

Radiant burner SINNOx



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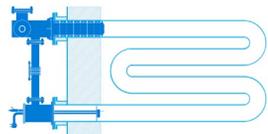
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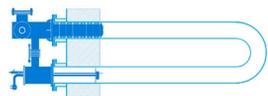
CHARACTERISTICS

- Applicable for the heat treatment furnace indirectly heated by U-shape or W-shape radiant tube.
- The adoption of flue gas reflux and multi-stage combustion technology could reduce the maximum flame temperature and thus significantly reduce the NOx emissions.
- The high-efficiency recuperators could be customized for the different types of furnaces, the waste heat of flue gas could be recovered before leaving the chamber.
- The uniform flame temperature distribution could effectively extend the service life of radiant tube.
- Modular design, facilitating the maintenance of burner.
- Fuel: LPG, COG, natural gas, mixture gas and other fuel gas.

W-shape radiant tube



U-shape radiant tube



APPLICATIONS

SINNOx series burner is applicable for the heat treatment furnace indirectly heated by U-shape or W-shape radiant tube, such as continuous annealing operation line, galvanized operation line, silicon steel production line and other situations which need radiation heating.

CONFIGURATION

SINNOx radiant tube combustion system is composed of 3 major parts including burner, recuperator and connecting tube.

Burner

- The burner is composed of burner insert, air housing and adaptor flange.
- The burner insert is composed of double-flange orifice plate, gas housing, gas pipe and burner head. The self-cooling electrode is installed on the burner insert, single-electrode operation is available. The pilot burner SDB is also optional.
- The air housing is welded by stainless steel. If a thermal insulation is required, the insulation materials could be wrapped outside the air housing.
- The burner is installed on radiant tube by adaptor flange.

Recuperator

- Four types of recuperators are available: single-stage recuperator (H), I-shape double-stage recuperator (HI), L-shape double-stage recuperator (HL) and new compact double-stage recuperator (HS).
- The new double-stage recuperator HS adopts a compact structure. Compared with HL and HI, it not only improves heat transfer efficiency but also greatly saves installation space.
- Built-in flue gas backflow structure and internal counterflow heat exchanger, which maximize the air preheating temperature.

- The fin tube of recuperator is made of heat-resistant cast steel, the fins arranged closely inside and outside the tube increase heat exchange area in limited space and improve the heat exchange efficiency.
- Choose different types of recuperators based on actual energy consumption requirements, as well as the different furnace structures and limitations of installation spaces.

Connecting tube

The connecting tube contains a bellow, through which the mixture of combustion air preheated by recuperator and reflux flue gas flows from the recuperator to the burner.

SPECIFICATION

Parameters

Thermal efficiency

- The thermal efficiency of different recuperator at a furnace temperature of ~ 900 °C and a radiant tube surface heat load of ~ 25 kW · m²: Single-stage recuperator: 65%, L-shape double-stage recuperator: 70%, I-shape double-stage recuperator: 75%, new compact double-stage recuperator: 80%.

NOx emissions

- The NOx content of flue gas at a furnace temperature of ~ 900 °C and a radiant tube surface heat load of ~ 25 kW · m²: normal recuperator: ~ 150 mg · m⁻², and ultra-low NOx recuperator: ~ 80 mg · m⁻².
- Please contact us for lower NOx emissions.

Type table

Burner

Type					SINNOx	90	N	-545	L
Rated capacity/kW	70	90	120	160					
Fuel	N: Natural gas P: LPG T: Town gas M: Mixture gas								
Burner length/mm	445	495	445+50n						
Other	L: Ultra-low NOx emissions								

Recuperator

Type					H	170	A	-545	L
Form	H: Single-stage		HL: L-shape double-stage						
	HI*: I-shape double-stage		HS: Compact double-stage						
Radiant tube diameter	150: 156~160 mm		170: 178~180 mm						
Materials	A: High temperature resistance, can be operated over 950 °C								
Length/mm	445	495	445+50n						
Other	L: Ultra-low NOx emissions								

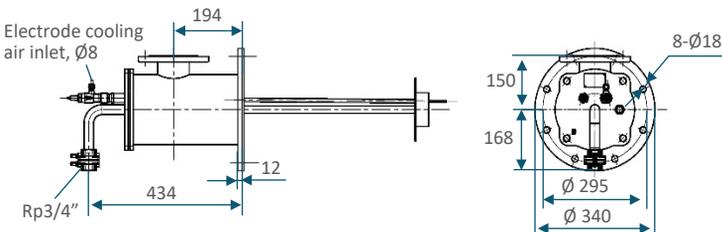
*Two structures types are available for I-shape double-stage recuperators: conventional HI and HI (M). The conventional HI's air inlet is located at the end of the recuperator, while the HI (M)'s air inlet is located in the middle of the recuperator. Different structures can be selected based on the actual need.

