	00950276		PSD0125M	00950336		
	PSD1150M	00950286		PSD0150M	00950346		
	PSD1200M	00952026		PSD0200M	00952136		

* : Model no. of standard product + M

Air inlet fitting with mesh



Shipped with the wire mesh attached to the flange duct connector.

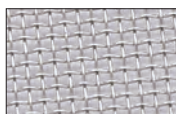
Please refer to page 36 for the dimensions of flange duct connector.

Replacement wire mesh



Place on top of tightening band and push in from above by using the duct fitting, then fasten the wire mesh with the tightening band.

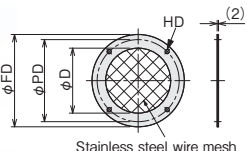
[Enlarged mesh]



In stock	Model No. *	Product code	Wire mesh
⊙	PSZ1050M	00950756	Stainless steel 30 mesh Aperture size 0.6mm
⊙	PSZ6075M	00950761	
⊙	PSZ6100M	00950766	
⊙	PSZ6125M	00950771	
⊙	PSZ6150M	00950776	
	PSZ6200M	00950779	

* : Model no. of standard product + M

Flange with mesh



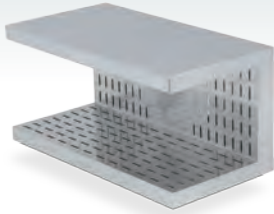
Stainless steel wire mesh

In stock	Model No.	Product code	Dimensions (mm)			Wire mesh	Material
			φD	φFD	φPD		
⊙	PSM0050	00952610	45.6	76	65	30 mesh Aperture size 0.6mm	SUS
⊙	PSM0075	00952620	71	108	96		
⊙	PSM0100	00952630	95	135	120		
⊙	PSM0125	00952640	119	154	140		
⊙	PSM0150	00952650	145.6	200	180		

Nominal diameter of flange with mesh is φ200, joint flange with mesh for HAP2000T series can be manufactured.

HOT AIR GENERATOR OPTIONAL PARTS

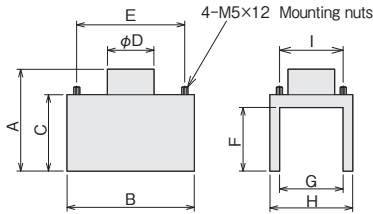
C-shaped hood



Features

- By using it in combination with the Hot Air Generator, a well-balanced heating manner from three directions is possible.
- Since it uses stainless steel, it is clean and has excellent durability.

Dimensions & specifications



Applications

- Heat shrink for shrink sleeve labels, shrink bands, etc.
- Preheat and drying of small parts

Precautions for use

- When hot air is supplied into the hood, the body will become very hot. Install insulation if necessary.
- When attaching ducts, please use tightening band or other tightening parts to securely fasten it.
- Use the mounting nuts and fix the main body before use.

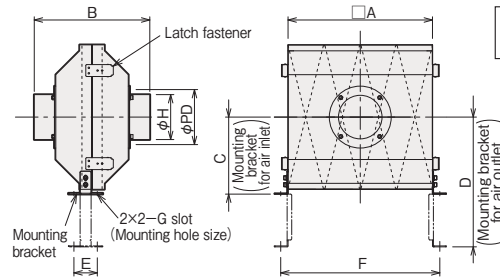
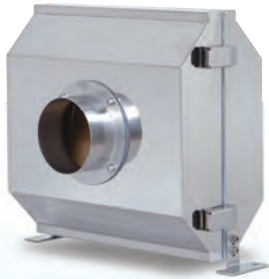
Sizes other than those in the table on the right and/or socket attachment for temperature sensor can be manufactured.

In stock	Model No.	Product code	Dimensions (mm)									Operating temp.	Material	Weight (kg)
			A	B	C	φD	E	F	G	H	I			
	PTS0075	00952910	160	200	120	73	170	100	100	130	100	350°C and below	SUS	1.2
	PTS0100	00952920	165	320	125	98	290	100	100	140	110			2.0
	PTS0125	00952930	185	400	145	123	360	110	130	180	150			3.0
	PTS0150	00952940	245	430	195	148	380	160	150	200	170			4.0

Heat resistant filter

Filter unit with maximum operating temperature of 200°C.

Can be connected to Hot Air Generator (HAP2000 (F) / HAS2000 series, HAP2000 T series, 100V Hot Air Generator) for recirculation of temperatures up to a maximum of 200°C.



Filter is not washable

In stock		PFH0075	PFH1075	PFH0100	PFH1100	PFH0125	PFH0150	PFH0200
Model No.	00954010	00954020	00954030	00954040	00954050	00954060	00954070	
Dimensions	A	315	355	315	490	480	540	805
	B	202		252		262		348
	C	168	190	168	257	250	280	440
	D	283	313	283	412	400	480	740
	E	50	75			95		125
	F	347	387	347	522	512	572	837
	G	6 × 12			7 × 14			
	H	73		98		123	148	198
	PD	96		120		140	180	240
Operating fluid	Air							
Maximum operating temperature	200°C							
Average filtration efficiency *1	90% (Particles of 10 μm)							
Operating environment	Ambient temperature 0 ~ 40°C				80% R.H. and below (Provided that no condensation occurs)			
Filter material	Polyamide							
Main unit material	SUS304							
Weight *2	3.7kg	4.3kg	4.2kg	7.6kg	8.6kg	9.5kg	21kg	
Applicable models	HAP2032 (F) HAP2052 (F) HAP2077 (F) HAS2032 HAS2052 HAS2077 HAP1113	HAP2053T *3	HAP2082 (F) HAP2102 (F) HAS2082 HAS2102	HAP2103T *3	HAP2152H (F) HAP2202H (F) HAS2152H HAS2202H	HAP2302H (F) HAP2403H (F) HAS2302H HAS2403H	HAP2601 (F) HAP2801 (F) HAS2601 HAS2801	

● Replacement filter (filter media)

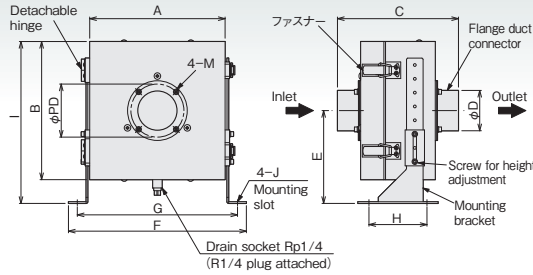
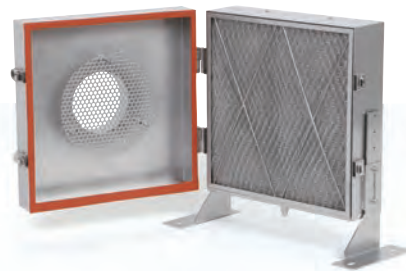
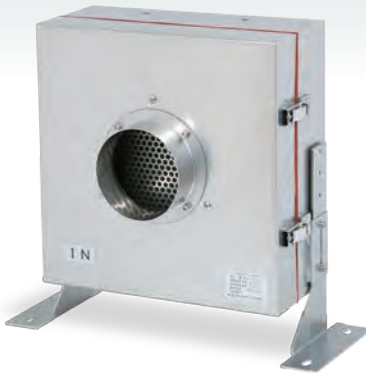
In stock	Model No.	Product code	Size (Height x Length)	Applicable heat resistant filter unit(s)	Quantity
	PFR2075	00954015	310 × 310	PFH0075 PFH0100	1 Set (2 sheets)
	PFR3075	00954025	350 × 350	PFH1075	
	PFR3100	00954045	485 × 485	PFH1100	
	PFR2125	00954055	475 × 475	PFH0125	
	PFR2150	00954065	535 × 535	PFH0150	
	PFR2200	00954075	800 × 800	PFH0200	

*1: Value of filter alone at rated air speed of 1m/s.

*2: Weight excluding the mounting brackets.

*3: When connecting to air intake, separately sold filter joint flange or reducer is required. Please order the filter joint flange or reducer according to the model of use.

Mist filter



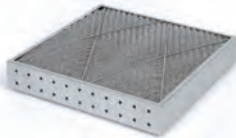
- Can be connected to HAP2000 (F)/ HAS2000 series, HAP2000T series for operating temperatures of up to a maximum of 200°C.
- Increase the life of Hot Air Generator by protecting the blower, heater and other parts from oil mist.
- Can be use for max. 200°C hot air recirculation.
- Filter media can be washed for reuse.

In stock		PFG0075	PFG0100	PFG0125	PFG0150	PFG0200
Model No.		PFG0075	PFG0100	PFG0125	PFG0150	PFG0200
Product code		00952710	00952720	00952730	00952740	00952750
Dimensions	A	245	245	355	420	560
	B	250	250	360	425	565
	C	219	229	249	276	350
	D	73	98	123	148	198
	E	168~293	168~293	250~340	280~385	360~480
	F	322	322	470	535	695
	G	290	290	420	485	635
	H	105	105	130	170	200
	I	293~418	293~418	430~520	493~598	640~760
	J	7×14	7×14	10×20	12×24	15×30
	PD	96	120	140	180	240
M		M5		M8		
Maximum operating temperature		200°C				
Maximum airflow		8 m ³ /min	8 m ³ /min	18 m ³ /min	28 m ³ /min	50 m ³ /min
Filtration efficiency (reference value)		Approximately 90% (At max. airflow for particle size 8 μm and above)*1				
Initial pressure drop at max. airflow (reference value)		120Pa	120Pa	200Pa	350Pa	400Pa
Material		Body : SUS304 (part SUS303)、 Filter media : SUS304				
Weight (mounting brackets included)		6.5 kg	6.5 kg	10kg	12.5kg	20kg
Applicable models		HAP2032(F) HAP2052(F) HAP2077(F)	HAP2082(F) HAP2102(F)	HAP2152H(F) HAP2202H(F)	HAP2302H(F) HAP2403H(F)	HAP2601H(F) HAP2801H(F)
		HAS2032 HAS2052 HAS2077 HAP1113	HAS2082 HAS2102 HAP2053T *2	HAS2152H HAS2202H HAP2103T *2	HAS2302H HAS2403H	HAS2601H HAS2801H

*1: This product is for mist filtering. It cannot filter particles. If required, please use in combination with air inlet filter or heat resistant filter.

*2: When connecting to the air inlet of HAP2000T series, separately sold filter joint flange, reducer is required. Please order the filter joint flange or reducer according to the model of use.

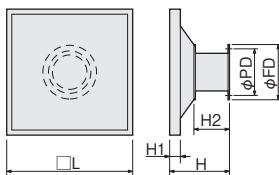
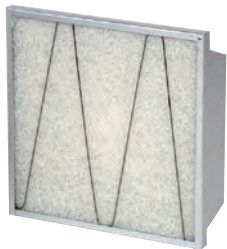
● Replacement filter



In stock		PFR6100	PFR6125	PFR6150	PFR6200
Model No.		PFR6100	PFR6125	PFR6150	PFR6200
Product code		00952715	00952725	00952735	00952745
Size		240×240	350×350	415×415	555×555
Applicable mist filter(s)		PFG0075 PFG0100	PFG0125	PFG0150	PFG0200

Air inlet filter

Use by attaching it to the air inlet. Filter part is washable.



Body and frame material :
Stainless steel

Filter material : Polyester (14mm)
Made by Japan Vilene Company, LTD.

Filtration efficiency :
76 % (Particles of 25μm)
100 % (Particles of 50μm)

In stock	Model No.	Product code	Dimensions (mm)						Applicable models	
			L	H	H 1	H 2	φFD	φPD		
◎	PFF0075	00951410	255	130	18	80	108	96	HAP2032 (F) /2052 (F) /2077 (F), HAS2032/2052/2077, HAP1113	
◎	PFF0100	00951420	285	150			135	120	HAP2082 (F) /2102 (F), HAS2082/2102, HAP2053T*	
◎	PFF0125	00951430	450	170			100	154	140	HAP2152H (F) /2202H (F), HAS2152H/2202H, HAP2103T*
◎	PFF0150	00951440	520	230			160	200	180	HAP2302H(F)/2403H(F), HAS2302H/2403H
◎	PFF1100	00951450	200	120			80	135	120	HAP4020/4030, HAS4020/4030
◎	PFF1125	00951460					154	140	HAP4530/4550, HAS4531/4551	
◎	PFF0200	00951480	690	350	250	260	240	HAP2601 (F) /2801 (F), HAS2601/2801		

* : When connecting to the air inlet of HAP2052T or HAP2102T, separately sold filter joint flange is required. Please order the filter joint flange according to the model of use.

