



Surface burner

# Surface combustion burners

BS-5~30

**BS burner is the large capacity premix type burner which realized large and strong heating by adopting blast combustion method.**

## Feature

BS burner can be larger and stronger heating than conventional burner type infrared ray burner (Schwank burner). The combustion capacity per unit area has also increased by about 40% because of adopting blast combustion method. The conventional burner has several defects. a) Gas quantity can not be squeezed b) Incomplete combustion is likely to occur due to exhaust shortage and dust clogging c) Less input per burner

For these reasons, for facilities requiring large energy such as industrial facilities, the number of burners will increase. A large capacity premix (blast) type Schwank burner BS burner was developed to solve problems such as the ignition device, combustion safety device, piping facility and piping facilities becoming expensive and becoming complicated.



### 1 Energy saving type with high radiation efficiency

Surface temperature of ceramic plate is 750~800 °C. radiation efficiency is 1.4 times higher than conventional burner, energy saving is achieved.

### 2 Easy to install because it is lightweight

It is easy to install because the burner unit is made of steel plate and lightweight.

### 3 The heating direction is flexible

Since heating directions can freely choose upward, downward and sideways, it is possible to mount suitable for the equipment.

### 4 Stable combustion

Because of blast (premix type) combustion, it can be burned in a relatively closed type furnace, and combustion failure owing to dust etc. is difficult to occur.

### 5 Automatic Ignition / Combustion Safety control device

Operability and safety will be further improved if automatic ignition / combustion safety control device is installed.

## Specifications

Model	BS-5	BS-6	BS-7	BS-8	BS-9	BS-10	BS-11	BS-12	BS-13	BS-14	BS-15	BS-16	BS-17
standard combustion capacity(kW)	5.8	7.0	8.2	9.3	10.5	11.6	12.8	14.0	15.2	16.3	17.4	18.6	19.8
standard air (m³/h)	for combustion	5.5	6.6	7.7	8.8	9.9	11.0	12.1	13.2	14.3	15.4	16.5	17.6
	for cooling	5.0	6.0	7.0	8.0	9.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
connection size (Rc)	mixed gas	1	1	1	1	1	1	1	1	1	1	1	1
	cooling air	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
weight(kg)	5	6	7	8	9	10	11	12	13	14	15	16	17

