HI·HEATER

Hi-Heater heating instantaneously

MIYAKAWA CORPORATION

Miyakawa is a proposal-oriented business organization where "light and heat" are handled from engineering point of view.

Miyakawa provides not only manufacture and sale of Heaters but also make proposals on development of facility relevant to "light and heat" that will fulfill customers' satisfaction.

USA SAMPLE OF EACH FIELD

Resin
Film drying　Blow molding
Laminating　Vacuum metalizing
Resin hardening (short time)
Stretching　Resin adhesion

Metal
Aluminum foil
Annealing steel sheet
Heat source of hot-pressing
Simulation equipment

Electronic components
Soldering device
Screening
Resin hardening
Local reflowing device

Fabric
Stretching textile thread
Adhesion of fabric

Semi-conductor
Hardening conductive adhesive
Development of heat source for annealing Heating equipment inside vacuum furnace

Glass・lens
Drying coated film
Heat source for molding die
Heating equipment of intermediate film

Miyakawa's technology used in various industries

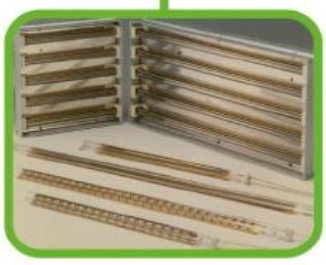
Facility design technology




Applied technologies for "light and heat"


Applied technologies for hot air


Applied technology for Near-infrared ray


Applied technologies for medium wavelength infrared ray

Heating from room temperature to high Temperature range (up to 800℃)

*Maximum temperature depends on Various conditions

With the combination of compact body and a variety of blowing nozzle configuration, the heater meets customer's various needs such as local heating and wide area heating.

Technical strength that Miyakawa is proud of【3 points】

1. Long life thanks to improvement of durability performances

Coil-stopper mechanism is our own technology that improves durability performances. The technology can suppress change of coil shape that causes open heater.

2. Sensor to prevent extreme temperature rise is fixed to heater body

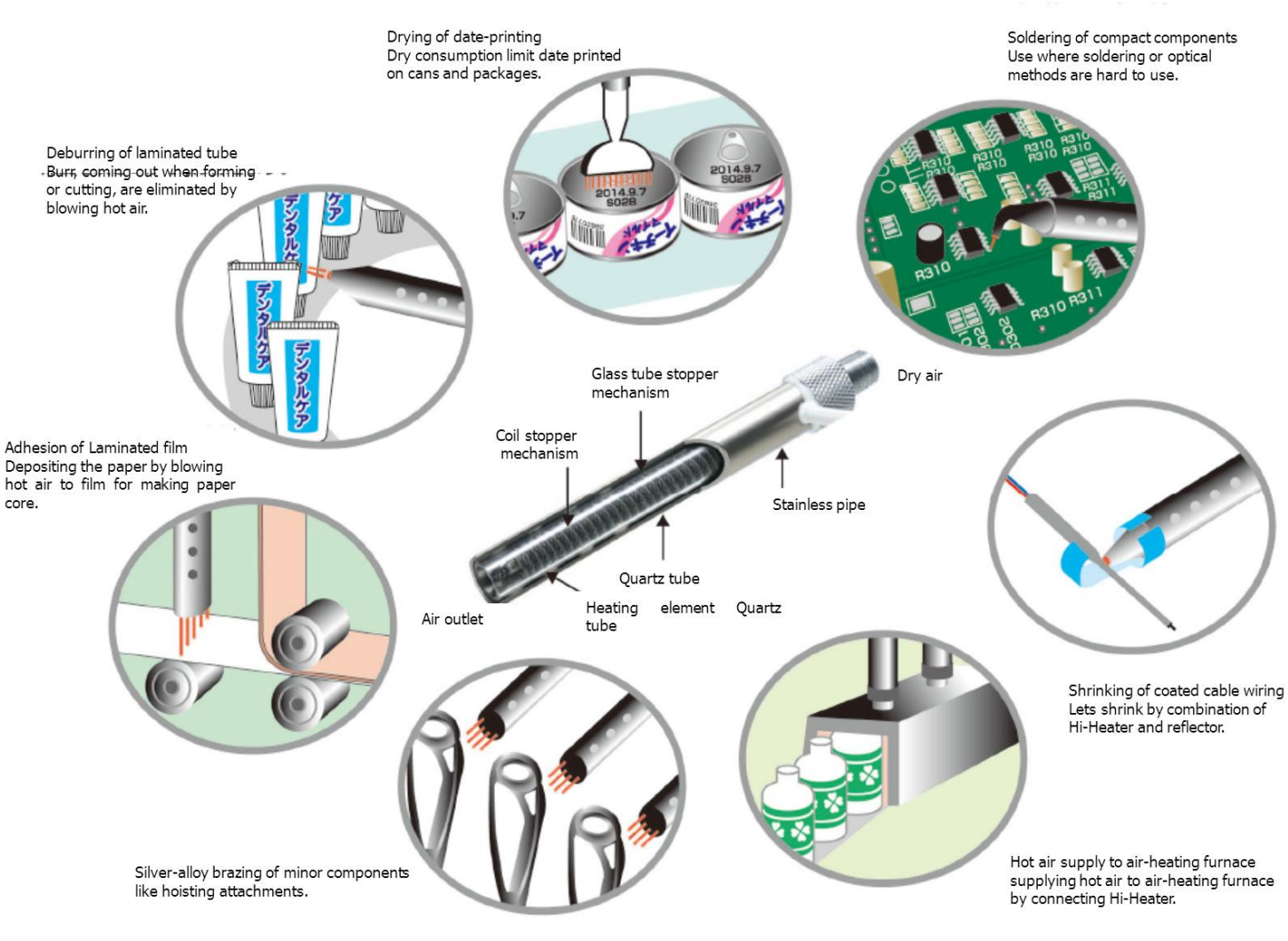
It prevents from overdriving of heater, when temperature-controlling thermocouple fails, heater opens or temperature regulator is out of order.