● Replacement filter (Filter media)

In stock	◎	◎	◎	◎	◎	◎
Model No.	PFR0075	PFR0100	PFR0125	PFR0150	PFR0200	PFR1100
Product code	00951415	00951425	00951435	00951445	00951485	00951455
Size (Height x Length)	250×250	280×280	445×445	515×515	685×685	195×195
Applicable air inlet filter unit(s)	PFF0075	PFF0100	PFF0125	PFF0150	PFF0200	PFF1100 PFF1125
Quantity	1 sheet					

HOT AIR GENERATOR OPTIONAL PARTS

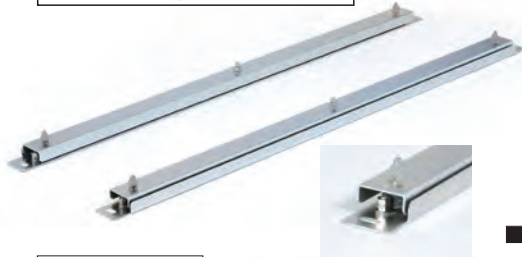
■ Anti-vibration stand

- Prevents trouble for the Hot Air Generator when it is used in places with a lot of vibration.
- Can be shipped with it assembled to the Hot Air Generator.

PDV2100



PDV2107/PDV2110/
PDV2200/PDV2400



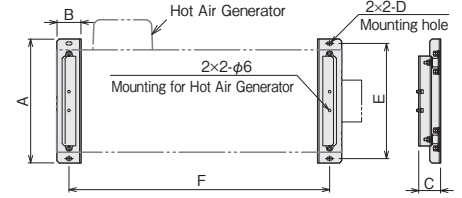
Example of usage



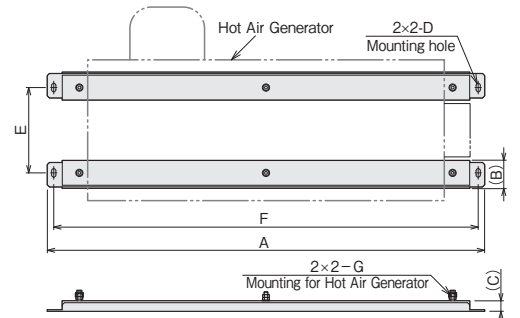
Example of usage



■ PDV2100



■ PDV2107/PDV2110/PDV2200/PDV2400



In stock	Model No.	Product code	Dimensions (mm)							Weight (for 1 set)	Accessories	Applicable models
			A	B	C	D	E	F	G			
◎	PDV2100	00954600	290	56	51	7 × 14slot	270	401	—	2.2 kg	Built-in bolts : (M5×10) 4pieces	HAP1113
◎	PDV2107	00000488	770	47	24.5	7 × 14slot	150	740	M6	5.3 kg	Nuts (M6) : 8 pieces Washer (M6) : 4pieces	HAP2032 (F) ~ HAP2077 (F)、 HAS2032 ~ HAS2077
◎	PDV2110	00000489	870	47	24.5	7 × 14slot	150	840				6.0 kg
◎	PDV2200	00954610	1050	65	24.5	10 × 20slot	200	1020	M8	8.4 kg	Nuts (M8) : 8 pieces Washer (M8) : 4pieces Nut covers (M8) : 4pieces	HAP2152H (F) / HAP2202H (F) HAS2152H / HAS2202H / HAP2103T
◎	PDV2400	00954620			1200	32.5	12 × 24slot	250				1160

Build to order items for HAP2053T can be made

■ Weekly timer attached Hot Air Generator

Build to order

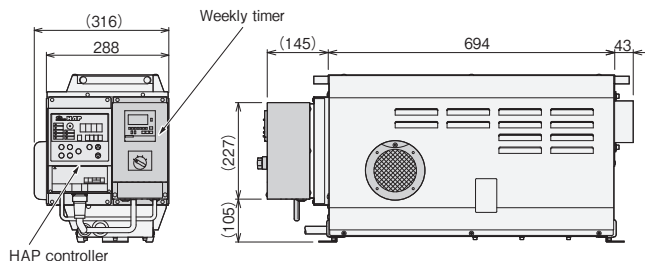


- To turn ON/OFF the Hot Air Generator operation according to the day and time set.
- Can be shipped with it assembled to the Hot Air Generator.



Weekly timer

Dimensions when attached to HAP2101 (reference)



No sign : [Build-to-order]

Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

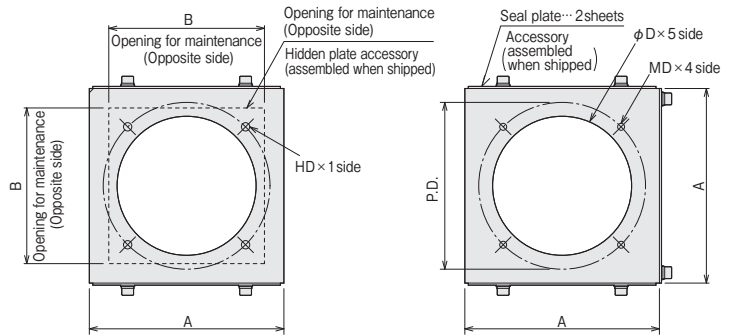
Utility box



- Box for splitting or combining the ducts of Hot Air Generator.
- Can be use in combination with various parts for ducting such as damper, duct fittings etc.
- 5 out of 6 sides can be connected to parts for ducting. (1 side is the opening for maintenance)

Precautions for use

- When hot air is supplied into the box, the body will become very hot. Install insulation if necessary.
- Please use gasket if air is leaking from the part where ducts are connected.
- Please operate at temperatures below the max. operating temperature of the parts for ducting or gasket attached to the utility box.
- The facing of the opening for maintenance has $\phi 6$ or $\phi 9$ through hole for use in combination with double flange duct connector (PSZ8***).
- Regularly check that there are no foreign objects such as sediment in the box or ducting. Continued use with foreign objects may cause a decrease in airflow, malfunction of the hot air generator, or fire.



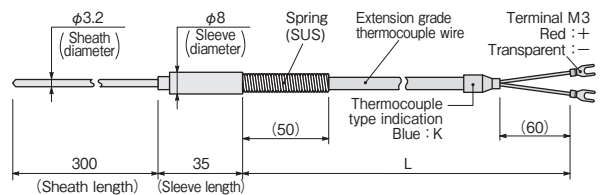
In stock	Model No.	Product code	Nominal diameter	Dimensions (mm)						Body material
				A	B	ϕD	ϕPD	ϕMD	ϕHD	
	PSQ0075	00013231	$\phi 75$	120	92	$\phi 75$	96	4-M5 $\times 4$ side	4- $\phi 6$ $\times 1$ side	SUS
	PSQ0100	00013232	$\phi 100$	140	112	$\phi 100$	120			
	PSQ0125	00013233	$\phi 125$	160	160	$\phi 125$	140	4-M5 $\times 4$ side	4- $\phi 9$ $\times 1$ side	
	PSQ0150	00013234	$\phi 150$	210	174	$\phi 150$	180			
	PSQ0200	00013235	$\phi 200$	270	230	$\phi 200$	240			

Sensor for Hot Air Generator

Sheathed thermocouple which fits the length of the extension grade thermocouple wire to the optional cable for connecting the main unit and controller.

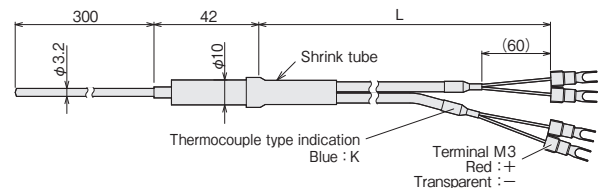


Sheathed thermocouple



2-paired sheathed thermocouple

One pair can be used for HAP controller's sensor 2 input, while another pair can be used for data logging or temperature monitoring.

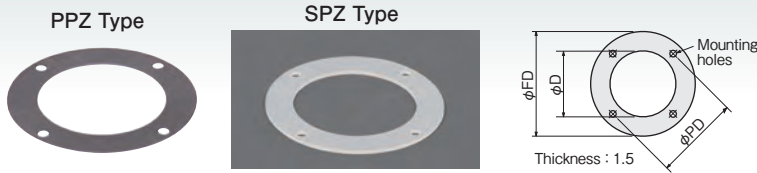


Thermocouple junction : Ungrounded
 Tolerance : Class 2 (JIS)
 Sheath material : SUS316
 Extension grade thermocouple wire : Heat resistant fiberglass braid insulation with stainless steel braided external shield

Sheathed thermocouple			2-paired sheathed thermocouple			L (mm)	Thermocouple type	Normal operating temperature limit (°C)
In stock	Model No.	Product code	In stock	Model No.	Product code			
○	ZTK003	08040245	○	WTK003	08040248	3000	K	750
○	ZTK005	08040246	○	WTK005	08040249	5000		
○	ZTK0010	08040247	○	WTK0010	08040250	10000		

HOT AIR GENERATOR OPTIONAL PARTS

Gasket Gasket for flange. Please select the material according to the application.



PPZ Type : Non-abestos joint sheet Thickness 1.5mm (Max. operating temperature: 300°C)
 SPZ Type : Silicone rubber Thickness 2mm (Max. operating temperature: 200°C)

PPZ Type			SPZ Type			Dimensions (mm)			
In stock	Model No.	Product code	In stock	Model No.	Product code	φD	φFD	φPD	Mounting hole
○	PPZ1050	00950551	○	SPZ1050	00952400	50	76	65	4 × φ6
○	PPZ1075	00950561	○	SPZ1075	00952410	73	108	96	
○	PPZ1100	00950571	○	SPZ1100	00952420	98	135	120	
○	PPZ1125	00950581	○	SPZ1125	00952430	123	154	140	
○	PPZ1150	00950591	○	SPZ1150	00952440	148	200	180	4 × φ9
○	PPZ1200	00950600	○	SPZ1200	00952450	198	260	240	

Filter joint flange



Material : Stainless steel

In stock	Model No.	Product code	Applicable models	Thickness
	PFF9002	00951715	HAP2053T	4 mm
	PFF9003	00951720	HAP2103T	5 mm

Tightening band



Hi-torque tightening band



- For fastening flexible tube. Please select according to the size of flexible tube.
- Hi-torque tightening band enables all threads on the screw to engage with the band, resulting in strong tightening force. Please use thermal insulated flexible tube or flexible tube type PLS or PGS.

Material : Stainless steel

● Tightening band

In stock	Model No.	Product code	Min ~ Max (mm)	Applicable duct size (mm)
○	PFB0044	00950400	40 ~ 82	φ50 · 75
○	PFB0064	00950410	64 ~ 114	φ75 · 100
○	PFB0080	00950420	89 ~ 140	φ100 · 125
○	PFB0096	00950430	114 ~ 165	φ125 · 150
○	PFB0175	00950432	170 ~ 200	φ175
○	PFB0200	00950434	190 ~ 220	φ200
○	PFB0250	00950435	230 ~ 260	φ250

● Hi-torque tightening band

In stock	Model No.	Product code	Min ~ Max (mm)	Applicable duct size (mm)
○	PFB5060	00950470	40 ~ 60	φ50
○	PFB5070	00950478	50 ~ 70	φ65
○	PFB5090	00950471	70 ~ 90	φ75
○	PFB5120	00950472	90 ~ 120	φ100
○	PFB5140	00950473	110 ~ 140	φ125
○	PFB5180	00950474	150 ~ 180	φ150
	PFB5200	00950475	170 ~ 200	φ175
	PFB5220	00950476	190 ~ 220	φ200
	PFB5280	00950477	250 ~ 280	φ250

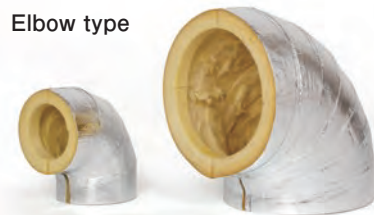
Insulation materials for duct

Thermal insulation for flexible ducts, etc

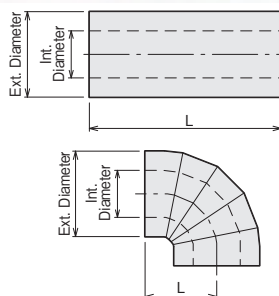
Straight type



Elbow type



- Half split shape for easy installation.
- Aluminum glass cloth covered surface for easy installation using aluminum tape.
- Can be cut for use (Straight type)



Caution

- The binder for the insulation will be burnt if use for temperatures above 150°C, resulting in smoke and foul smell. Please ventilate for the first time of use.
- The aluminum glass cloth is attached with double-sided tape for temporary fixing. Please use aluminum tape (P37) for proper installation.

