Radiant tube burner

RTR burner

RTR-100A,125A

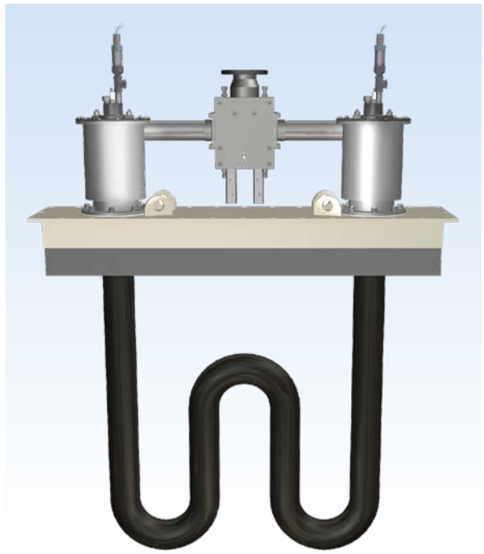
Burner for ultra-high efficiency regenerative radiant tube capable of compact and high load combustion.

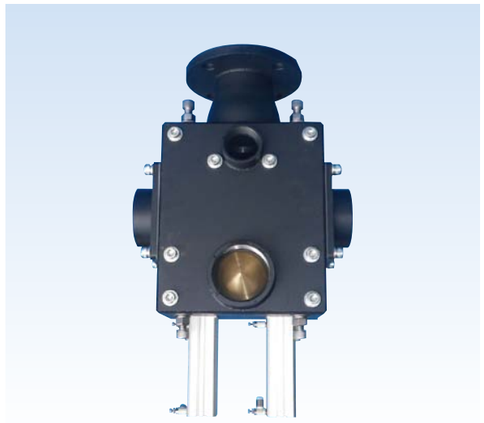
Feature

An indirect heating type burner which enabled tube efficiency of 80% or more.

A low pressure loss ceramic porous body is used as a heat reservoir, and it is compact but high load combustion is possible. There are 2 models of 100A, 125A.

1. High efficiency (tube efficiency is 80% or more.
2. A heat reservoir is built in the burner and it is compact.
3. Because the pressure loss of the heat reservoir is small (<0.3 kPa), high load combustion becomes possible.
4. It can time proportional ON / OFF control in the direct ignition.
5. Because switching combustion, the tube surface temperature is uniform.
6. The combustion noise hardly occurs.





selector valve (option)

Main Usage

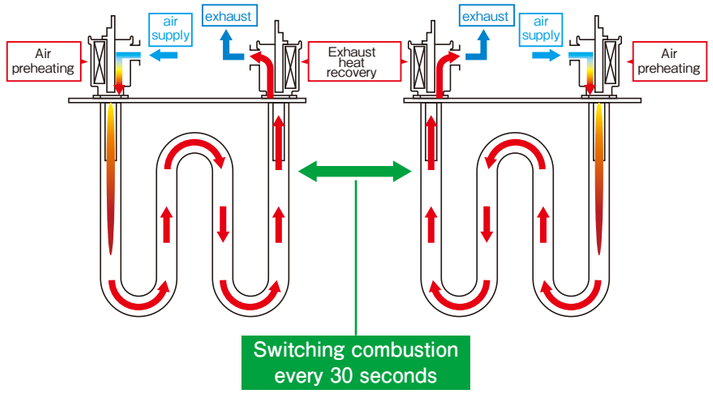
- Atmosphere heat treatment furnace
- Immersion type melting furnace

In addition, it is suitable for indirect heating furnace.

Principle and structure

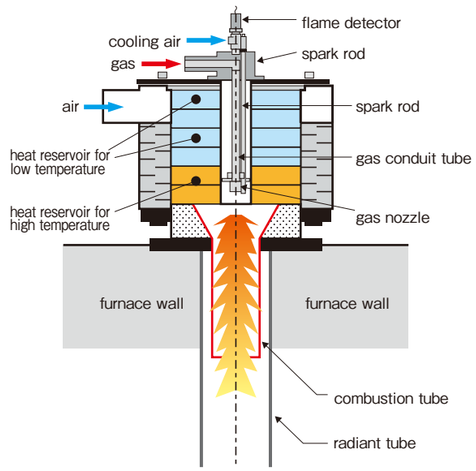
Regeneration system

The regeneration system normally burns 2pcs/set of burners (regenerative burners) integrated with heat reservoir alternately at intervals of several 10 of seconds.And when one burner is burning, its exhaust is discharged through the heat reservoir of the other burner, then when the burner burns it is preheated with heat reservoir to recover waste heat.
For radiant tubes, tube efficiency of more than 80% can be achieved by alternately burning regenerative burners on both ends of U / W type tubes.