3. Wide variety of hot air blowing nozzle can be designed and manufactured

There are 2 kinds of nozzles to manipulate hot air, that is metal processing and glass processing. If a desired nozzle configuration is designated, the manufacturer will design and manufacture it.

Various kinds of the heaters

Other than the standard Hi-Heater, we have ①Micro Hi-Heater, ②N2 Hi-Heater (exclusive use for nitrogen), ③Burring Hi-Heater (exclusive for burring) and ④Slit nozzle.

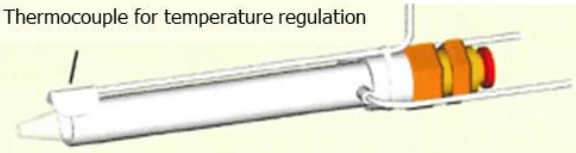


SAH series Standard Output Type (100W～550W)

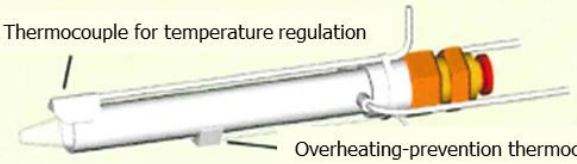
Diameter of stainless steel protection tube (φ13mm)

SAH

T Thermocouple for temperature regulation



T2 Thermocouple for temperature regulation



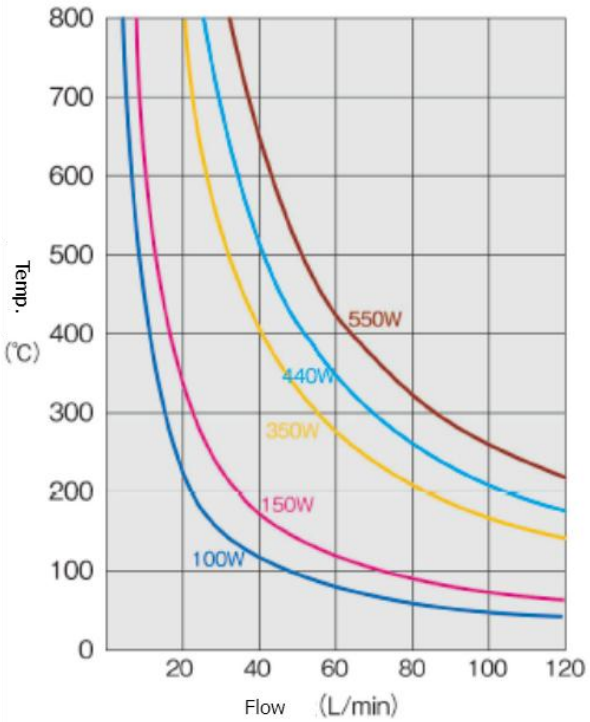
Overheating-prevention thermocouples

Oder form → SAH | 1 (1:AC100V 2:AC200V) | A | H | T | 350 W

Lead wire 150mm
Thermocouple 1000mm
(Length can be changed)

