Heat recovery type burner

# STBX burner

Heat recovery part: Tip-recovery type
Heat recovery route: Internal reflux path

**STBX-10,20**

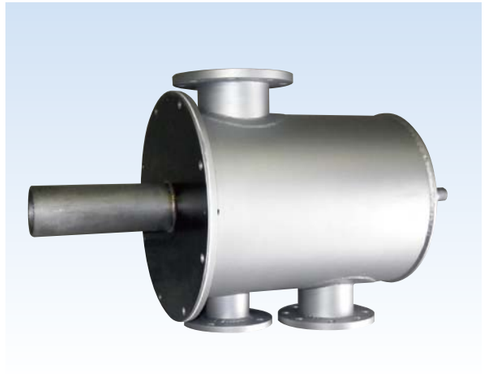


## By installing an external duct, it will demonstrate further energy saving effect.

## Feature

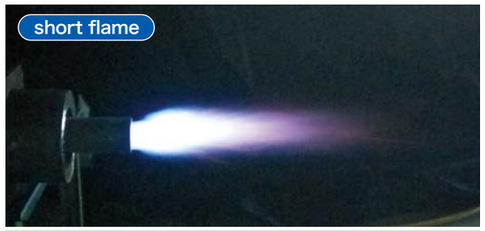
**"The STBX burner is an exhaust heat recovery type burner of "heat exchanger internal organs" that can recover exhaust heat by installing an external duct to the combustion exhaust gas discharged from the furnace body and connecting it to the burner body.**

Regenerative burner, which is an efficient waste heat recovery type burner, is an extremely large investment because it uses special mechanisms and expensive heat resistant members. In industrial furnaces with large combustion consumption, fuel saving is large and it is possible to expect a collection (economic effect) balanced with the investment amount, but in facilities with a small amount of combustion, it takes a very long time until the effect is obtained.



1. STBX burner is slightly inferior to Regenerative burner's Combustion saving ratio (about 40 to 65%, about 25% (*) and the ability is slightly inferior, but the price of the burner is much less expensive.If you replace the conventional burner with STBX and at the same time conduct energy saving repair of the furnace, you can further improve the energy saving rate and initial recovery in a short period becomes possible.
   * It is a result of the combustion test using a crucible furnace in our factory.
2. The exhaust heat flow to be recovered is recovered by branching the flow path from the exhaust duct of the existing furnace and connecting it from the outside of the furnace to the recovery port on the side of the STBX burner. (There is no collection from the tip of the burner.)
3. Built-in heat-resistant metal heat exchanger
4. With a simple structure heat-resistant heat exchanger, it has a structure that is less prone to clogging at low cost, and it is superior in maintainability.

### ● flame





## Main Usage

- Preheating, drying and heat-up of transfer ladle.
- Aluminum alloy melting, holding furnace and crucible furnace.
- Annealing furnace and Metal heating furnace.
- Salt bath furnace etc.

### ● model table

STBX—

| combustion capacity | | gas type | | flame shape | | combustion tube material | |
|---|---|---|---|---|---|---|---|
| signal | Select Specifications | signal | Select Specifications | signal | Select Specifications | signal | Select Specifications |
| 10 | 116kW | N | natural gas(13A) | S | short flame | C | refractory castable combustion tube |
| 20 | 232kW | P | LPG | L | long flame | M | heat resistant metal combustion tube |

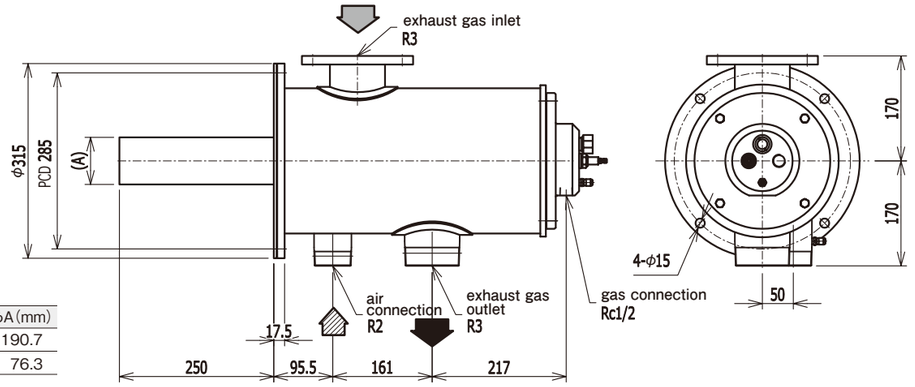
## Specifications

| Model | STBX-10 | STBX-20 |
|---|---|---|
| combustion capacity | 116kW | 232kW |
| standard air ratio | 1.2 | |
| gas inlet pressure | 3.0kPa(standard) | |
| air inlet pressure | 6.5kPa(standard) | |
| air quantity | 132m³N/h | 264m³N/h |
| control method | Hi-Low , Proportional | |
| ignition method | direct ignition | |
| flame supervision method | ultraviolet phototube | |
| turndown ratio | 5:1 | |
| gas type | Natural gas(13A)・LPG | |
| flame shapes | short flame / long flame | |
| combustion chamber temperature | Max.800℃ | |

※Please use the refractory castable if the combustion chamber temperature exceeds 800 ℃.