Type	In Stock	Model No.	Product Code	Nominal Diameter	Dimensions (mm)			Material	Insulation Thickness	Max. operating temp.
					Int. Diameter	Ext. Diameter	L			
Straight type	○	PHJ0040	00952300	40A	49	99	1000	Rockwool with aluminum glass cloth JIS A 9504	25 mm	400°C
	○	PHJ0050	00952310	50A	61	111				
	○	PHJ0065	00952320	65A	76	126				
	○	PHJ0080	00952330	80A	89	139				
	○	PHJ0090	00952335	90A	102	152				
	○	PHJ0100	00952340	100A	114	164				
	○	PHJ0125	00952350	125A	140	190				
	○	PHJ0150	00952360	150A	165	215				
90° Elbow type		PHJ0200	00952370	200A	216	266				
	○	PHJ1040	00952301	40A	49	89	(85)	Glass wool with aluminum glass cloth	20 mm	250°C
	○	PHJ1050	00952311	50A	61	101	(95)			
	○	PHJ1065	00952321	65A	76	116	(105)			
	○	PHJ1080	00952331	80A	89	129	(114)			
	○	PHJ1100	00952341	100A	114	164	(133)			
	○	PHJ1125	00952351	125A	140	190	(149)			
○	PHJ1150	00952361	150A	165	215	(168)				



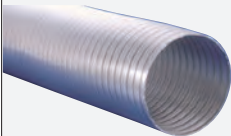
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Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

Flexible ducts

Please select by referring to the features such as maximum operating temperature or pressure rating.

Type	Shape	Material	Length
PAL		Aluminum foil with galvanized steel sheet	5 m
PAG		Aluminum foil with fiberglass cloth	5 m
PLS		Aluminum sheet	4 m

Type	Shape	Material	Length
PFA		Fiberglass cloth and stainless steel sheet	5 m
PSU		Stainless steel sheet	2 m
PGS		Silicone rubber and fiberglass cloth	2 m

PLS type can be bent easily without shape deformation. PLS type is compressed when shipped. Please stretch to use. Also, the length mentioned in this table is the stretched length.

If longer duct length is required, please join ducts to extend by using duct connector.

Type	In Stock	Model No.	Product Code	Size	Temperature Rating	Int. Diameter (mm)	Ext. Diameter (mm)	Pitch (mm)	Min. Bend Radius (mm)	Weight (g/m)	Withstand Pressure (kPa)	Withstand Decompression Pressure (kPa)
PAL	☉	PAL0050	00950314	φ 50	130°C	50.8	54.3	19	60	358	32	17
	☉	PAL0075	00950310	φ 75		75.5	79.5		80	533	25	15
	☉	PAL0100	00950311	φ 100		101.0	105		105	591	20	13
	☉	PAL0125	00950312	φ 125		126	130	23	125	736	18	
	☉	PAL0150	00950313	φ 150		152	156		150	886	15	9
	☉	PAL0200	00950315	φ 200		202	206	24	200	1114	10	6
PAG	☉	PAG0050	00950324	φ 50	180°C	50.8	55.3	20	60	400	32	17
	☉	PAG0075	00950320	φ 75		75.5	80.5		80	595	25	15
	☉	PAG0100	00950321	φ 100		101.5	106		105	670	20	13
	☉	PAG0125	00950322	φ 125		126	131	24	125	835	18	
	☉	PAG0150	00950323	φ 150		152	157		150	1010	15	9
	☉	PAG0200	00950325	φ 200		202	207	200	1260	10	6	
PLS	☉	PLS0050	00951401	φ 50	200°C	50.9	56.5	—	75	100	18	18
	☉	PLS0075	00951402	φ 75		75.9	81.5		113	130	12	12
	☉	PLS0100	00951403	φ 100		101.5	107		200	170	9	9
	☉	PLS0125	00951404	φ 125		126.4	132		250	210	7.2	7.2
	☉	PLS0150	00951405	φ 150		151.4	157		300	250	6	6
	☉	PLS0200	00951406	φ 200		201.9	209.1		400	340	4.5	4.5
PFA	☉	PFA0050	00950334	φ 50	250°C	50.8	55.3	20	60	370	18	17
	☉	PFA0075	00950330	φ 75		75.5	80.5		80	555	13	15
	☉	PFA0100	00950331	φ 100		101.0	106		105	645	10	13
	☉	PFA0125	00950332	φ 125		126	131	24	125	795		
	☉	PFA0150	00950333	φ 150		152	157		150	990	8	9
	☉	PFA0200	00950335	φ 200		202	207	200	1300	5	6	
PSU	☉	PSU0050	00950344	φ 50	400°C	50.8	53.8	20	60	350	18	21
	☉	PSU0075	00950340	φ 75		75.5	79		80	520	13	
	☉	PSU0100	00950341	φ 100		101.5	105		105	610	10	15
	☉	PSU0125	00950342	φ 125		126	129.5	24	125	760		
	☉	PSU0150	00950343	φ 150		152	155.5		150	910	8	13
	☉	PSU0200	00950345	φ 200		202	205.5	200	1210	5	9	
PGS	☉	PGS0050	00953500	φ 50	200°C	50	53	10	30	250	170	170
	☉	PGS0065	00953510	φ 65		65	68		40	350	150	150
	☉	PGS0075	00953520	φ 75		75	79		50	450	145	145
	☉	PGS0100	00953530	φ 100		100	104	12	70	650	120	120
	☉	PGS0125	00953540	φ 125		126.5	131		13	90	800	110
	☉	PGS0150	00953550	φ 150		150	155	100		1000	90	90

Caution Flexible ducts can be cut for use. Flexible ducts attached to the air outlet should be as short as possible to reduce heat and airflow losses. When ducts are connected to optional parts with nominal diameter of φ150 or φ200, the ducts may come loose due to air pressure even though it is fasten with tightening band. If the duct came loose, please use hi-torque tightening band (P42), or use connector cover (P36) of size suitable for the optional parts in use. Wrap the connector cover above the optional part and insert the duct, then fasten it using tightening band. This will make it harder for the duct to come loose.

HOT AIR GENERATOR OPTIONAL PARTS

Insulated flexible ducts

Aluminum type



Stainless steel type



Heat insulation material : Glass wool

Length : 4 m

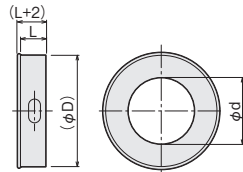
If longer length is required, please connect and extend using duct connector.

Type	In Stock	Model No.	Product Code	Size	Temperature Rating	Material	Int. Diameter (mm)	Ext. Diameter (mm)	Min. Bend Radius (mm)	Weight (g/m)	Withstand Pressure (kPa)	Withstand Decompression Pressure (kPa)
Aluminum type		PDD0050	00950360	φ 50	200°C	Aluminum alloy	50.9	107	200	470	9	9
		PDD0075	00950361	φ 75			75.9	132	300	590	7.2	7.2
		PDD0100	00950362	φ 100			101.4	157	400	720	6	6
		PDD0125	00950363	φ 125			126.4	182	500	850	5.1	5.1
		PDD0150	00950364	φ 150			151.4	209.1	600	990	4.5	4.5
		PDD0200	00950365	φ 200			201.9	259.1	800	1260	3.6	3.6
Stainless steel type		PDS0050	00950370	φ 50	450°C	SUS304	51.2	107.3	200	840	27	27
		PDS0075	00950371	φ 75			76.2	132.3	300	1100	21.6	21.6
		PDS0100	00950372	φ 100			101.7	157.3	400	1350	18	18
		PDS0125	00950373	φ 125			126.7	182.3	500	1620	15.3	15.3
		PDS0150	00950374	φ 150			151.7	209.4	600	1890	13.5	13.5
		PDS0200	00950375	φ 200			201.9	259.4	800	2430	10.8	10.8

Caution The binder for the insulation will be burnt if use for temperatures above 150°C, resulting in smoke and foul smell. Please ventilate for the first time of use.

End cap for insulated flexible duct

Cover for insulated flexible duct



Material : Stainless steel

In Stock	Model No.	Product Code	Fitting size	Dimensions (mm)		
				φ d	φ D	L
	PDD5050	00950381	φ 50	50	98	26
	PDD5075	00950382	φ 75	75	123	
	PDD5100	00950383	φ 100	100	148	
	PDD5125	00950384	φ 125	125	173	28
	PDD5150	00950385	φ 150	150	198	
	PDD5200	00950386	φ 200	200	248	

Thermal insulation jacket for duct fittings

Energy saving product that can reduce heat loss from optional parts of Hot Air Generator.



Features

- Insulation jacket for optional parts of Hot Air Generator.
- Energy saving product. By wrapping it, heat loss from the surface of optional parts can be reduced.
- Easy jacket installation by using hook-and-loop fastener.
- Maximum operating temperature is 200°C.

In Stock	Model No.	Product code	Applicable duct fitting type	Applicable models
○	PTJ0050	00971005	T-shaped duct fitting	PST0050
○	PTJ0075	00971050		PST1075/6075/7075
○	PTJ0100	00971055		PST1100/6100/7100
○	PTJ0125	00971060		PST1125/6125/7125
○	PTJ0150	00971065		PST1150/6150/7150
	PTJ0200	00971000		PST1200/6200/7200
○	PYJ0050	00971105	Wye duct fitting	PSY0050
○	PYJ0075	00971150		PSY1075
○	PYJ0100	00971155		PSY1100
○	PYJ0125	00971160		PSY1125
○	PYJ0150	00971165		PSY1150
	PYJ0200	00971170		PSY1200
○	PLJ9050	00971205	90 degrees elbow duct fitting	PSL9050
○	PLJ9075	00971250		PSL0075
○	PLJ9100	00971255		PSL0100
○	PLJ9125	00971260		PSL0125
○	PLJ9150	00971265		PSL0150
	PLJ9200	00971270		PSL0200

Shapes and sizes other than the above can be made. Please contact our sales office for more details.

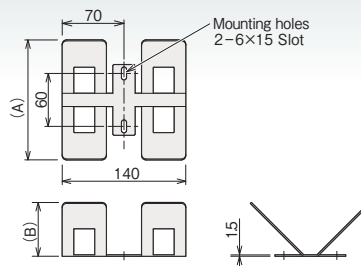
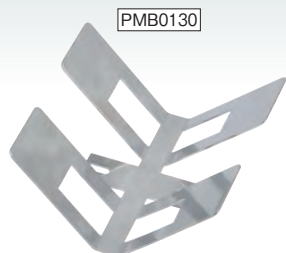
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Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

Flexible duct mounting bracket

Bracket to hold flexible duct. Flexible ducts can be install along walls or other structures with it.

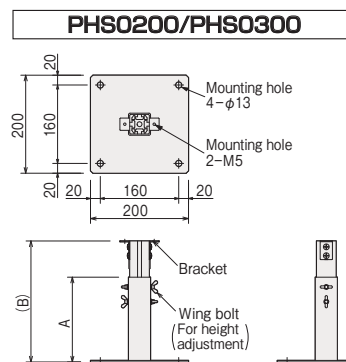
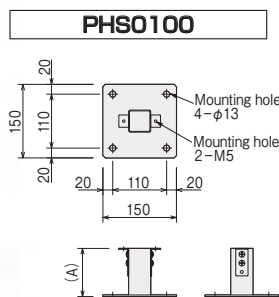


In stock	Model No.	Product code	Dimensions (mm)		Applicable flexible duct sizes	Recommended* tightening band	material
			A	B			
◎	PMB0085	00952510	88	37	φ 75~φ 100	φ 75 : PFB0044 φ 100 : PFB0064	Stainless steel
◎	PMB0130	00952520	136	61	φ 125~φ 150	φ 125 : PFB0080 φ 150 : PFB0096	

*: Tightening band is sold separately. For 1 flexible duct mounting bracket, 2 tightening band is required for use.

Flexible duct stand

Can be used in ducting to support the flexible ducts at the required height. Use in combination with flexible duct mounting bracket and tightening band.

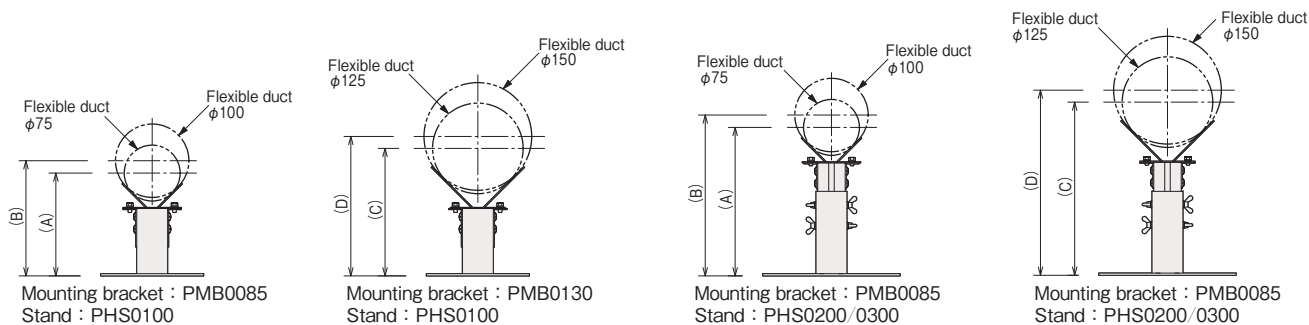


In stock	Model No.	Product code	Dimensions (mm)		Accessories *	Weight (kg)	material
			A	B			
◎	PHS0100	00953010	98/116	—	Bracket : 2 pieces	0.8	Base : Steel (heat resistant silver coating) Supporting frame : Aluminum Bracket : Stainless steel
◎	PHS0200	00953020	123	163 ~ 217	Truss screw : (M5×12) 4pieces	1.6	
◎	PHS0300	00953030	253	293 ~ 477	Hexagon bolt : (M5×8) 2pieces	2.2	

* : Flexible duct mounting bracket and tightening band are sold separately.