Series name	Nozzle shapes	Base shapes	Temp. sensor	Voltage	Output (W)
SAH series 	A  B  C  D  P 	H  R 1/8 F  φ6 one touch	T T2	AC100V	100 150 350 440 550
				AC200V	— 200 350 440 —

Relation between hot air discharge rate and temperature



Calculating formula of approximate output

*Use it only as a guide for selection of heater output.

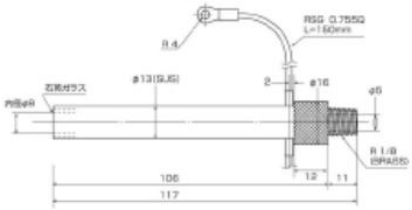
$$\text{Output (W)} = \frac{\text{Flow(L/min)} \times [\text{hot air temperature} - \text{Supply air temperature}]}{\text{Coefficient}}$$

Flow Temp	Number
～200	45.8
200～300	45.6
300～500	44.7
500～700	43.9
700～	42.6

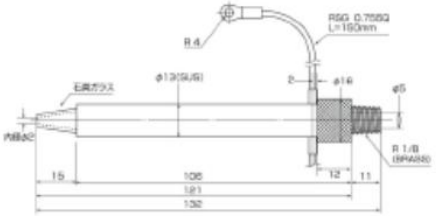
Dimensional drawing

*Common dimensions for 100W～500W

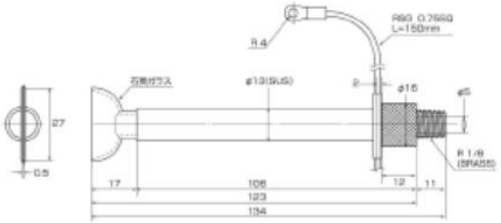
A type
Blowing diameter φ8



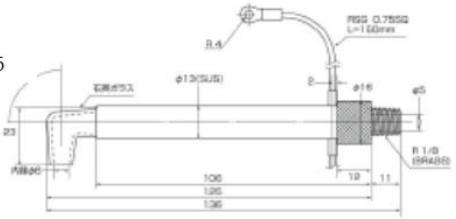
B type
Blowing diameter φ2



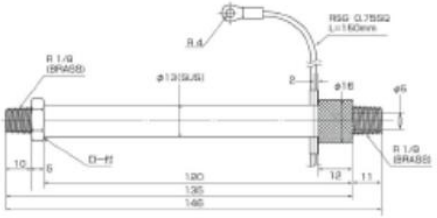
C type
Blowing size
27mm × 0.5mm



D type
Blowing diameter φ6



P type
Nipple tip 1/8PT



*The manufacturer accepts manufacture of specially ordered diameter and size for B type and C type.

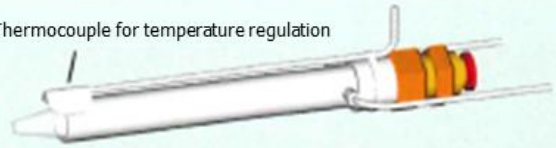
Refer to the lower parts of 5 and 6 pages with regard to process of heater selection.

SAH series High Power Output Type (650W～3000W)

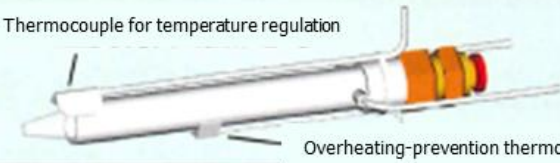
Diameter of stainless steel protection tube
(ϕ13, ϕ22, ϕ30mm)

SAH

T Thermocouple for temperature regulation



T2 Thermocouple for temperature regulation



Overheating-prevention thermocouples

Oder form → SAH 1 A H T 350 W

1:AC100V
2:AC200V

Lead wire 300mm
Thermocuple 1000mm
(Length can be changed)

Series name	Nozzle shapes	Base shapes	Temp. sensor	Voltage	Output (W)
SAH series 	A  B  C D P 	H  R 1/8 F  to 1KW φ6 upto 2KW φ10	T T2	AC100V	650 800 1000 — —
				AC200V	650 800 1000 2000 3000