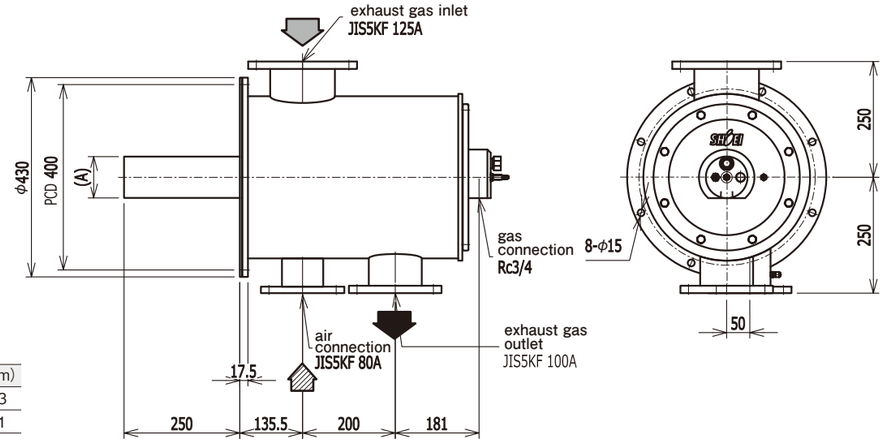
## Overall size

### ≫STBX-10



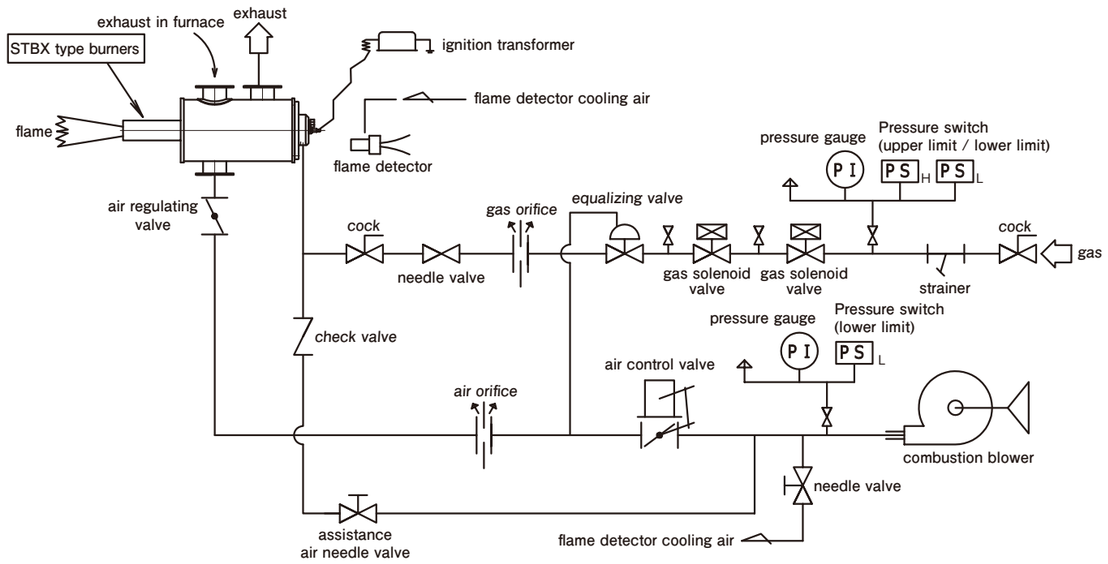

| | φA(mm) |
|---|---|
| refractory castable | 190.7 |
| resistant metal | 76.3 |

### ≫STBX-20



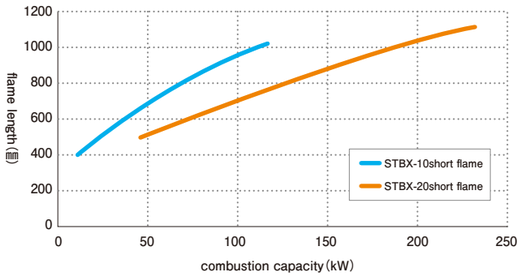

| | φA(mm) |
|---|---|
| refractory castable | 216.3 |
| resistant metal | 89.1 |