Flexible duct stand height adjustment range

The following height adjustment range is possible for the combination of flexible duct mounting bracket and flexible duct stand.



Example of combination usage



Flexible duct size	Mounting bracket	Height adjustment range from flexible duct center (mm)			
		Dimensions	PHS0100	PHS0200	PHS0300
φ 75	PMB0085	A	150 / 168	215 ~ 306	345 ~ 529
		B	168 / 186	232 ~ 324	363 ~ 547
φ 125	PMB0130	C	185 / 203	250 ~ 342	380 ~ 564
		D	203 / 221	268 ~ 360	398 ~ 581

HOT AIR GENERATOR OPTIONAL PARTS

Combination table for Hot Air Generator

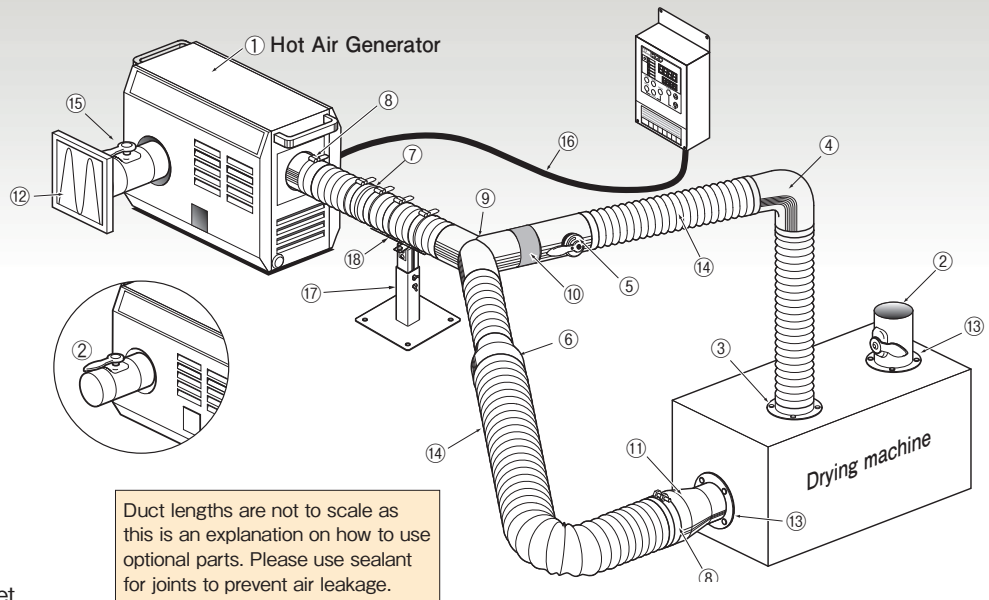
Please use the following combination to support the flexible ducts from the height of the air inlet or air outlet of the respective Hot Air Generator.

Hot Air Generator	Applicable flexible duct sizes	Applicable products				
		Mounting bracket	Tightening band	Stand on air inlet side	Stand on air outlet side	
2000 Series	3 ~ 7.5 kW	φ 75	PMB0085	PFB0044	PHS0100	PHS0200
	8, 10kW	φ 100		PFB0064		
	15, 20kW	φ 125	PMB0130	PFB0080	PHS0200	PHS0300
	30, 40kW	φ 150		PFB0096		
	HAP2053T*	φ 100 (Air inlet)	PMB0085	PFB0064	PHS0100	—
		φ 75 (Air outlet)		PFB0044	—	PHS0200
HAP2103T*	φ 125 (Air inlet)	PMB0130	PFB0080	PHS0200	—	
	φ 100 (Air outlet)	PMB0085	PFB0064	—	PHS0300	
3000 Series	HAP3051	φ 75	PMB0085	PFB0044	—	PHS0300
	HAP3101	φ 100		PFB0064		
HAP1113		φ 75	PMB0085	PFB0044	PHS0100	PHS0200

* Please use filter joint flange for the air inlet of HAP2053T, HAP2103T.

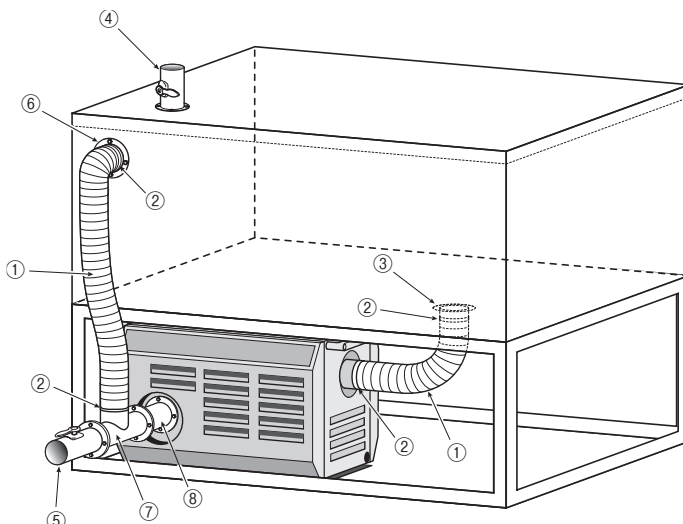
How to use optional parts

- ① Hot Air Generator
- ② Single flange damper
- ③ Flange duct connector
- ④ Duct fitting (90° elbow)
- ⑤ Damper
- ⑥ Reducer
- ⑦ Duct connector
- ⑧ Tightening band (please use for all connecting parts)
- ⑨ Duct fitting (Wye)
- ⑩ Connector cover
- ⑪ Single flange reducer
- ⑫ Air inlet filter
- ⑬ Gasket
- ⑭ Flexible duct
- ⑮ Double flange damper
- ⑯ Optional cable
- ⑰ Flexible duct stand
- ⑱ Flexible duct mounting bracket



Example of optional parts usage for hot air recirculation

Efficient heating by using hot air recirculation.



- ① Flexible duct
- ② Tightening band
- ③ Flange duct connector
- ④ Flange damper (For exhaust air adjustment)
- ⑤ Flange damper (For suction air adjustment)
- ⑥ Flange duct connector
- ⑦ Duct fitting (Flange T-shaped duct fitting Type-A)
- ⑧ Double flange duct connector

◆ Precautions when using hot air recirculation

- (1) Exhaust air outlet should be the same size or larger than supply air outlet.
- (2) The length of flexible ducts or fittings should be as short as possible, with as few bends as possible.
- (3) Fresh air intake should be made possible for ducting.
- (4) Installing exhaust air outlet for moisture drying while partially taking in fresh air will provide better efficiency.
- (5) High temperatures are expected on the parts surrounding the ducting and exhaust. Please be cautious about burns and other hazards. Installing insulation for ducts will improve safety as well as the efficiency of heating.

Power meter for Hot Air Generator

Power meter for HAP2000(F,T), 3000 series and 100V Hot Air Generator

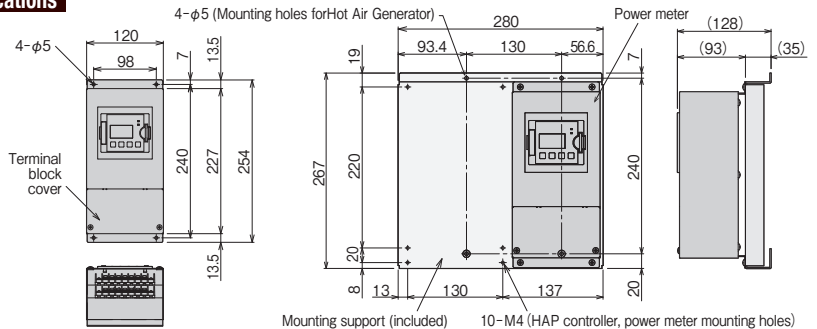
Features

- Allows power consumption logging when used in combination with Hot Air Generator.
- Contributes to energy saving by "visualization" of the power consumption for Hot Air Generator.
- Power consumption, current, voltage, load energize time and others can be measured.
- Easy management of measurement data with the use of SD memory card (commercial product).

Can be shipped with it assembled to the Hot Air Generator. (Refer page 49)



Dimensions & Specifications



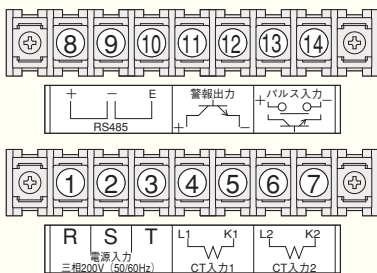
In stock				
Model No.	HAU2031	HAU2153	HAU2480	HAU1100
Product code	00891010	00891020	00891030	00891040
Power supply voltage	3P 200V (50 / 60Hz)			100V (50 / 60Hz)
Applicable Hot Air Generator power rating	3~10kW	15~30kW	40~80kW	1.2kW (HAP1113)
CT	Rated current for primary winding (no. of CT(s))	50A (2 pieces)	100A (2 pieces)	250A (2 pieces)
	CT cable	MVVS 2core×0.75mm ² ×4m×2		
Main items for measurement	File type 1	(Instantaneous value) Integrated electric power, Instantaneous electric power, Current, Voltage		
	File type 2	(Differential value) Integrated electric power		
	File type 3	(Instantaneous detailed value) Integrated electric power, Instantaneous electric power, Current, Voltage, Load energize time		
Logging interval	File type 1, 2	60min fixed (00min of every hour)		
	File type 3	Select from 1, 5, 10, 15, 30, 60min		
External storage medium	SDmemory card*2 (Supported format: SD or SDHC standard compliant)			
Reference for logging volume	Approximately 5days/MB when writing for all files (Instantaneous detailed value: logging interval 1min)			
Power cable	2PNCT 3core×0.75mm ² ×4m		2PNCT 2 core×0.75mm ² ×4m Plug attached (included: relay cables for CT attachment)	
Operating environment	Ambient temperature : 0 ~ 40°C Relative humidity : Below 80% RH (Provided that no condensation occurs)			

* 1 : File type to write into SD memory card can be selected in the settings.

* 2 : SD memory card is not included.

(The specifications of the power meter is extracted from Panasonic eco-Power Meter KW1M-H7's user manual (ARCT1F497-7))

Terminal block connection diagram



Terminal block screw size : M4

Recommended crimping terminal : R1.25-4 (JIS C2805)

①②③ Power input :

Please wire in parallel with the power supply cable for the Hot Air Generator.

④~⑦ CT input 1, 2 :

Please attach the CT to the R, T power phase of the Hot Air Generator.

⑧⑨⑩ RS485 serial communication (+, -, E) :

Wire to dedicated device for wired measurement data collection.

⑪⑫ Alarm output (+, -) :

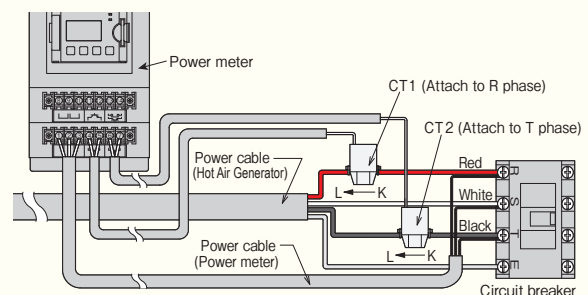
Outputs alarm according to the settings for exceeded integrated electric power, current or idle electric power.

⑬⑭ Pulse input (+, -) :

For counting of pulse output from other devices. (Contact/No contact)

Connection example

- Connect the power and CT cables to the respective terminals on the terminal block ①~⑦ of the power meter.
- Wire the power meter's power cables in parallel on the circuit breaker for the Hot Air Generator. During this, please align and wire the green cables together for the Hot Air Generator and power meter's power cables.
- Attach CT1 and CT2 respectively to the Hot Air Generator's power cable R phase (red wire) and T phase (black wire).
- Please attach so that the CT arrow direction (L direction) is on side to the Hot Air Generator.