*Base configuration R 1/4in case of 2KW and 3KW of H specification

Relation between hot air discharge rate and temperature

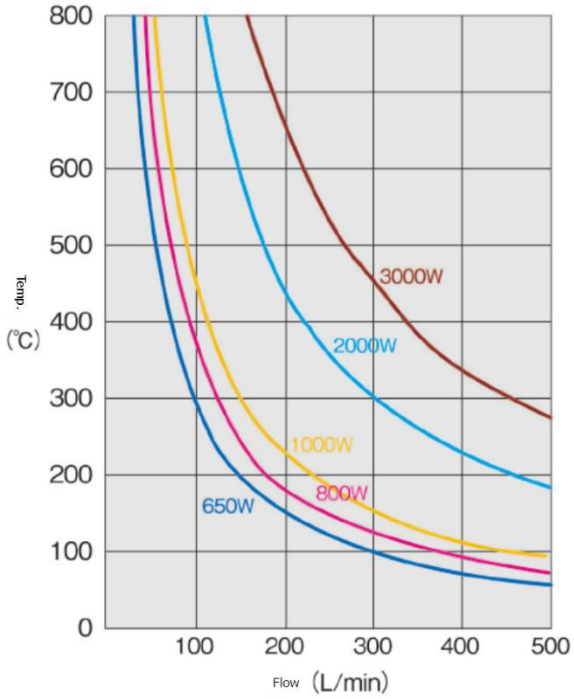
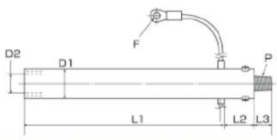


Chart for dimension of the Heaters of 650W～3000W



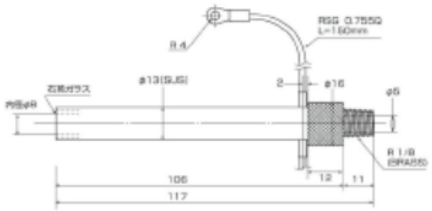
	P	L1	L2	L3	D1	D2	GS WIRE		
	R(PT)	mm	mm	mm	φ	φ	Lmm	sq	R
100V-650W	1/8	147	18	11	19	12.5	300	1.25	R4
100V-800W	1/8	167	18	11	19	12.5	300	1.25	R4
100V-1KW	1/8	167	18	11	19	12.5	300	1.25	R4
200V-650W	1/8	147	18	11	19	12.5	300	1.25	R4
200V-800W	1/8	147	18	11	19	12.5	300	1.25	R4
200V-1KW	1/8	167	18	11	19	12.5	300	1.25	R4
200V-2KW	1/4	277	23	11	22	16	300	1.25	R4
200V-3KW	1/4	319	16	15	30	23	300	2.00	R5

Dimensional drawing

*650W
(Refer to the chart below left for >800W)

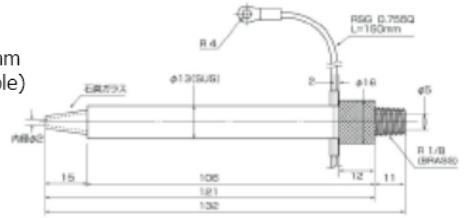
A type

Blowing diameter φ12.5



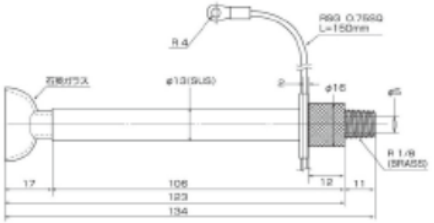
B type

Blowing diameter φ4mm
(over φ4mm is available)



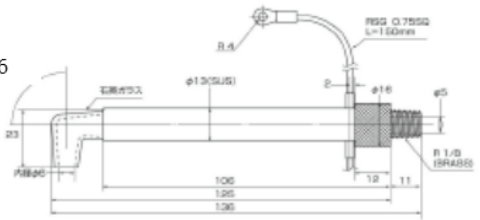
C type

Blowing size
48mm × 1.5mm



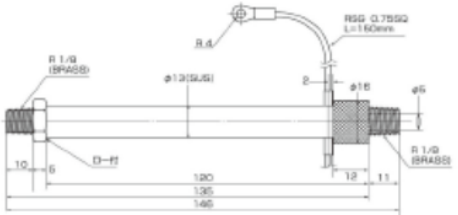
D type

Blowing diameter φ6



P type

Nipple tip 1/8PT



*The manufacturer accepts manufacture of specially ordered diameter and size for B type and C type.