## Example of flow sheet



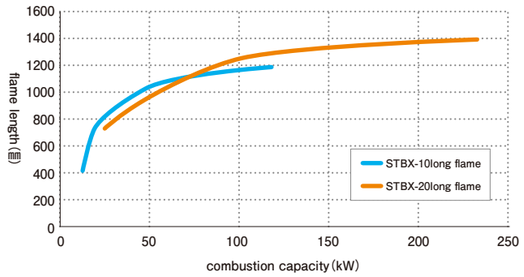

## Relation between flame length and combustion capacity

**short flame**



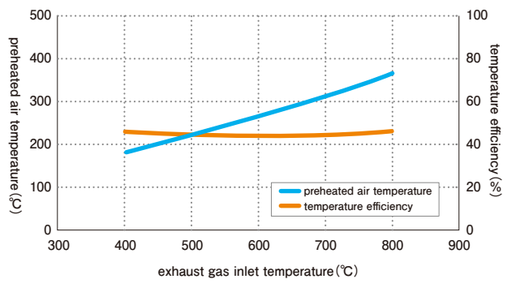

【Measured value by open combustion test】● air ratio：1.2

**long flame**




【Measured value by open combustion test】● air ratio：1.2

## preheated air temperature and temperature efficiency

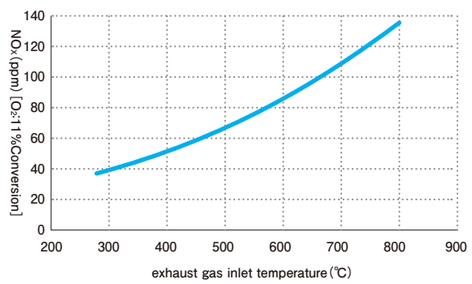



【Combustion condition】
- **burner model**：STBX-10　● **fuel**　：natural gas(13A)
- **flame shape**　：short flame　● **air ratio**：1.2

$$\text{temperature efficiency}(\%) = \frac{\text{preheated air temperature}}{\text{exhaust gas inlet}} \times 100$$

※it is measurement data of test furnace of our company.

## NOx characteristics

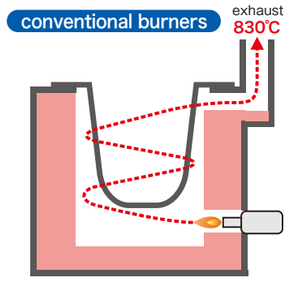



【Combustion condition】
- **burner model**：STBX-10　● **fuel**　：natural gas(13A)
- **flame shape**　：short flame　● **air ratio**：1.2

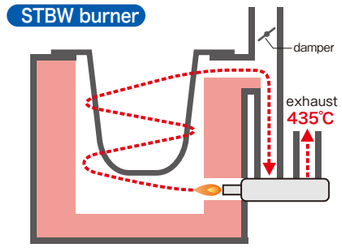
※it is measurement data of test furnace of our company.
※It varies depending on the shape of the combustion chamber etc.

## Comparison with conventional burners

**conventional burners**




**STBW burner**




**Comparison of aluminum dissolution test results of conventional burners and STBX burner.**

● Comparison of tests from normal temperature to melting
melting quantity:115kg／ch

| item | conventional burner | STBX burner |
|---|---|---|
| burner | without heat exchanger | built-in heat exchanger |
| features | ventilation one-path | exhaust reflux duct externally attached |
| first melting time | 2h 52min | 2h 10min |
| shortening of melting time | Conventional standard | 42min |
| exhaust temperature | 830℃ | 435℃ |
| decrease exhaust temperature | Conventional standard | −395℃ |
| unit requirement (Low calorific value standard) | 9.31MJ/kg | 7.1MJ/kg (1,690kcal/kg) |
| energy-saving rate (Gas consumption reduction rate) | Conventional standard | 24.0% |

## Case Examples

### For energy-saving of iron pot furnace and crucible furnace

merit

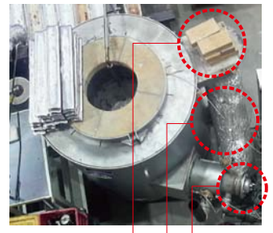
**1. Replace with conventional burner**

The conventional burner of the existing furnace can be exchanged for STBX and can be used as it is, so it can be installed easily and inexpensively.

**2. Utilizing the exhaust duct of the existing furnace**

For exhaust gas heat flow to be recovered, for example, heat is recovered by branching the flow path from the existing furnace flue and connecting it to the recovery port on the side of the STBX burner.

■ **Construction is easy**




## Handling Precautions

1. When connecting to the burner of the external duct, please construct without no load to the burner by heat expansion.
2. Please pay attention so that the load of the external duct is not applied directly to the burner.