HOT AIR GENERATOR OPTIONAL PARTS

Program controller

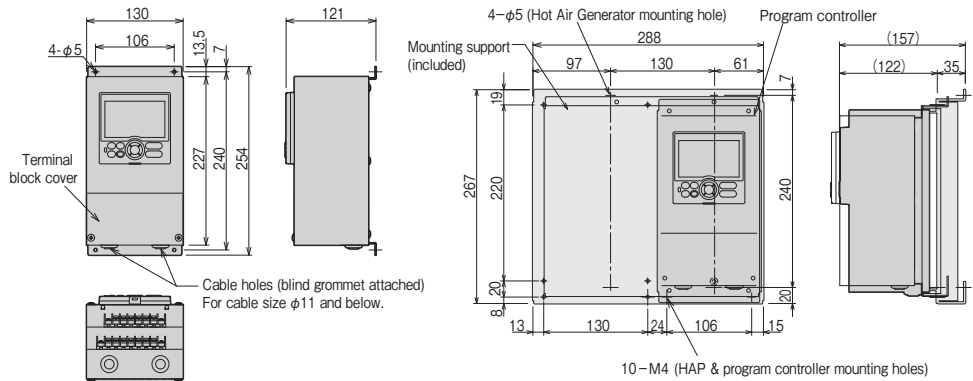
Program controller for HAP2000(F,T), 3000 series and 100V Hot Air Generator



Features

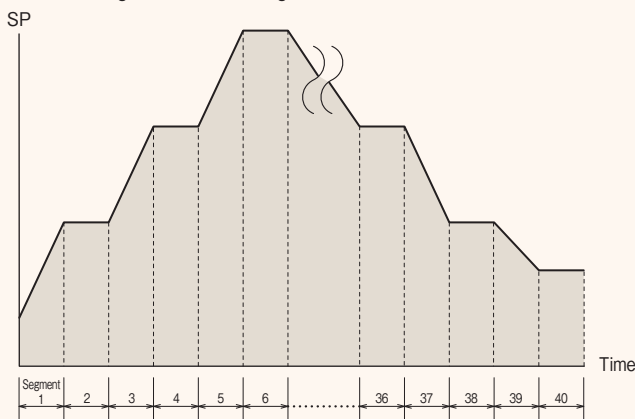
- Program controller with 4 pattern and total number of 40 segments. Allows more complex programmed operation when used in combination with the Hot Air Generator.
- The program can output end signal for temperature alarm, temperature reach signal.
- Event input terminal can be added for build to order items. (Enables external operation/stop, program pattern switching, operation mode switching etc.)

Dimensions & Specifications



Program operation explanation

- Operation (programmed operation) with varying SP value (temperature settings) as in the figure below is possible with the use of TSP (temperature set points) with a maximum of 40 segments (per pattern).
- For each segment, TSP and segment time can be set.

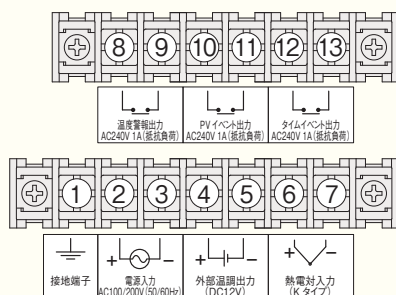


In stock	
Model No.	HAT2000
Product code	00901000
Power supply voltage	1P 100 ~ 240V (50/60Hz)
Control output	Voltage pulse output On voltage : DC12V
Event output	3 points (relay output)
Sensor input	Thermocouple : K (J, T, B, S, R, N, E)*1
Program pattern	4
Total No. of segment	40
Control	PID control or ON/OFF control (with auto-tuning)
Display	14 segment (PV display) digital display
Operating environment	Ambient temperature : 0 ~ 40°C Relative humidity : Below 80% RH (Provided that no condensation occurs)

*1 : Build to order item is supported for use with thermocouple other than K-type.

Can be shipped with it assembled to the Hot Air Generator. (Refer page 49)

Control terminal block connection diagram



Terminal block screw size : M4
Recommended crimping terminal : R1.25-4 (JIS C2805)

- ① Earth terminal :**
Please wire cable for grounding.
- ②③ Power supply input :**
Supply power to the main device by inputting external power supply (1P 100 ~ 240V).
- ④⑤ External temperature control output (+, -):**
Hot Air Generator temperature control by inputting this device's SSR signal (DC12V) to the HAP controller's external temperature control input.

- ⑥⑦ Thermocouple input (+, -):**
Temperature control using this device by inputting temperature sensor (K-type grounded).
- ⑧⑨ Temperature alarm output :**
Contact output will be ON where there is an error for the temperature control using the thermocouple connected to ⑥⑦ , irrespective of operation mode.
(AC240V 1A, resistance load, initial settings: close when error occurs)
- ⑩⑪ PV / Local event output :**
For PV event, during programmed operation with temperature control using thermocouple connected to ⑥⑦ , contact output will be turned ON when the display temperature of the thermocouple satisfies the event condition. For local event, during local operation with temperature control using thermocouple connected to ⑥⑦ , contact output will be turned ON when the display temperature of the thermocouple satisfies the event condition.
(AC240 1A, resistance load, initial settings: close when event occurs)
- ⑫⑬ Time event output :**
During programmed operation, a clock starts when the operation begins for each segment. When the clock reaches the time that was set, the contact output will be OFF if it is set to ON at the beginning of the segment. Similarly, the contact output will be ON if it is set to OFF at the beginning of the segment.
(AC240 1A, resistance load, initial settings: close when event occurs)

How to order Hot Air Generator assembled with power meter or program controller

Shipment with the power meter or program controller assembled to the Hot Air Generator is possible.
Please specify the model No. and product code when placing order.

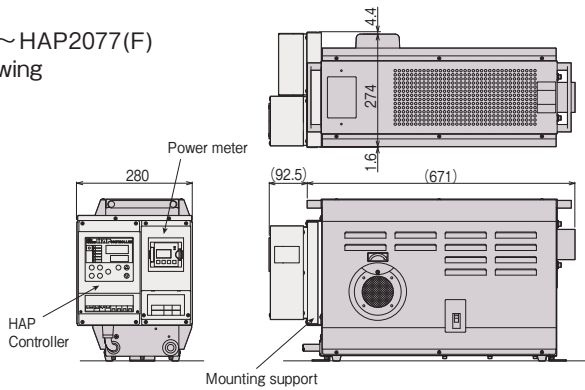
● How to order Hot Air Generator assembled with power meter

"Model no. of standard item Hot Air Generator" – PW

● For shipping with the power meter assembled...

- Wiring for Hot Air Generator to power meter is done.
[Terminal ①, ②, ③ of power meter are used]
 - CT wiring for Hot Air Generator is done.
[Terminal ④, ⑤, ⑥, ⑦ of power meter are used]
- ※ Please refer to control terminal block connection diagram for terminal block number.

HAP2032(F) ~ HAP2077(F)
Assembly drawing



Model No. (Standard item model no. -PW)	Product code
HAP2032 -PW	00000291
HAP2052 -PW	00000293
HAP2077 -PW	00000295
HAP2082 -PW	00000297
HAP2102 -PW	00000299
HAP2152H -PW	00000301
HAP2202H -PW	00000303
HAP2302H -PW	00000305
HAP2403H -PW	00000307
HAP2601 -PW	00000309
HAP2801 -PW	00000311
HAP2053T -PW	00000313
HAP2103T -PW	00000314
HAP2032F -PW	00000292
HAP2052F -PW	00000294
HAP2077F -PW	00000296
HAP2082F -PW	00000298
HAP2102F -PW	00000300
HAP2152HF -PW	00000302
HAP2202HF -PW	00000304
HAP2302HF -PW	00000306
HAP2403HF -PW	00000308
HAP2601F -PW	00000310
HAP2801F -PW	00000312
HAP3051 -PW	00000477
HAP3101 -PW	00000478
HAP1113 -PW	00000481

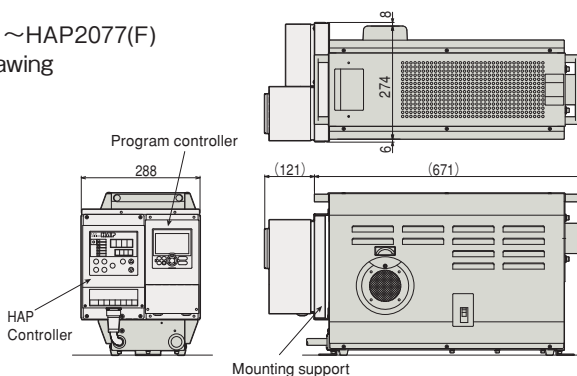
● How to order Hot Air Generator assembled with program controller

"Model no. of standard item Hot Air Generator" – PR

● For shipping with the program controller assembled...

- Wiring is done for program controller input power supply (power supply is taken from the Hot Air Generator unit).[Program controller's terminal block no.:②, ③ are used.]
 - Program controller's external temperature control output is wired to the HAP controller's external temperature control input. [Program controller's terminal block no.:④, ⑤ are used.]
 - Please wire the other terminals [terminal block no.:①, ⑥, ⑦, ⑧~⑬] and set the program settings. Also, thermocouple for the program controller is not included, please select from the sensors for Hot Air Generator (page 41).
- ※ Please refer to control terminal block connection diagram for terminal block number.

HAP2032(F) ~ HAP2077(F)
Assembly drawing



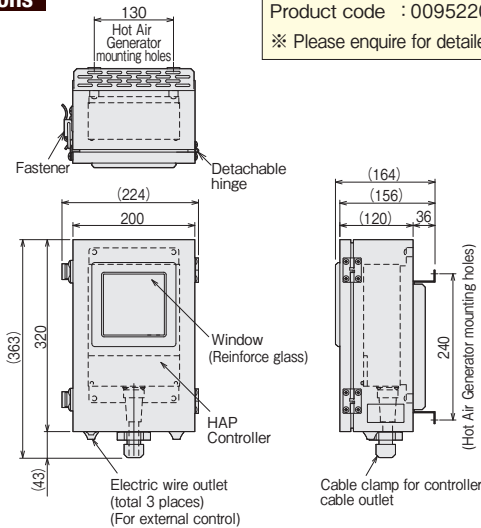
Model No. (Standard item model No. -PR)	Product code
HAP2032 -PR	00000271
HAP2052 -PR	00000273
HAP2077 -PR	00000275
HAP2082 -PR	00000277
HAP2102 -PR	00000279
HAP2152H -PR	00000281
HAP2202H -PR	00000283
HAP2302H -PR	00000285
HAP2403H -PR	00000287
HAP2053T -PR	00000289
HAP2103T -PR	00000290
HAP2032F -PR	00000272
HAP2052F -PR	00000274
HAP2077F -PR	00000276
HAP2082F -PR	00000278
HAP2102F -PR	00000280
HAP2152HF -PR	00000282
HAP2202HF -PR	00000284
HAP2302HF -PR	00000286
HAP2403HF -PR	00000288
HAP3051 -PR	00000479
HAP3101 -PR	00000480
HAP1113 -PR	00000482

HAP controller dust-proof box



This product does not support discontinued models for Hot Air Generator. For discontinued models, please use the following product.
 Model No. : PBC0200
 Product code : 00952200
 ※ Please enquire for detailed specifications.

Dimensions



Features

- Protects the HAP controller from dust, useful for longer life.

Precautions for use

- This product is dust protection for the HAP controller only.
- It is not for dust protection for the Hot Air Generator unit.
- For dust protection of the Hot Air Generator unit, please use dust-proof cover (page 51) or dust-proof Hot Air Generator (build to order item).
- If Hot Air Generator is used in recirculation mode, please use with suction air temperature at 150°C and below.
- It is not explosion proof. Do not use in atmosphere where explosive or flammable gases are present.
- It is not waterproof.
- HAP controller is not included.

Specifications

In stock	
Model No.	PBC0201
Product code	0000485
IP class	IP4X equivalent
Accessories	Spacer for handle*, screws
Operating environment	Ambient temperature : 0~40°C Relative humidity : Below 80% RH (Provided that no condensation occurs)

* : Spacer for handle is for use when assembling to HAP2032(F)~HAP2102(F), HAP2053T, HAP1113.

Hot Air Generator booster

Build to order

Heater unit for further heating of the hot air from the Hot Air Generator.



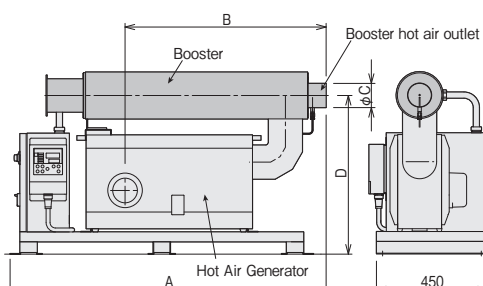
Features

- Heater unit used to further heat the hot air from Hot Air Generator. Installed to the Hot Air Generator's outlet.
- Temperature control of maximum 500°C*1*2 at the air outlet of the booster is possible. For HAP2032 (F)~HAP2102 (F) in 2000 series, the booster can be assembled to top of the Hot Air Generator, so that a single compact unit can be made possible. For other models, it is installed separately from the Hot Air Generator. (Please enquire for details)

* 1 : The booster's air outlet maximum temperature depends on the conditions of airflow and the use of hot air recirculation.