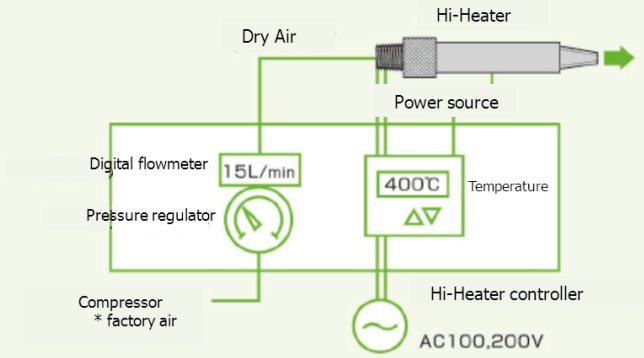
Refer to the lower parts of 5 and 6 pages with regard to process of heater selection.

Before use

How to set the Hi-Heater and peripheral equipment

2 examples are shown here -"Recommended case" and "Simplified case.

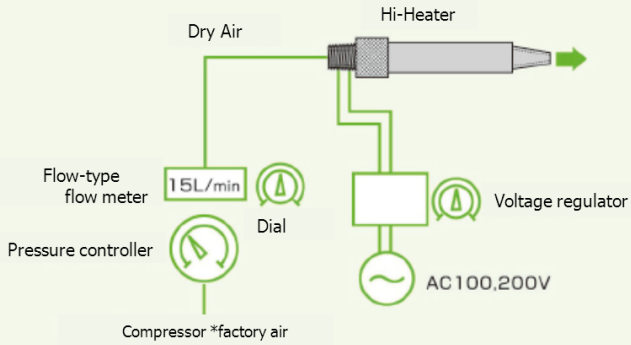
Recommended case by Miyakawa (automatically controlled by an exclusive controller)



3 elements of control
1. Tmperature setting by temperature Controller (PID control)
2. Flow (Digital flow meter)
3. Distance (between workpiece and blow opening)

* Use at designated pressure of flow meter in use.

Simplified case



3 elements of control
1. Voltage
2. Flow (Flow meter)
3. Distance (between workpiece and blow opening)

*Use at designated pressure of flow meter in use.

Controller for exclusive use

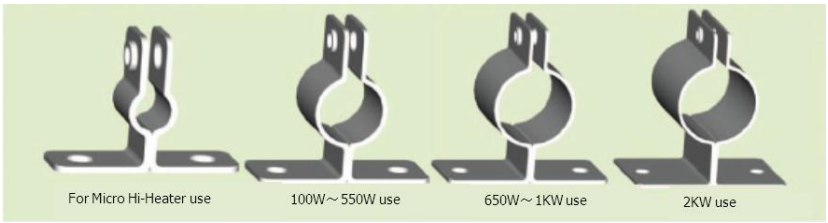
There are various types of controller from cheap edition to the all-in-one-type in which temperature, air pressure and air flow can be controlled. The manufacturer designs and manufactures controllers that meet the customers' needs. The details can be downloaded from the manufacturer's home page. Information materials from ① to ③ below are available for the customers' review.

1) Temperature controller
<HYK-15L>

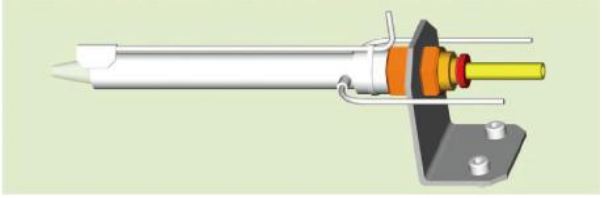
2) Temperature, air pressure and flow rate controller
<HYK-20AF-D>

3) Temperature, air pressure, flow rate controller with over-temperature monitoring
<HYK-20AF-DK>

Heater-fixing bracket



Special holders



One-touch joint

Precautions for use

- Observe such work sequence strictly, that is, flowing air prior to putting electrical source and shutting it about 60 seconds after turning off the electric source.
- In case of using commercially available temperature controller, actual temperature may not be stable. It is recommended Miyakawa's exclusive controller to be used.
- Heater life could be extremely short if it is fixed to movable part such air-cylinder. Check once with the manufacturer.
- If calm condition (no wind) continues for long period or high loading voltage is applied to the heater at low flow (0～10L/min) atmosphere, blow opening of stainless tube begins to become red. If this state continues for 1～2minutes, the heater breaks (opens). Be careful about the stainless tube not to become red heat.