The selection of burner capacity should be integrated with furnace temperature, the surface heat load of radiant tube and radiant tube materials.

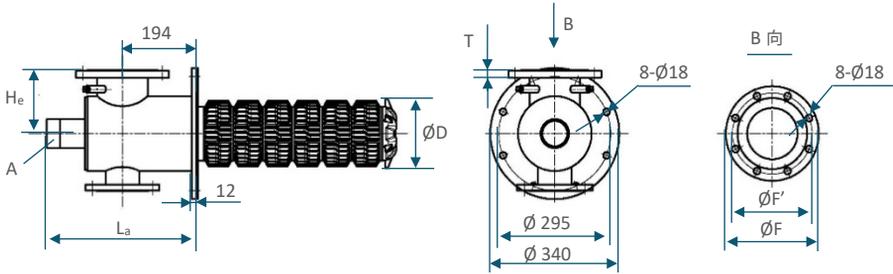
Please contact us for the customization of burner and recuperator length.

Dimensions

The burner SINNOx (mm)

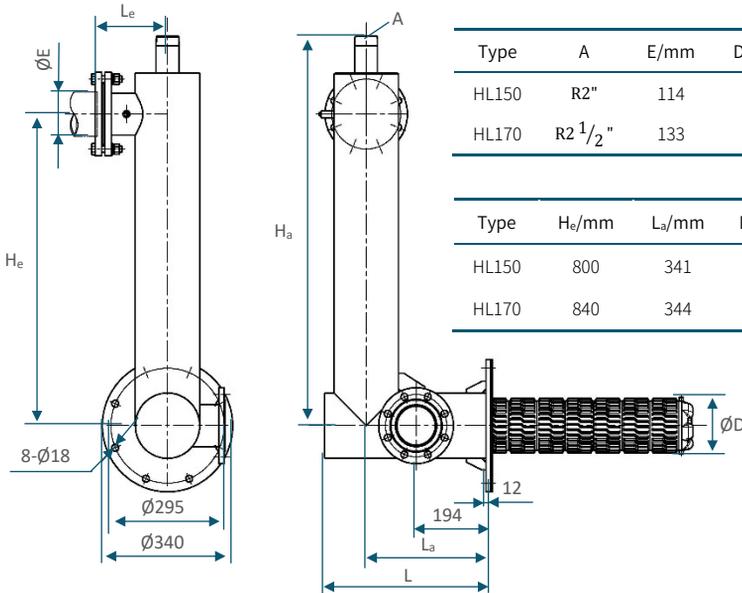


Single-stage recuperator H



Type	A	D/mm	La/mm	He/mm	T/mm	F'/mm	F/mm
H150	R2"	147	354	150	18	180	215
H170	R2 1/2"	174	394	165	20	210	245