* 2 : For hot air recirculation, the Hot Air Generator's air intake temperature should be within the specified suction air temperature range.

Dimensions & specifications



Nominal diameter	Air outlet diameter	Max. heater capacity manufacturable	Booster's max. control temperature	Applicable models	A	B	C	D
φ 75	φ 73	5 kW	500°C	HAP(F)/HAS 2032~2077	1106	660	73	620
φ 100	φ 98	8 kW	500°C	HAP(F)/HAS 2082~2102	1281	815	98	643

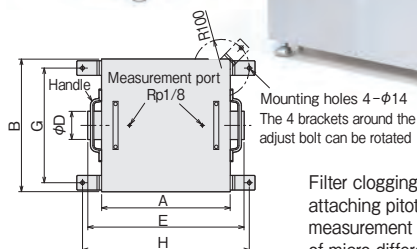
(Note) The above dimensions (A~D) is for reference only.

For types separated from Hot Air Generator, larger items can be manufactured.

For separated types, independent controllers that can interlock the operation of the booster and the Hot Air Generator can be manufactured.

Clean filter

HEPA filter unit for Hot Air Generator



Filter clogging can be checked by attaching pitot tube to the measurement port and with the use of micro differential pressure gauge.

(Pitot tube and micro differential pressure gauge are optional parts)

Optional part model no. PHF2000



※ PHF0075 and PHF0100 are not attached with caster or handle.

● Replacement filter

In stock	Model No.	Product code	Applicable models
	PHF1035	00951970	PHF0075 / 0100
	PHF1050	00951980	PHF0125 / 0150

● Micro differential pressure gauge

In stock	Model No.	Product code	Applicable models
	PHF2000	00951990	All models

A set with 4 items that are micro differential pressure gauge, pitot tube (2 pieces), connecting hose of 1m length and bracket for the gauge installation.

- HEPA filter unit that can provide clean hot air, and can be easily connected to the Hot Air Generator (HAP2000(F)/HAS2000 series) using connector socket (page 36) or flexible ducts (page 43).
- Gas connecting parts are made of stainless steel, therefore it is clean and has excellent durability.
- Comes with thermal insulated layer for safer use and lower heat loss.
- Can be used for recirculation of maximum 200°C.

In stock		PHF0075	PHF0100	PHF0125	PHF0150
Model No.		PHF0075	PHF0100	PHF0125	PHF0150
Product code		00951910	00951920	00951930	00951940
Nominal diameter		φ 75	φ 100	φ 125	φ 150
Dimensions (mm)	A	463		613	
	B	463		613	
	C	500		650	
	φ D	73	98	123	148
	E	562		712	
	F (Adjustable)	275 ~ 350		395 ~ 490	
	G *1	(400)		(550)	
	H *1	(600)		(750)	
Operating fluid	Air				
Max. operating temperature	200°C				
Max. airflow	8.5 m ³ /min		27.5 m ³ /min		
Filtration efficiency*2	99.97% at 0.3 μm				
Initial pressure drop (at rated airflow)	249 ± 20 Pa				
Final pressure drop	498Pa				
Operating environment	Indoor use only 0 ~ 40°C below 80%RH (provided that no condensation occurs)				
Material of gas connecting parts	SUS304				
Material of casing	SPCC (Baked finish)				
Weight	32 kg		69 kg		

※ 1 : The bracket around the adjust bolt can be rotated with a radius of R=100.

※ 2 : Value of the filter alone.

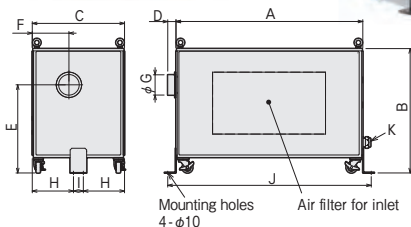
Reference data (experimental value)

Air volume loss when attached to Hot Air Generator (at frequency of 50/60Hz)

Model No.	Applicable models	Air volume loss
PHF0075	HAP / HAS 2032~2077	13~14 %
PHF0100	HAP / HAS 2082·2102	5~6 %
PHF0125	HAP / HAS 2152·2202	8~9 %
PHF0150	HAP / HAS 2302H·2403H	6~7 %

Dust-proof cover

Dust-proof cover dedicated for HAP2000(F) series



Material : Steel (coated)

Air filter for inlet specifications (Same for all models)

Filter material : Polyester (14mm) made by Japan Vilene Company, LTD.

Filtration efficiency : 76% (Particles of 25 μm)
100% (Particles of 50 μm)

Air volume loss due to pressure drop : less than 3%

- This product is not for hot air recirculation operation use.
- A small transparent acrylic window can be opened to operate the controller.
- Airflow can be adjusted with the controller for HAP2000F series.
- The cover has to be removed to adjust the airflow for HAP2000 series. If frequent airflow adjustment is required, please use damper or other parts to adjust the airflow at the air outlet.

Features

- Protects the Hot Air Generator from dust, useful for longer Hot Air Generator life.

Precautions for use

- It is not explosion proof. Do not use in atmosphere where explosive or flammable gases are present.
- It is not waterproof. Please install it indoors, at locations where there is no exposure to water.
- Depending on the operating environment, clean and inspect the hot air generator inside the cover at appropriate intervals.

In stock		PBR2075	PBR2100	PBR2150	PBR2200	PBR2400
Model No.		PBR2075	PBR2100	PBR2150	PBR2200	PBR2400
Product code		00952210	00952230	00952240	00952250	00952260
Dimensions (mm)	A	805	906	1135		1252
	B	557		758		880
	C	386	420	560		716
	D	45		50		
	E	397		535		623
	F	178		222		338
	G	φ 73	φ 98	φ 123	φ 148	
	H	173	190	250		328
	I	40		60		
	J	906	998	1236		1352
K (Suitable cable ext. Diameter)	φ 11~20		φ 18~31.5	φ 24~38.5	φ 35~47.5	
Weight	30 kg	33 kg	43 kg		53 kg	
Applicable Hot Air Generator	HAP2032 (F) HAP2052 (F) HAP2077 (F)	HAP2082 (F) HAP2102 (F)	HAP2152H (F)	HAP2202H (F)	HAP2302H (F) HAP2403H (F)	

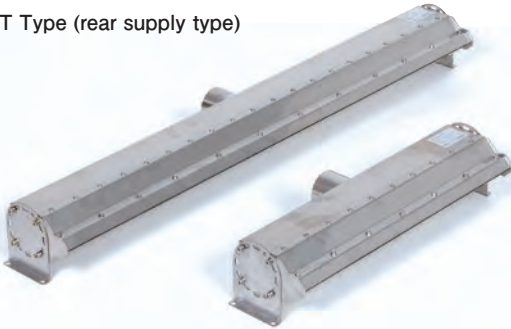
HOT AIR GENERATOR OPTIONAL PARTS

Air curtain Nozzle to supply air in an elongated uniform manner S type for side supply / T type for rear supply

S Type (side supply type)



T Type (rear supply type)



Features

- Made of stainless steel (SUS304) material, therefore it is clean and has excellent durability.
- With Hakko's unique designed inner structure, a balanced slit air speed of $\pm 5\%$ can be achieved, in addition pressure drop is also kept low. (excluding 25mm from the sides of both ends)
- Slit width is easily adjustable. (adjustable to a max. of 2mm)
- Powerful air curtain can be achieved by combining it with vortex flow blower or multistage turbo blower.
- Can be used as a hot air curtain by combining it with Hakko Hot Air Generator.

Applications

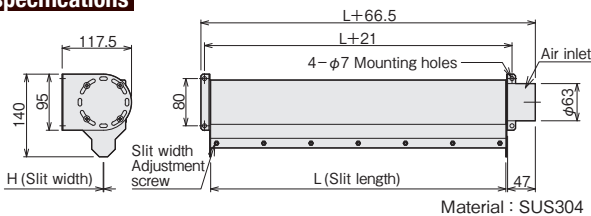
- Water removal / drying after wash
- Air curtain / air shower
- Removal / prevention of condensation

Precautions for use

- When installing ducts, please use tightening band or other parts to securely fasten it.
- When air curtain is used for hot air, please do not go near the unit or air outlet as there is risk for burns.

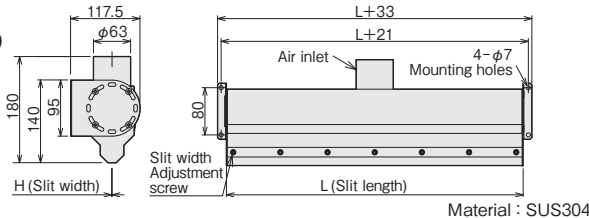
Dimensions & specifications

● S Type (side supply type)



Material : SUS304

● T Type (rear supply type)



Material : SUS304

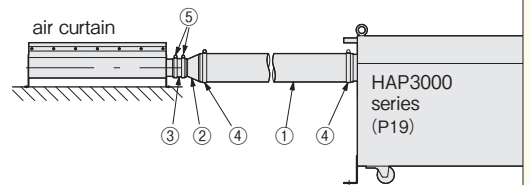
S Type (side supply type)			T Type (rear supply type)			Dimensions (mm)		Max. operating temperature	Weight (kg)
In stock	Model No.	Product code	In stock	Model No.	Product code	*1	*2		
	AIC0500	00951510		AIB0500	00951515	500	1	300°C and below	3.4
	AIC1000	00951520		AIB1000	00951525	1000	1		
	AIC1500	00951530		AIB1500	00951535	1500	1		

- * 1 : Lengths other than the above can be made. (max. 1500L)
- * 2 : Slit width is adjustable between 0.5-2mm. (1mm when shipped)

Example of connecting to Hot Air Generator

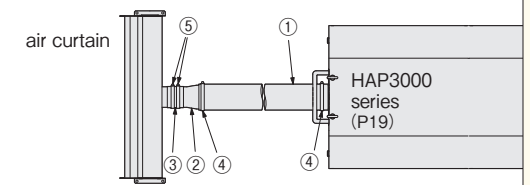
- ① Flexible duct
 - ② Reducer
 - ③ Connector cover
 - ④ ⑤ Tightening band
- Refer P34-43 for ①~⑤

S Type (side supply type)



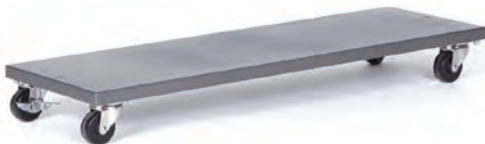
T Type (rear supply type)

A wider air curtain is possible by using multiple T Type side by side.

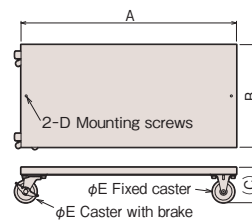


When connecting to high static HAP3000 series, the use of high withstand pressure flexible duct PGS type and hi-torque tightening band are recommended.

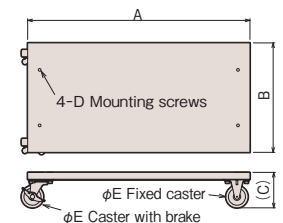
Caster for Hot Air Generator



● PCH1100



● PCH2076 / PCH2101 / PCH2200 / PCH2400



- Caster for various Hot Air Generator can be made. Please order for applications where the Hot Air Generator will be moved frequently.
- Can be shipped with it assembled to the Hot Air Generator.

Caster for HAP2053T can be build to order. Please enquire for details.

In stock	Model No.	Product code	Weight (kg)	Dimensions (mm)					Applicable models
				A	B	C	D	E	
	PCH2076	00000486	9	650	300	104	M6	φ65	HAP2032 (F) ~ HAP2077 (F) HAS2032 ~ HAS2077
	PCH2101	00000487	10	750	340	114	M6		HAP2082 (F) / HAP2102 (F) HAS2082 / HAS2102
	PCH2200	00954520	21	970	420	125	M8	φ75	HAP2152H (F) / HAP2202H (F) HAS2152H / HAS2202H / HAP2103T
	PCH2400	00954530	24	1120	460	135	M10		HAP2302H (F) / HAP2403H (F) HAS2302H / HAS2403H
	PCH1100	00954540	8	520	300	104	M6	φ65	HAP1113

HEAT EXCHANGER Heat exchanger for Hot Air Generator (Gas × Gas)

Cross pile heat exchanger

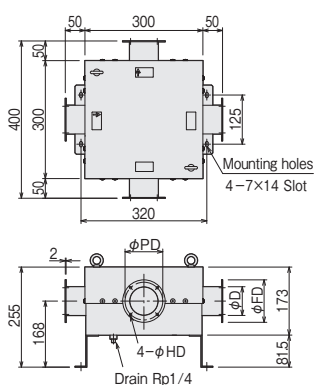


Features

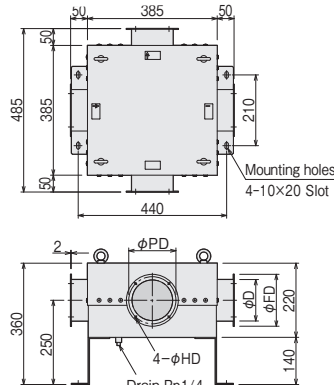
- Recovers heat from exhaust for energy savings.
- Clean hot air can be obtained as the air for high temperature side is not mixed with low temperature side.
- Small in size, can be installed afterwards in between ductings.
- Prevents room temperature rise by reducing the exhaust air temperature.
- Can be used for high airflow.
- Body material is made of stainless steel (SUS304), therefore it has excellent durability.
- Comes with thermal insulated layer for safer use and lower heat loss.
- Maximum operating temperature of 300°C.