RTR burner

The RTR burner contains several donut-like heat reservoir (ceramic porous bodies) in the burner body. The exhaust heat is stored in heat reservoir and recovered by preheating the combustion air after the combustion switching. Preheated air mixes with gas in the combustion tube to form a flame. Cooling air cools the flame detector, flows through the guide pipe, and also cools the gas nozzle.

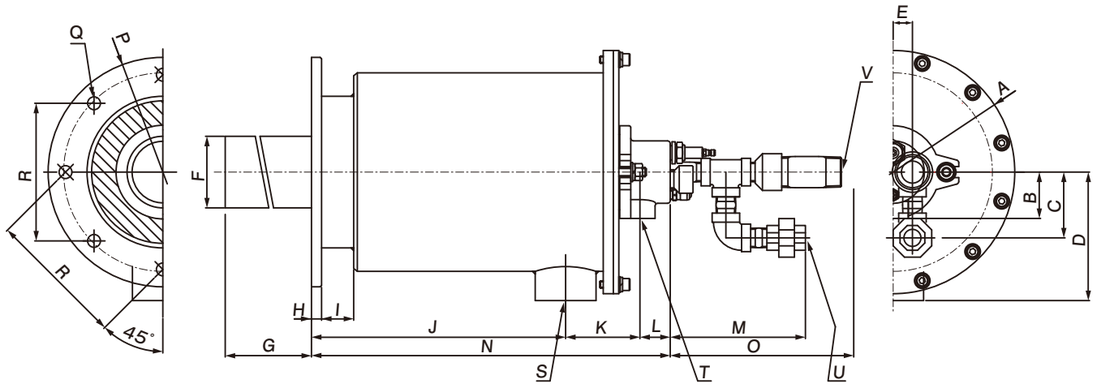


Specifications

Model	RTR-100A	RTR-125A
Combustion capacity	52kW	75kW
Maximum use temperature	950℃	950℃
Standard gas inlet pressure	2.5kPa	2.5kPa
Standard air inlet pressure	2.5kPa	2.5kPa
Standard air pressure	72m³N/h	104m³N/h
Primary (cooling) air flow rate	2.0m³N/h	3.0m³N/h
Control	On-Off	
Ignition	direct ignition	
Flame supervising method	ultraviolet phototube	
Turn-down ratio	2:1	
Gas type	LPG・LNG	
Exhaust recirculation start temperature	500℃	
Minimum tube inner size※	ϕ103mm	ϕ110mm