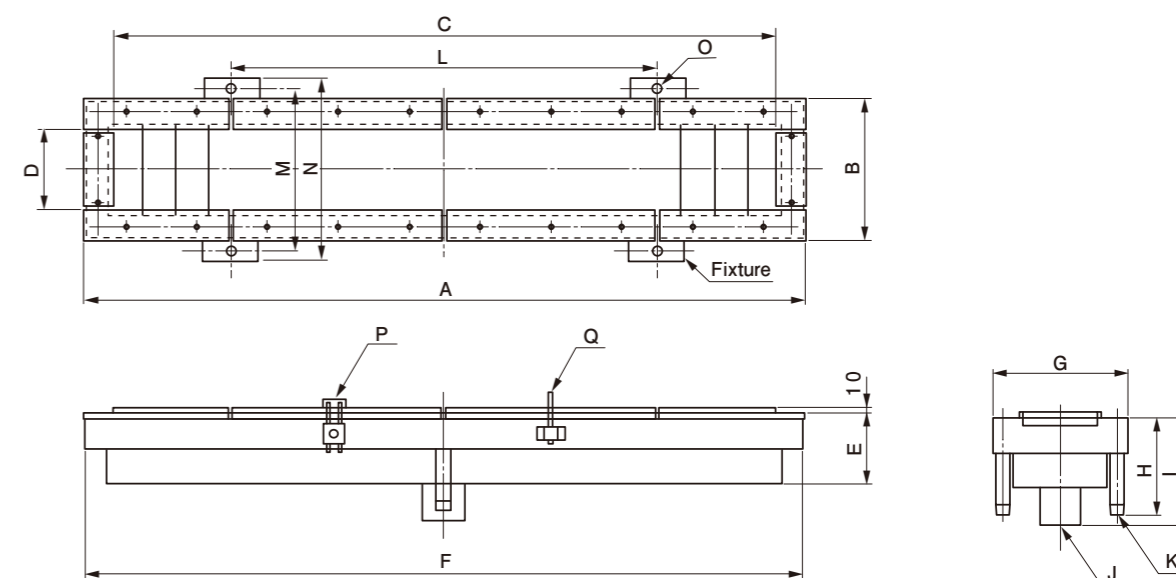
  

Model	BS-18	BS-19	BS-20	BS-21	BS-22	BS-23	BS-24	BS-25	BS-26	BS-27	BS-28	BS-29	BS-30
standard combustion capacity(kW)	20.9	22.1	23.3	24.4	25.6	26.7	27.9	29.1	30.2	31.4	32.6	33.7	34.9
standard air (m³/h)	for combustion	19.8	20.9	22.0	23.1	24.2	25.3	26.4	27.5	28.6	29.7	30.8	31.9
	for cooling	19.0	20.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0	31.0
connection size (Rc)	mixed gas	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	cooling air	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
weight(kg)	18	19	20	21	22	23	24	25	26	27	28	29	30

※Standard combustion capacity is the OPEN combustion and the surface temperature of the burner is 800°C as the standard.

※Supply gas pressure 2.8kPa(13A), 2.8kPa (LPG) ※Air pressure 6kPa(venturi mixer method), 3.4kPa(low pressure mixer method)

## Overall size



Model	BS-5	BS-6	BS-7	BS-8	BS-9	BS-10	BS-11	BS-12	BS-13	BS-14	BS-15	BS-16	BS-17	
standard adaptive mixer *1	VM-15				VM-20				VM-25					
overall size (mm)	A	304	355	399	447	494	542	589	637	684	732	778	827	
	B	202												
	C	217	265	312	360	407	455	502	550	597	645	693	740	827
	D	112												
	E	100												
	F	298	346	393	441	488	536	583	631	678	726	772	821	868
	G	196												
	H	150												
	I	146												
connection size(R)	J	1												
	K	1/2												
overall size (mm)	L *2	160	190	210	240	260	290	310	340	360	390	420	440	470
	M	250												
	N	296												
	furnaces mounting(mm)	O	4-φ14											
ignition, detector	P	Please contact us for mounting position of ignition rod and detection sensor(option).												
	Q													

Model	BS-18	BS-19	BS-20	BS-21	BS-22	BS-23	BS-24	BS-25	BS-26	BS-27	BS-28	BS-29	BS-30	
standard adaptive mixer *1	VM-25								VM-40					
overall size (mm)	A	922	969	1017	1064	1112	1159	1207	1254	1302	1349	1397	1444	1492
	B	202												
	C	835	882	930	977	1025	1072	1120	1167	1215	1262	1310	1357	1405
	D	112												
	E	100												
	F	916	963	1011	1058	1106	1153	1201	1248	1296	1343	1391	1438	1486
	G	196												
	H	150												
	I	152												
connection size(R)	J	1 1/2												
	K	1/2												
overall size (mm)	L *2	490	520	550	570	590	620	650	670	700	730	750	770	800
	M	250												
	N	296												
	furnaces mounting(mm)	O	4-φ14											
ignition, detector	P	Please contact us for mounting position of ignition rod and detection sensor(option).												
	Q													

※1 Please pay attention to piping pressure loss such as flexible to the burner

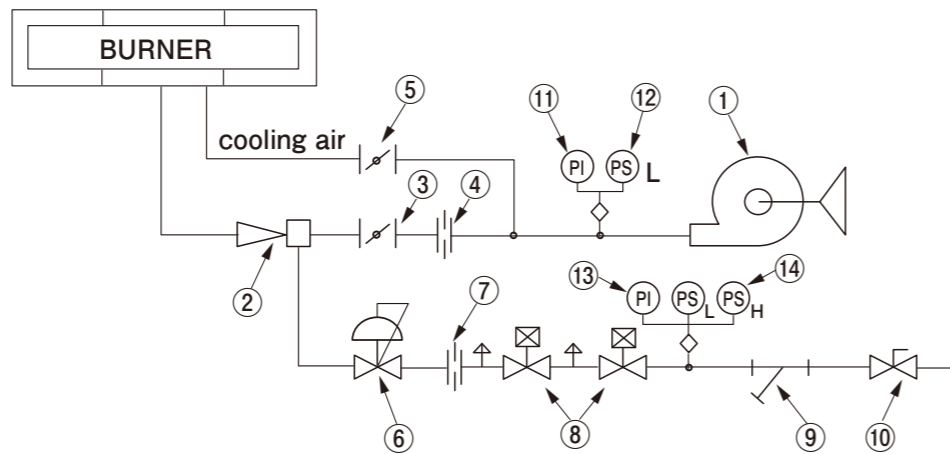
※2 Please contact us for mounting position of fixture. Depending on the mounting position of PQ, it may not be installed in the above position.