Dimensions & specifications

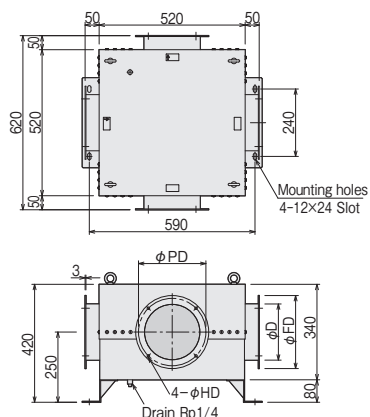
■ CEX2075 / CEX2100



■ CEX2125 / CEX2150



■ CEX2200



Precautions for use

- Please follow the indicated flow direction (high temperature side, low temperature side) on the unit when performing duct installation.
- Make sure to supply air to the low temperature side when supplying air to the high temperature side.
- Please use it under the withstand pressure.
- Please conduct regular maintenance so that the heat exchanger can maintain its original performance.
- Please be cautious so that the temperature of the low temperature air outlet does not exceed the temperature range of air intake for the Hot Air Generator.
- Please install so that the drain faces downwards.

In stock					
Model No.	CEX2075	CEX2100	CEX2125	CEX2150	CEX2200
Product code	00550010	00550020	00550030	00550040	00550050
Nominal diameter	φ75	φ100	φ125	φ150	φ200
Dimensions (mm)	φD	73	98	123	148
	φFD	108	135	154	200
	φPD	96	120	140	180
	HD	6	6	6	9
Temperature efficiency *1	Average 40%				
Heat exchanger type	Cross-flow plate type *2				
Operating fluid	Air				
Max. operating temperature	300°C				
Nominal airflow *3	1.7 m³/min		4.1 m³/min		13.5 m³/min
Pressure loss (reference value)	440 Pa				450 Pa
Withstand pressure	100 kPa				
Body material	SUS304				
Weight	Approximately 20 kg		Approximately 40 kg		Approximately 95 kg
Applicable models	HAP(F) or HAS 2032 / 2052 / 2077	HAP(F) or HAS 2082 / 2102	HAP(F) or HAS 2152 H / 2202 H	HAP(F) or HAS 2302 H / 2403 H	HAP(F) or HAS 2601 / 2801

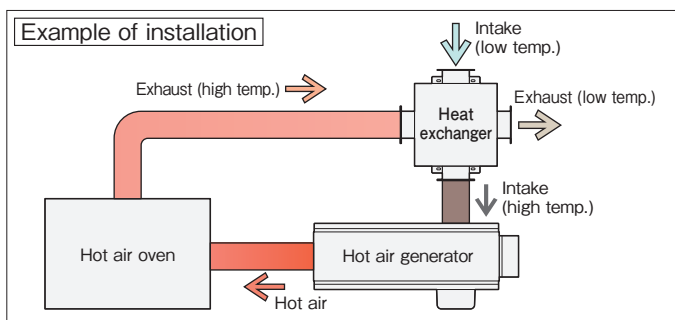
*1: Temperature efficiency varies with airflow and intake air temperature.

*2: Counter-flow type can be made.

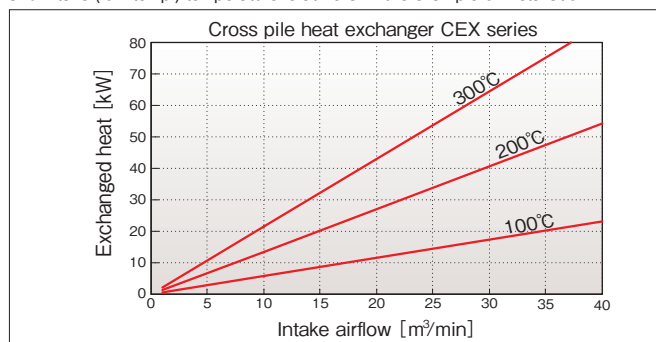
*3: Nominal airflow at 20°C and 1atm. May be used in conditions which exceeds these values, but temperature efficiency will decrease.

Performance characteristics

Performance characteristics are values obtained from our test results and calculations, it may not be the same depending on the operating environment.



Exchanged heat is when exhaust (high temp.) temperatures are 100°C, 200°C, 300°C, and intake (low temp.) temperature is at 25°C in the example of installation.



High-efficiency heat exchanger

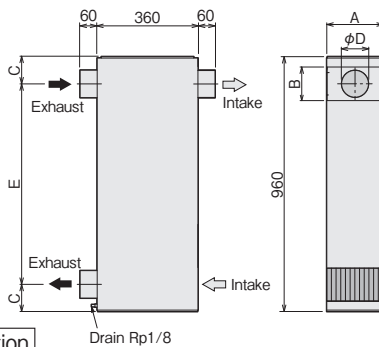
Features

- Recovers heat from exhaust for energy savings.
- Clean hot air can be obtained as the air for high temperature side is not mixed with low temperature side.
- Can be installed afterwards in between ductings.
- Prevents room temperature rise by reducing the exhaust air temperature.
- A highly efficient heat exchanger with an average heat exchange rate of 70%.
- Maximum operating temperature of 150°C.
- Highly efficient heat recovery is possible even for low temperature exhaust.

Precautions for use

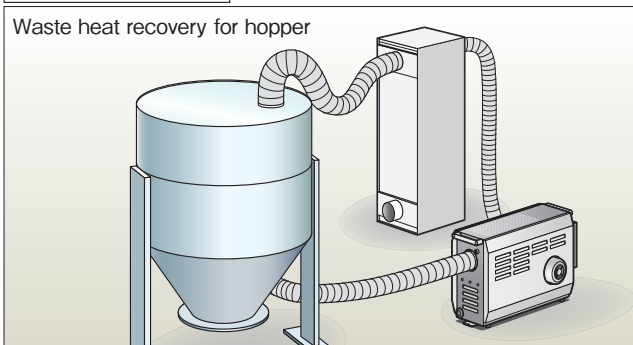
- Please follow the indicated flow direction (high temperature side, low temperature side) on the unit when performing duct installation.
- Make sure to supply air to the low temperature side when supplying air to the high temperature side.
- Please use it under the withstand pressure.
- Please conduct regular maintenance so that the heat exchanger can maintain its original performance.
- Please be cautious so that the temperature of the low temperature air outlet does not exceed the temperature range of air intake for the Hot Air Generator.
- Please be cautious of burns as the temperature on top of the unit will be high.

Dimensions & specifications



Example of application

Waste heat recovery for hopper



In stock				
Model No.	TEX1075	TEX1100	TEX1125	
Product code	00550110	00550120	00550130	
Nominal diameter	φ 75	φ 100	φ 125	
Dimensions (mm)	φ D	73	98	123
	A	105	205	305
	B	120	120	135
	C	92	92	107
	E	776	776	746
Temperature efficiency*1	Average 70%			
Heat exchanger type	Counter-flow plate type			
Operating fluid	Air			
Max. operating temperature	150°C			
Airflow *2	3m ³ /min	6m ³ /min	9m ³ /min	
Pressure loss	100Pa (reference value)			
Body material	SUS304 (Aluminum heat exchange plate)			
Weight (Approximately)	14kg	23kg	33kg	
Applicable models	HAP(F) or HAS 2032 / 2052 / 2077 / HAP or HAS 4530 / 4550 / HAP1113	HAP(F) or HAS 2082 / 2102	HAP(F) or HAS 2152H / 2202H	

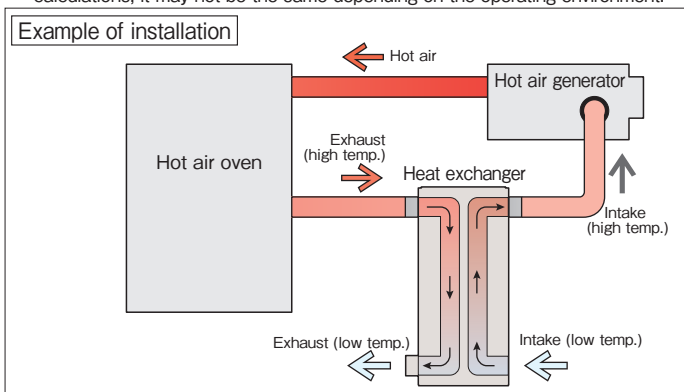
* 1 : Temperature efficiency varies with airflow and intake air temperature.

* 2 : Airflow at 20°C and 1atm.

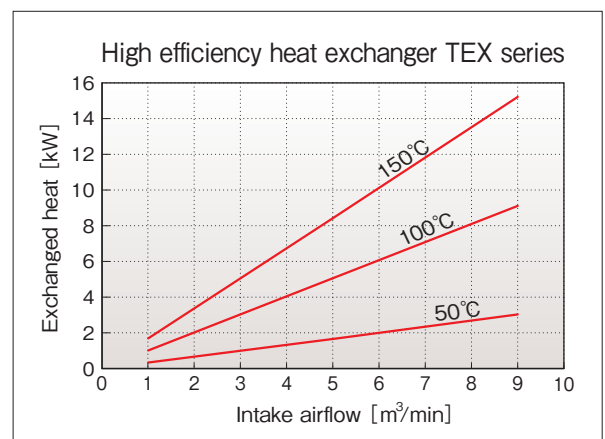
Performance characteristics

Performance characteristics are values obtained from our test results and calculations, it may not be the same depending on the operating environment.

Example of installation



Exchanged heat is when exhaust (high temp.) temperatures are 50°C, 100°C, 150°C, and intake (low temp.) temperature is at 25°C in the example of installation.



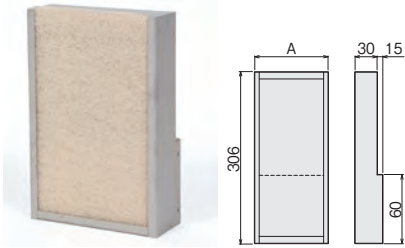
No sign : [Build-to-order]

Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

High efficiency heat exchanger optional parts

Air inlet filter



Use by attaching it to the air inlet.
Filter part is washable.

In stock			
Model No.	TEX2075	TEX2100	TEX2125
Product code	00952825	00952830	00952835
A dimension	100	200	300
Applicable model	TEX1075	TEX1100	TEX1125

Body and frame material : Stainless steel

Filter material : Polyester (14mm)
made by Japan Vilene Company, LTD.

Filtration efficiency : 76% (Particles of 25 μ m)
100% (Particles of 50 μ m)

Replacement filter (filter media)

In stock			
Model No.	PFR5075	PFR5100	PFR5125
Product code	00952840	00952845	00952850
Size (Height \times Length)	100 \times 300	200 \times 300	300 \times 300
Applicable model	TEX2075	TEX2100	TEX2125

Thermal insulation cover

Surface: Aluminum cloth

Insulation material:
Glass wool (25mm)

Max. operating temperature:
100 $^{\circ}$ C



Thermal insulation cover

In stock			
Model No.	TEX3075	TEX3100	TEX3125
Product code	00952810	00952815	00952820
Applicable model	TEX1075	TEX1100	TEX1125

SIMPLE HOT AIR OVEN TENT

Build to order

Simple and convenient drying oven that can be moved or stored.

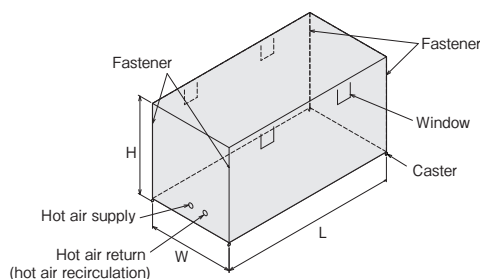


Features

- Easy setup and installation** Can be setup in about an hour. Possible to be setup with a minimum of 2 person. (Time for setup varies depending on size and number of persons)
- Can be stored** The tent is simple to setup, hence it can be stored when not in use.
- Free to move** As the tent is attached with casters, it can be moved freely.
- Easy operation** Easy operation by just connecting Hot Air Generator HAP series to the tent. (Optional parts may be required depending on the layout of duct connections)
- Affordable pricing** Cost is much lower than conventional fixed oven of the same size. Ideal for drying and heating at relatively low temperatures.
- Abundant colors** Various colors for the fabric are available, please feel free to consult us.