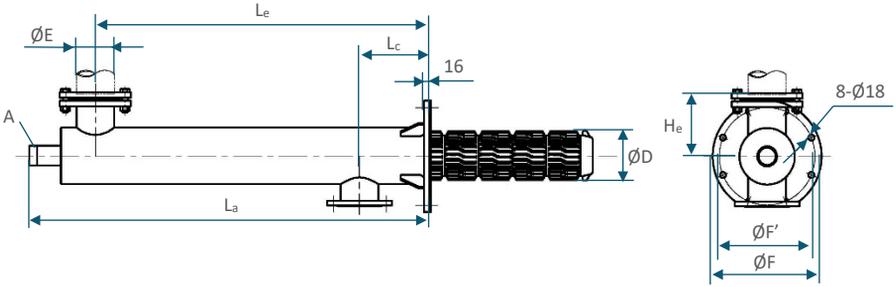
Double-stage recuperator HL



Type	A	E/mm	D/mm	Ha/mm
HL150	R2"	114	147	1000
HL170	R2 1/2"	133	174	1065

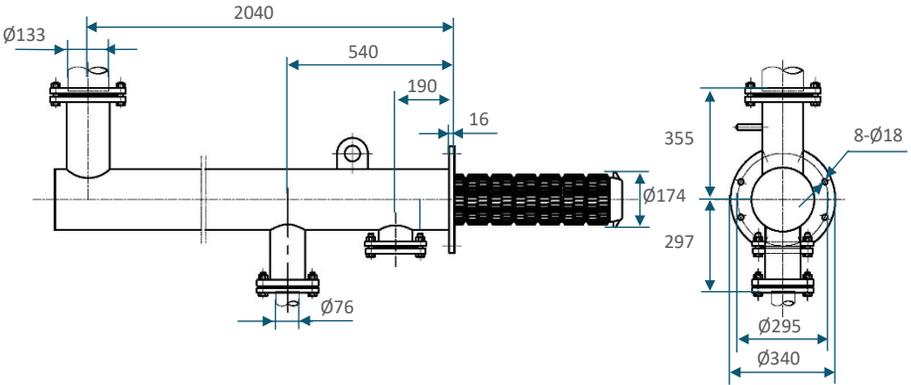
Type	He/mm	La/mm	Le/mm	L/mm
HL150	800	341	188	449
HL170	840	344	225	463

Double-stage recuperator HI

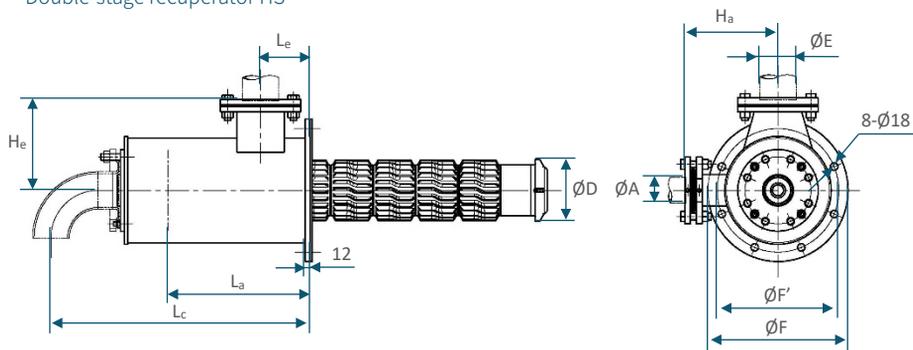


Type	A/mm	E/mm	D/mm	L_a /mm	L_e /mm	L_c /mm	H_e /mm	F'/mm	F/mm
HI150	R2"	114	148	1211	1011	211	188	290	330
HI170	76	133	174	1280	1090	190	190	295	340

Double-stage recuperator HI(M) 170



Double-stage recuperator HS

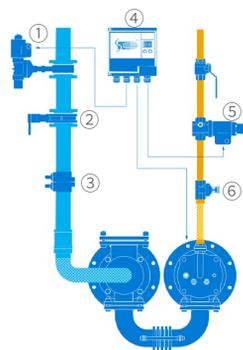


Type	A/mm	E/mm	D/mm	La/mm	Le/mm	Lc/mm	Ha/mm	He/mm	F'/mm	F/mm
HS150	60	89	148	345	120	628	226	221	295	340
HS170	76	133	174	375	150	633	236	270	335	365

The installation flange of the burner and recuperator can be adjusted according to the size of the radiation tube flange. Please consult for details.

SOLUTIONS

- Pulse control: Installing all the valves in the picture and control the burner by ignition burner control unit.
- Double-cross limit continuous control: The gas flow could be reduced while air flow remains constant at a capacity below 40% of the rated and a regulation ratio of 1:5. ① is unnecessary in this control mode. When using pilot burner, the gas shut-off control could be operated by main pipeline system and thus ⑤ is also unnecessary.
- Double-cross limit continuous/pulse control: All the valves in the picture shall be installed, the burner is controlled by double-cross limit continuous mode at a capacity over 40% of the rated and by pulse mode below 40%.



① Air pulse solenoid valve MC..F
+HTB

② Air manual valve SKAH

③ Air double-flange orifice plate

④ Burner control unit SCU 4.1

⑤ Gas solenoid valve SG

⑥ Manual linear flow control KV

INSTALLATION

- To ensure the accuracy of orifice plate measurement, the pipe connected to the air inlet on burner must be straight in the length of 5*DN without other resistance elements.
- To facilitate the checking and maintenance, prohibit covering the mounting flanges while wrapping insulation materials on the outer surface of recuperator and connecting tube.
- Electrode with cooling air is installed by default. The connection of cooling air is a Ø8 ferrule fitting. Suggest to intake the cooling air at the upstream of air shut-off valve.

OPERATION

Attention

- The SINNOx shall be operated at an excess air coefficient over 1.05 and prohibit working in a reductive atmosphere.
- To avoid leakage, the screws on the flanges of burner must be tightened again after the burner being installed and heating the furnace for the first time.
- Monitor the flue gas data, prevent the burner from working in a reductive atmosphere.

Maintenance

- Checking and cleaning the burner and electrode regularly, at least once every six months.
- Increase the times of maintenance, as appropriate.