Example of flow sheet

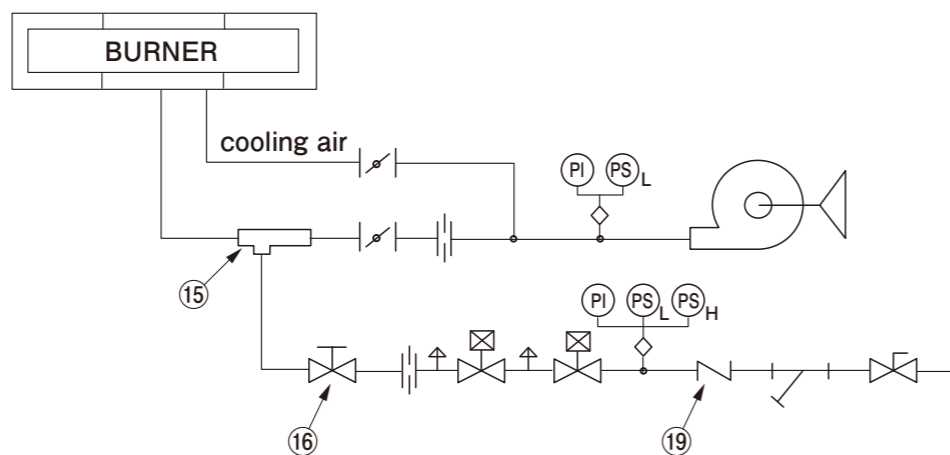
Standard flow sheet of the BS burner has a forced air cooling system that cools the ceramic plate in a short time in addition to the basic combustion system.