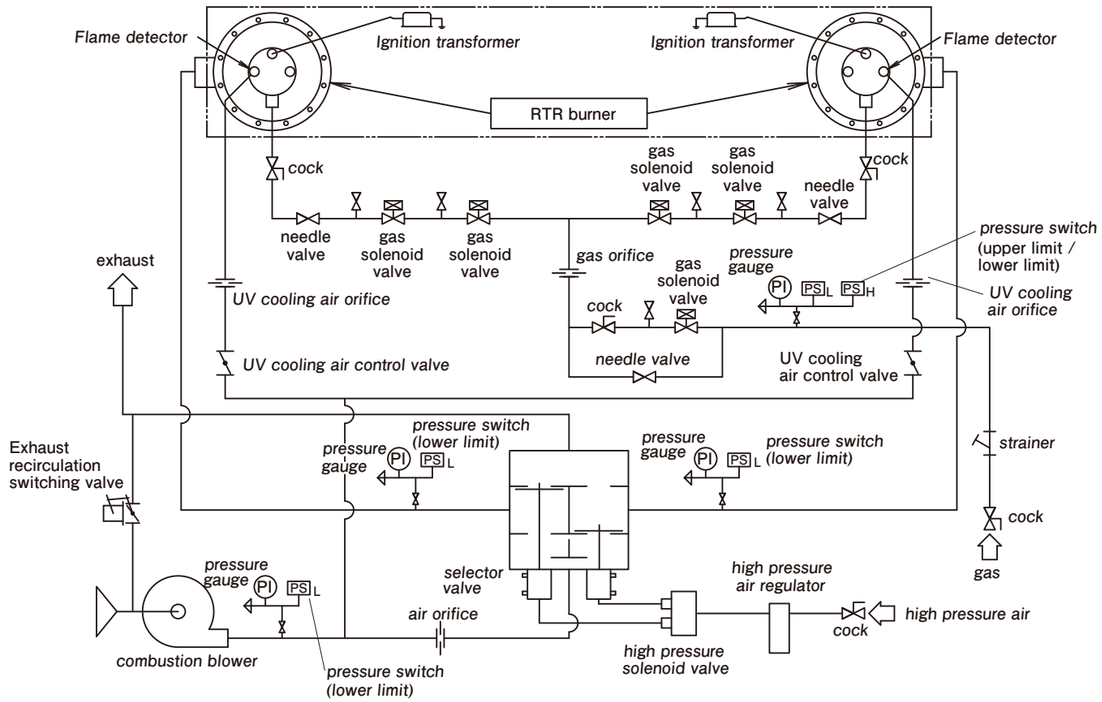
※ Inner size of the tube exceeding the above size is required.

Overall size

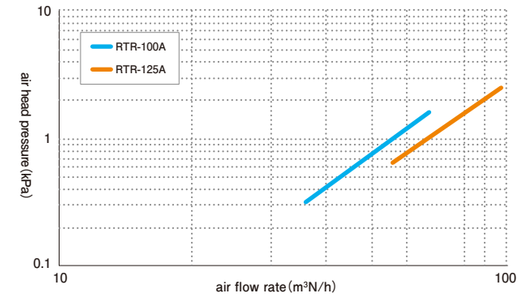


Model		RTR-100A	RTR-125A	Remarks
Overall size	A(mm)	ϕ265	ϕ330	
	B(mm)	50.5	50.5	
	C(mm)	(72)	(72)	
	D(mm)	140	175	
	E(mm)	21	21	
	F(mm)	ϕ89.1	ϕ101.6	combustion tube
	G(mm)	390	390	
	H(mm)	11	11	
	I(mm)	35	35	
	J(mm)	277	217	
	K(mm)	81	81	
	L(mm)	33	33	
	M(mm)	(150)	(150)	
	N(mm)	391	331	
	O(mm)	(200)	(200)	
mounting size	P(mm)	ϕ250	ϕ320	
	Q(mm)	4-ϕ14	4-ϕ17	
	R(mm)	□150	□200	
connecting size	S(Rp)	2	2	suction and exhaust connection
	T(Rp)	1/2	1/2	gas connection
	U(Rc)	1/2	1/2	Primary (cooling) air connection
	V(R)	1	1	Flame detector connection