Applications

- Preheat or drying of large parts
- Drying of laundry for various work places
- Preheat or drying of food products, etc



Dimensions and shape other than the listed can be made. Please enquire for details.

Fabric material:
Fire retardant polyester

Frame material: Steel pipe

Precautions for use

- Separate sold Hot Air Generator HAP series is required. The model depends on the airflow and temperature inside the tent, please consult us for model selection.
- Please note that Hot Air Generators are not for outdoor use.
- Due to the specifications (max. operating temperature) of the tent material, please set the temperature of the Hot Air Generator to be below 150 $^{\circ}$ C and the temperature inside the oven should be below 50 $^{\circ}$ C.
- Please note that due to the nature of the tent, a sealed structure is not possible.

Dimension example W \times L \times H (mm)	Weight (approximately)	Recommended Hot Air Generator
900 \times 1800 \times 2000	30 kg	HAP2052
1800 \times 3600 \times 2000	50 kg	HAP2082
2700 \times 4500 \times 2000	90 kg	HAP2152H

HOT AIR BOX

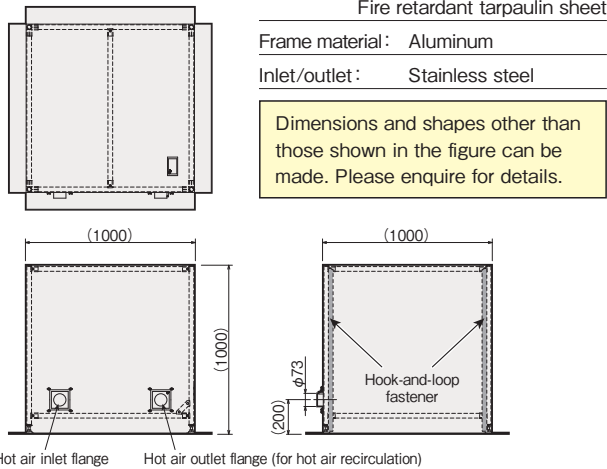
Simple small drying box ideal for drying and curing small items



Applications

- Preheat or drying of small items
- Preheat or drying of food products
- Moisture removal of small parts

Dimensions & specifications



In stock	Model No.	Product code	Dimensions (mm)	Weight
	PSJ1110	00884500	1000 × 1000 × 1000	approx.11 kg

○ Recommended model for use

Product name	Model No.	Product code	Heater rated power	Common parts	Required parts			
					For setting Hot Air Generator air outlet temperature		For setting ambient temperature inside box	
					When used for hot air recirculation	When used for single pass (no recirculation)	When used for hot air recirculation	When used for single pass (no recirculation)
100V Hot Air Generator	HAP1113	00070005	1.2 kW	• Flexible duct • Tightening band	• Flange duct connector or flange damper • Gasket	• Aluminum tape	• Flange duct connector or flange damper • Gasket • Thermocouple*2	• Aluminum tape
Hot Air Generator 2000 series	HAP2032	00013241	3 kW					
	HAP2052	00013242	5 kW		• Thermocouple*2			
Hot Air Generator 4000 series	HAP2032F	00013250	3 kW			—	• Thermocouple*2	
	HAP2052F	00013251	5 kW	—				
Hot Air Generator 4000 series	HAP4530	00700530	3 kW		—	—		
	HAP4550	00700540	5 kW	—				

* 2 : 4000 series does not have external thermocouple input terminal, please use a separate controller.

Features

•Drying oven for low temperatures

Ideal for heating or drying applications with relatively low temperature of 80°C and below.

• Simple assembly and setup

Can be assembled in about 10mins (per 2 person). It is also easy to disassemble, therefore it can be compactly stored when not in use.

• Easy operation

Easy operation by just connecting it to the Hot Air Generator HAP series. (Optional parts are required.)

Precautions for use

- Separately sold Hot Air Generator HAP series is required.
- Please note that Hot Air Generators are not for outdoor use.
- Due to the specifications (max. operating temperature) of the fabric material, please set the temperature of the Hot Air Generator to be below 120°C and the temperature inside the oven should be below 80°C.
- Please note that a sealed structure is not possible.
- Please use on floors or surface that is fire retardant.

Hot air box usage example



Guideline for operating temperature

Air outlet temperature settings : ~120°C

Ambient temperature inside hot air box : ~80°C

(For external thermocouple input *1)

* 1 : External thermocouple input terminal is not attached for HAP4530 and HAP4550.

ROOM DRYER

30-70°C Low temperature warm air generator

■ HAD2040 (3P 200V 4kW)



■ HAD1012 (100V 1.2kW)



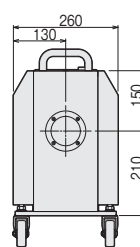
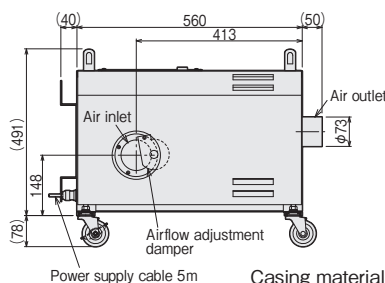
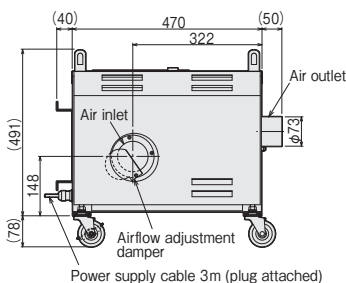
Features

- A device to generator warm air with relatively low temperatures of 30-70°C. Ideal for wallpaper drying, concrete curing and other applications that does not require hot air but warm air for warming.
- Compact and easy to carry. Can be moved freely when using since it is attached with flexible casters with brakes.

Dimensions and specifications

HAD1012 For 100V

HAD2040 For 3P 200V



Power supply cable 3m (plug attached)

Power supply cable 5m

Casing material : Steel plate (coated)

Applications

- Drying after wallpapering
- Curing after concrete works
- Moisture removal or drying after wash.

Precautions for use

- For indoor use only. Do not use it outdoors where it is expose to wind and rain, or at locations which are exposed to water or condensation.
- Please keep the suction air temperature below 40°C. Can not be used for recirculation heating.
- The device is for heating of air only, do not use it to heat explosive, flammable or combustible gases.
- Please use the switch at the top of the unit to stop the operation. After stopping the operation, the blower will run for 2mins for cooling down. During this time, never stop the operation with the circuit breaker or by removing the power supply cable.
- Do not insert your finger or other objects into the air inlet and air outlet.

	In stock	◎	◎
Model No.		HAD1012	HAD2040
Product code		00701010	00701020
Power supply		100V 50/60Hz	3P 200V 50/60Hz
Heater power rating		1.2 kW	4 kW
Supply air temperature (when ambient temp. is 20°C)		30~40°C (damper fully opened) 60~80°C (damper fully closed)	70~80°C (damper fully opened) 100~110°C (damper fully closed)
Temperature control		2-point ON/OFF control with liquid expansion thermostat	
Thermostat temperature setting range		30 ~ 80°C	30 ~ 110°C
Airflow (50/60Hz) reference value		3.9/4.6 m³/min (Airflow adjustment damper fully opened) 1.2/1.5 m³/min (Airflow adjustment damper fully closed)	
Airflow adjustment method		Suction airflow adjustment with airflow adjustment damper	
Air inlet diameter		φ 76 (SPCC pipe)	
Air outlet diameter		φ 73 (Stainless steel pipe)	
Suction air temperature		-10 ~ 40 °C	
Blower specifications	Max. airflow (50/60Hz)	5.4 / 6.2 m³/min	
	Max. static pressure (50/60Hz)	0.63 / 0.91 kPa	
	Blower power rating	100V 0.15kW	3P 200V 0.15kW
	Noise at max. airflow(50/60Hz)	70 / 74 dB	
Weight		24 kg	28.5 kg
Power supply cable		Cabtyre cord (VCTF) 3m with plug attached	Cabtyre cord (VCTF) 5m

COMMUNICATOIN SHEET HOT AIR GENERATOR

◆ Sender

Company			
Address	-		
Department		Title	
Name			
TEL		FAX	
E-mail			

Hakko Electric Co., LTD.

Please contact the nearest branch or sales office. Please see the back cover for telephone and fax numbers.

Request for quotation / Technical support

Day / Month / Year

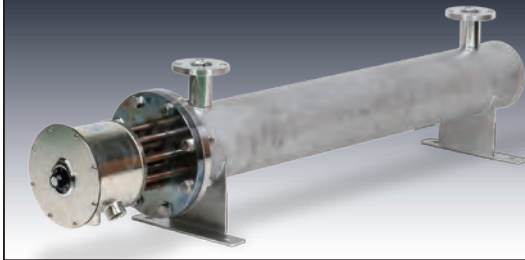
check the applicable items, and fill in specific information inside the bracket ().

1	Operating power	<input type="checkbox"/> 3P 200V <input type="checkbox"/> 1P 200V <input type="checkbox"/> Others(V)	<input type="checkbox"/> Frequency (Hz)
2	Purpose of use	<input type="checkbox"/> Drying (what and how:) <input type="checkbox"/> Others (what and how:)	
3	Required temperature	<input type="checkbox"/> Hot air temperature (°C)	<input type="checkbox"/> Temperature inside oven [for internal oven heating] (°C) Oven external dimensions (W × D × H) Thermal insulation layer thickness of wall for oven (mm)
4	Required airflow	<input type="checkbox"/> Airflow (m ³ /min, at °C) <input type="checkbox"/> Unknown	
5	Required static pressure or ducting pressure drop	<input type="checkbox"/> Static pressure (kPa) <input type="checkbox"/> Pressure drop (kPa) <input type="checkbox"/> Unknown	
6	Hot air recirculation / non recirculation	<input type="checkbox"/> Single pass <input type="checkbox"/> Hot air recirculation (100%) <input type="checkbox"/> Partial recirculation (%)	
7	Operating condition	<input type="checkbox"/> Hot Air Generator only [HAP type] <input type="checkbox"/> To be integrated into other equipment or machinery [Hot Air Generator with control feature: HAP type] <input type="checkbox"/> To be integrated into other equipment or machinery [Hot Air Generator without control feature: HAS type]	
8	Presence of gas generated from heating	<input type="checkbox"/> No <input type="checkbox"/> Yes (what and how much:)	
9	Remarks and others	Please fill in as much details as possible if you have any request about specific usage (illustration), installation at special environments, control of the Hot Air Generator etc. If the provided space is not enough, please attach another sheet and fill in to it.	

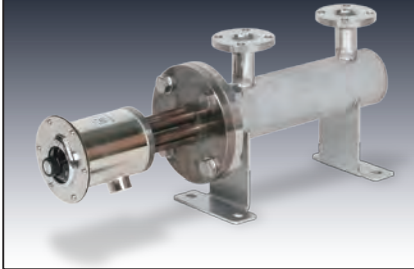
HOT AIR GENERATOR RELATED PRODUCTS

"Hakko Electric General Catalog" for details on each product

● Air heating unit
Heater flange nominal diameter 150 (150A) type



● Air heating unit
Heater flange nominal diameter 80 (80A) type



● Fan attached duct heater
Cold region type



● Warm air device



● Heater unit for drying



● Fan attached duct heater



● Hot air beam Type S
Dry fired detection, intermittent operation type



CAUTION

Depending on your country's law and regulation and the capacity of the heater used for your equipment, you may need approval from local authorities, appoint a qualified person to be in charge of the equipment, perform and record routine inspection etc. Please consult your local government office for details before use.

HOT AIR GENERATOR TELEPHONE CONSULTATION DESK

You can contact us using the phone number listed below for any technical support regarding the Hot Air Generator. If you have any questions, concerns or inquiries regarding model selection, please feel free to contact us.

East Japan : Tokyo branch,
Hakko Electric Co.,LTD.

TEL. 03-3464-8764

Operating hours:
Monday to Friday 9:00 - 7:30 (JST)

HOT AIR GENERATOR MAINTENANCE SERVICE

We accept request for maintenance of Hot Air Generator. If you have any request about maintaining, inspecting, repairing etc, please contact our hot air generator telephone consultation desk, or the nearest branch or sales office of Hakko Electric Co., LTD. You can also request on our homepage. www.hakko.co.jp

DEMO UNIT LENDING SERVICE

We accept request for demo unit lending service. Please contact our hot air generator telephone consultation desk, or the nearest branch or sales office of Hakko Electric Co., LTD. You can also request on our

The contents published is as of October 2020. For improvements, specifications are subject to change without notice. Updates are also posted on our homepage. www.hakko.co.jp

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OOMIYA BRANCH TEL.048-667-8500 FAX.048-667-0008
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