basic combustion system

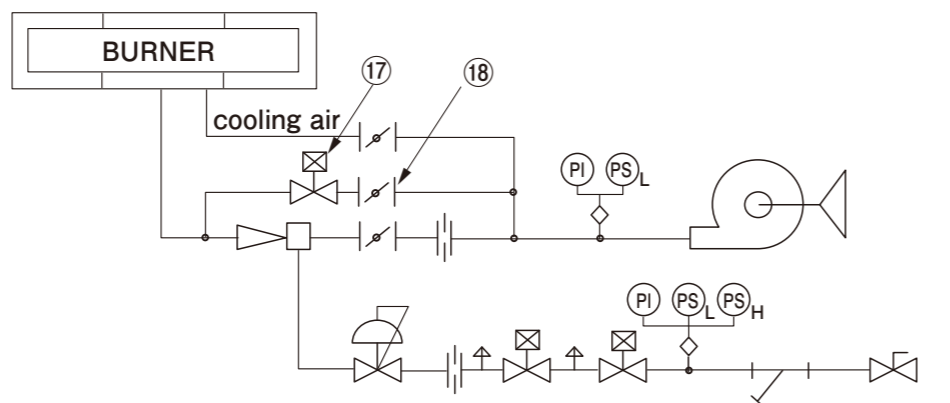
venturi mixer method



low pressure mixer method



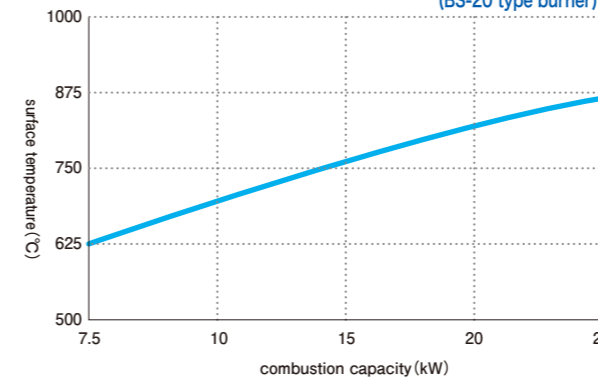
forced air cooling system



No.	name	No.	name	No.	name
1	blower	8	solenoid valve	15	low pressure mixer
2	venturi mixer	9	strainer	16	gas needle valve
3	air butterfly valve	10	gas cock	17	forced air cooling air solenoid valve
4	air orifice	11	air pressure gauge	18	forced air cooling air butterfly valve
5	cooling air butterfly valve	12	air pressure switch	19	check valve
6	zero governor	13	gas pressure gauge		
7	gas orifice	14	gas pressure switch		

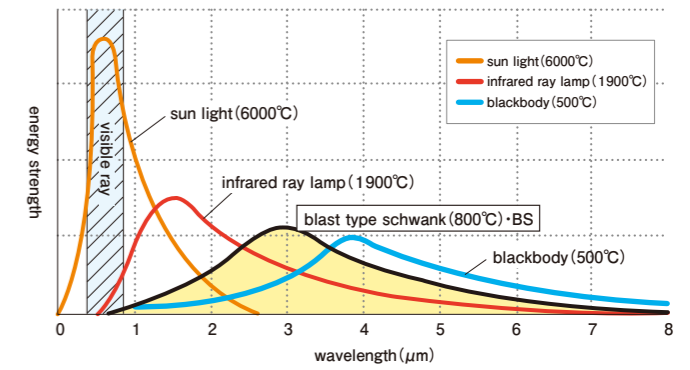
Data(Reference value)

Relationship between input and surface temperature (BS-20 type burner)



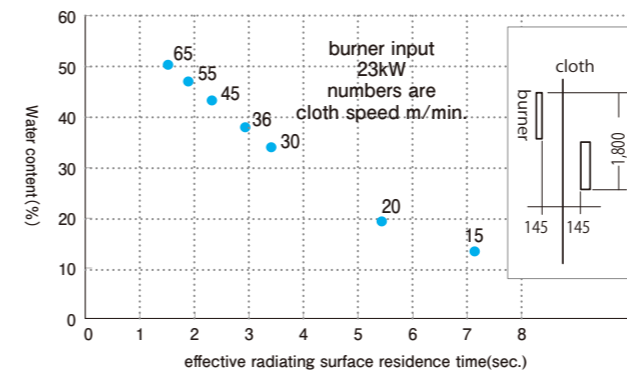
• OPEN combustion ( $\lambda = 1.1$ )