Advance Knowledge when using Hi-Heater

- Kind of gas
  The gas which can be use for this basically "air". Use gas which does not contain oil-mist moisture. When using nitrogen, consult with the manufacture.
- Pressure and flow
  Air pressure that suits Miyakawa's Hi-Heater is the range of 0.1Mpa to 0.3Mpa. With regard to flow, please refer to "Relation between hot air discharge rate and temperature" graph.
- Rise time of Hi-Heater
  It reaches to preset temperature in 30～60secs.

Goal of the heater temperature

Consult with the following 3 patterns with regard to the criterion whether the heater is used in good condition.
In case of the standard output type, there are 4 openings on the stainless tube.
Color shade seen through these holes are the criterion.

● Good use situation

Hot air of 600～700℃ is flowing.
(goes red to the 3hd hole from right side)
Color of stainless tube is normal.
*As hot air temperature becomes high, tube turns red from the right side of far

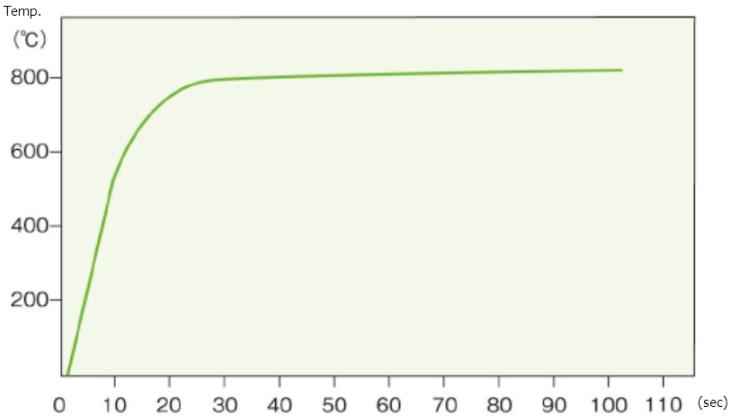
● Too little air flow

Hot air at hotter than 900℃ is flowing.
Head of stainless tube begins to glow.

● No air flow

Central part of stainless tube glows.

Profile of temperature rise



●Measurement condition

Voltage:100V Type name of the measured unit: ASH-1AH(100V 350W)
Flow: 15L/min Measuring position: At 2mm for tip of blow opening.

Background information for selection of Hi-Heaters (Refer to 3 and 4 pages)

Before use of the Hi-Heaters, please select 5 items on the right.
If you have any questions.
Please contact with the manufacturer.

1) Voltage

Select either One of 100V or 200V

2) Output

Select between

100W～3KW

3) Nozzle configuration
Select from basic configurations-A, B, C, D, P.
Dimensions are modifiable in case of B, C and D.
In case of standard output type-B: 2mm diameter can be modified to 3mm and 4mm.
In case of standard output type-C:27mm×0.5mm can be modified freely.

4) Base configuration

Two type of basic

H and F

5) Temperature sensor
Select from T, T2 and T3 type
T type "Temperature-regulating thermocouple" which is built in nozzle tip
T2 type "T Temperature-regulating thermocouple" and "Overheating-prevention thermocouple" (This is fixed to heater body and it prevents from over-driving of heater, when T fails, heater opens or temperature regulator is out of order.
T3 type Body temperature of heater is monitored by thermostat and overheating of the body prevented.

The manufacture provides with special order items. Please indicate desired nozzle configuration

① Quartz nozzle 90°bent
② Quartz nozzle 45°bent (slit width:10mm×2mm)
③ Quartz nozzle Circle type facing blow
④ Metal nozzle 30°bent (φ2mm)
⑤ Metal nozzle 45°bent (φ2mm)
⑥ Metal long nozzle
⑦ Metal flat nozzle porous hole type
⑧ Metal slit nozzle (0.15mm×100mm) * blows hot air like air curtain.

*Details about metal slit nozzle can be downloaded from the home page.

MIYAKAWA CORPORATION

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