Example of flow sheet

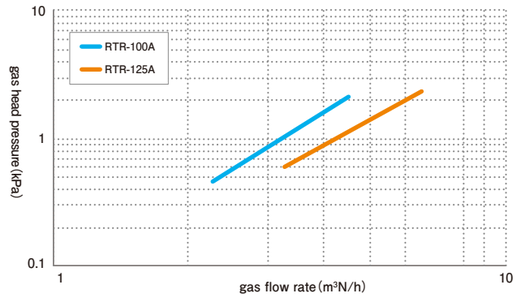


Relationship between air flow rate and air head pressure



【Measured value】 ●Furnace temperature: 950 ℃ ●Air ratio: 1.2

Relationship between gas flow rate and gas head pressure

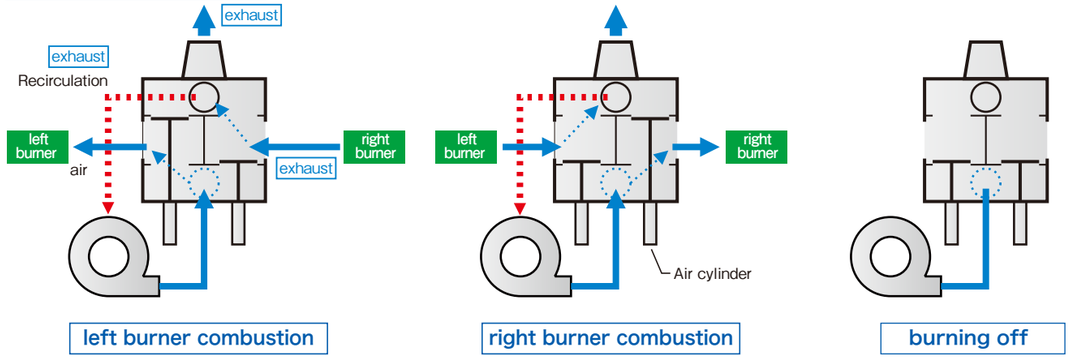


【Measured value】
●Furnace temperature: 950 ℃ ●Air ratio: 1.2 ●13 A gas

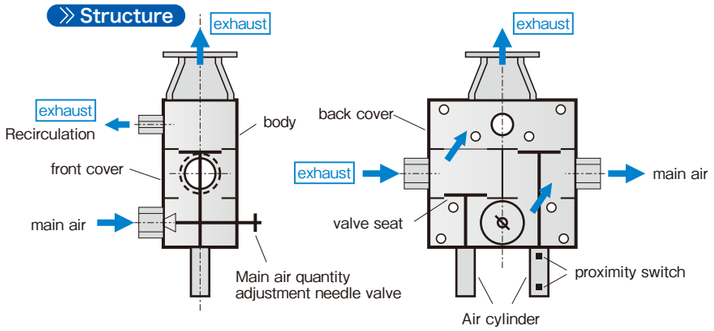
Box type selector valve (option)

It is air and exhaust selector valve dedicated to RTR burner. Piping can be greatly simplified, making it possible to reduce the size and cost of the system The amount of leakage of air is small, it has a simple structure and is excellent also in durability and heat resistance. Also, at the time of combustion OFF, supply of air into the tube can be stopped, reducing heat loss.

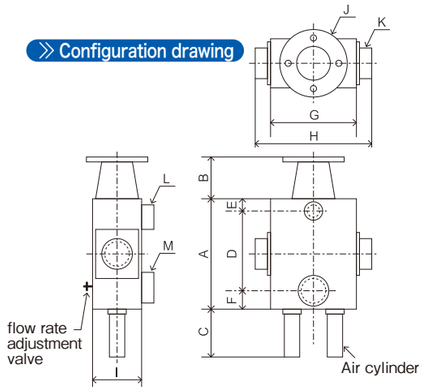
Action of selector valve



Structure



Configuration drawing



Model		FWV-65-2	FWV-80-2	Remarks
Standard air volume(m³N/h)		150	250	
Standard exhaust flow rate(m³N/h)		165	275	
Pressure loss(kPa)		0.3	0.35	Value at standard air flow rate (normal temperature)
Heat resistant temperature(°C)		450		
weight(kg)		10	14	
overall size (mm)	A	272	324	
	B	105	116	
	C	139.5	157.5	
	D	180	218	
	E	42	48	
	F	50	58	
	G	230	258	
	H	310	346	
	I	135	148	
connecting size	J	JIS5K flange 80A	JIS5K flange 100A	exhaust
	K(Rc)	2 1/2	3	burner
	L(Rc)	1 1/2	2	exhaust recirculation
	M(Rc)	2 1/2	3	air

Handling Precautions

1. For the RTR burner, it is necessary to recirculate the exhaust gas to outside at a furnace temperature of 500 ° C or higher in order to reduce NOx emissions. There is a method to let the blower suck the exhaust. The amount of exhaust gas recirculation is converted to the standard state and about 25% is required for combustion air.
2. Be sure to check the inner diameter of the radiant tube for each model.
   (φ 103 / φ 110 or more is required for RTR-100 A / 125 A respectively)
3. The time proportional ON / OFF method is recommended for temperature control In this case, please make sure that the air / gas supply to the burner is preceded by air for about 1 second.
4. Parts that may be damaged during transportation, such as ceramic burning cylinders and ceraforms, are separately delivered, so be sure to install them before use.
5. It is recommended to place a dedicated compressor in order to stably obtain high pressure air with the pressure required for selector valve action.