Total radiation strength wavelength feature

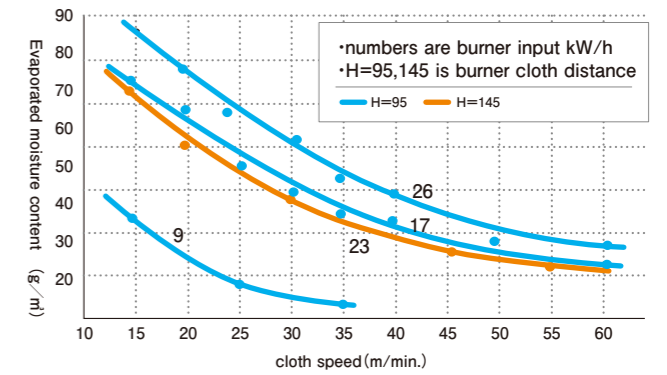


When used for cloth drying with a non-touch dryer

Radiation time - moisture content curve

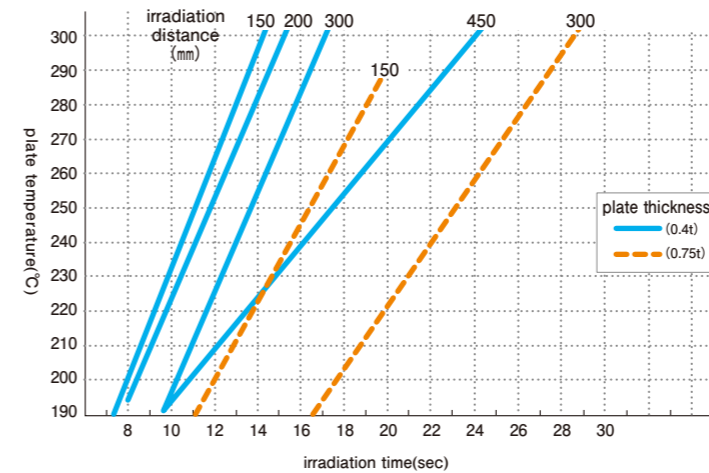


Evaporated moisture content - Combustion capacity - Distance



Powder coated and baked on flat steel plate by flat conveyor type

Irradiation time - plate temperature rise



Others

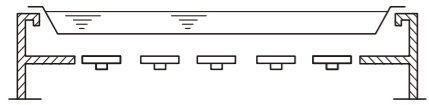
About special made burner

- special made metal fitting
- burner length is longer than BS-30
- Combustion width switching type (with partition)

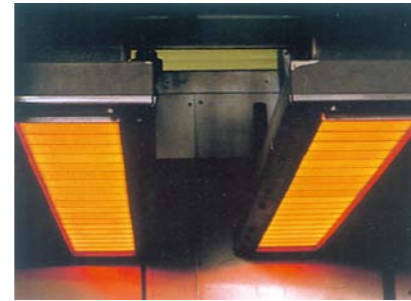
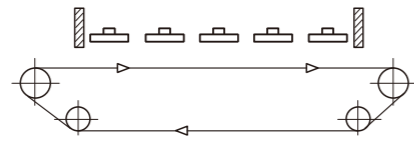
We deal with these requests, so please contact us for details.

## Usage examples

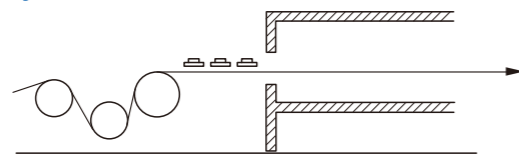
### ● liquid tank heating for flyer etc.



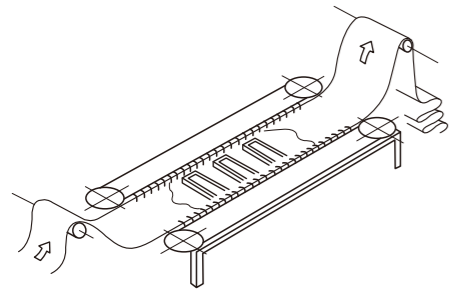
### ● food heating for fish, hamburger steak etc.



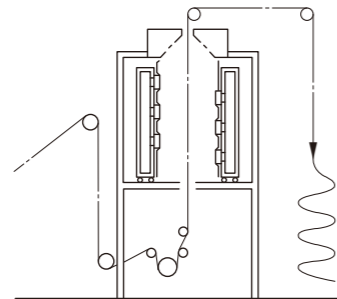
### ● preheating process of dryer.



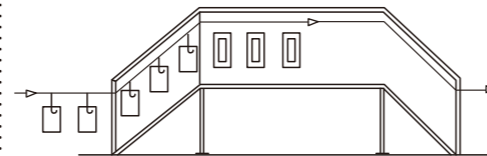
### ● open tenta



### ● non-touch dryer



### ● baking finish of powder and aqueous paint



## Handling Precautions

- 1 It is a safe system by regulating input with gas and air at the orifice.
- 2 If the gas / air mixing ratio (ON) is set to an inappropriate mixing ratio, the flame will stretch, causing incomplete combustion and lowering radiation efficiency. Please burn based on our technical personnel coordination guidance.
- 3 To prevent backfire, please use the burner surface temperature below 800 °C. Be sure to use a filter on the suction port to prevent dust and other contaminants into the burner and cooling blower. Please clean the filter moderately in order to stabilize the combustion state and use it.
- 4 Because of the combustion plate is made of ceramics, please be careful especially when handling it.
- 5 Avoid installing in places with violent vibration.
- 6 Because the defect of the combustion plate and seal part will be the source of flashback, please stop using it promptly.
- 7 Because it may occur the backfire if temperature of the burner surface and the burner body unusually rise by thermal reflection (radiant heat) etc of furnace conditions and processed products, so please be careful that the burner life may decrease remarkably.