

Conventional burner SCEC



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CHARACTERISTICS

- SCEC series burners are sub-high velocity burners with forced air supply.
- Capacity range: 30~1000 kW.
- Fuel: natural gas, LPG, town gas, COG, mixed gas and low calorific value gas, etc.
- Non-premixing burner, air and gas are supplied separately, no flareback.
- Flame shape: short flame, long flame and flat flame, optional.
- Suitable for most of the furnaces need direct heating.

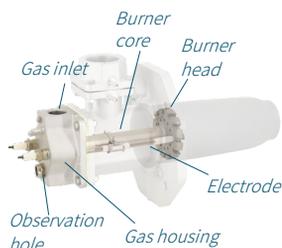
APPLICATIONS

SCEC series gas burners can meet the needs of direct heating or heat treatment in various industries such as iron and steel, non-ferrous metal, machinery, forging, glass, ceramic, and food processing industries. It can also be used as a safety burner.

CONFIGURATION

Burner insert

The burner insert of SCEC is composed of a gas housing and a burner core. The gas housing is equipped with a gas orifice plate (The orifice plate has been installed on SCEC 50~140 by default, while needs to be ordered and installed separately on SCEC 165~200), pressure test nipples, an observation hole, a ground screw and other accessories. The burner core is composed of a gas pipe and a burner head, which is used for mixing the gas and air and stabilizing the flame. Electrodes are installed on the burner insert, and double-electrode flame ignition/detection is adopted generally.



Air housing

The air housing is used for the diversion and distribution of air, a burner insert and a flame guide tube are installed on it. The burner is installed on the furnace wall through the mounting flange. The air inlet is equipped with an orifice plate (the aluminum type of air housing needs to be ordered separately) for air flow measurement.



Ceramic burner tube

The SCEC series use SiC ceramic tubes instead of burner blocks as combustion chamber to ensure the stability of burning and the shape of flame.

Flame guiding tube

The total length of burner is related to the thickness of the insulation on furnace wall. When the burner needs to be lengthened, a metal flame guide tube is added, and the ceramic burner tube is installed on the flame guide tube. The base length of flame guide tube is 100 mm, and increases by integral multiple of 50 mm.



SPECIFICATION

Parameters

Flame parameters

Flame shape	Code	Hot air/°C	Furnace temperature /°C	Turndown ratio	Excess air factor **
Long	L	20~450	500~1600	1:10	0.8~1.5
Short	S	20~150*	50~1350	1:10	0.8~1.3

* When the S-type burner is used for pulse control, the air temperature is up to 150 °C, and the ceramic tube needs to be recrystallized SiC tube. For continuous control or higher air temperature, a burner block is needed, see SCEM series for details.

** Under high capacity.

Size	Outlet diameter /mm	Capacity /kW	Flame shape	Visible flame length /mm	Outlet velocity /m · s ⁻¹
50	028	30	S	160	105
50	028	30	L	200	95
50	035	35	S	200	75
50	035	35	L	240	70
50	045	40	S	300	53
50	045	40	L	500	48
65	033	50	S	220	125
65	033	50	L	270	115
65	040	60	S	250	100
65	040	60	L	330	95
65	048	70	S	300	80
65	048	70	L	400	75
65	058	90	S	500	68
65	058	90	L	600	63
80	040	90	S	400	150
80	040	90	L	500	145
80	050	105	S	400	115
80	050	105	L	500	105
80	065	120	S	450	75
80	065	120	L	600	65
80	077	150	S	600	73
80	077	150	L	700	68

Size	Outlet diameter	Capacity	Flame shape	Visible flame	Outlet velocity
	/mm	/kW		length /mm	/m · s ⁻¹
100	065	160	S	450	100
100	065	160	L	600	95
100	082	180	S	500	75
100	082	180	L	650	65
100	094	230	S	700	73
100	094	230	L	800	68
125	075	230	S	600	110
125	075	230	L	800	105
125	100	260	S	700	75
125	100	260	L	1000	65
125	116	320	S	1000	63
125	116	320	L	1150	58
140	070	270	S	400	150
140	070	270	L	600	140
140	085	320	S	600	120
140	085	320	L	800	115
140	120	360	S	800	70
140	120	360	L	900	60
140	130	450	S	1100	84
140	130	450	L	1300	78
165	120	400	S	900	78
165	120	400	L	1300	73
165	140	500	S	1000	72
165	140	500	L	1500	67
165	156	630	S	1100	73
165	156	630	L	1600	68
200	165	800	S	1200	80
200	165	800	L	1800	75
200	181	1000	S	1300	82
200	181	1000	L	2000	77

The data above is based on natural gas in atmospheric environment, the excess air coefficient is 1.15.

The burner capacity is calibrated by the gas chemical heat without the physical heat caused by air preheating.

The visible flame length is related to the environment brightness, for reference only.

The flame diameter is less than 1.5 times of outlet diameter of the SiC ceramic tube.

When measuring the flame outlet velocity, the flame temperature of long flame is 1400 °C, and the flame temperature of short flame is 1500 °C.

Type table

40~1000kW

Type	SCEC	(l)	100	L	N	-100	/135
Supplement	I: Internal insulation A: Aluminum air housing						
Size	50	65	80	100			
	125	140	165	200			
Flame shape	L: Long S: Short						
Fuel	N: Natural gas P: PLG T: Town gas M: Mixed gas						
Flame guide tube length	0*	100	150	100+50n			
Burner core length	35	85	135	35+50n			

* 0 means no flame guide tube.

When using mixed gas as fuel, the maximum capacity of the burner is about 70% of the rated capacity.

Dimensions

Flame guide tube

$L_3=0\text{mm}, 100\text{mm}, 150\text{mm}, 200\text{mm}, 250\text{mm}\dots$

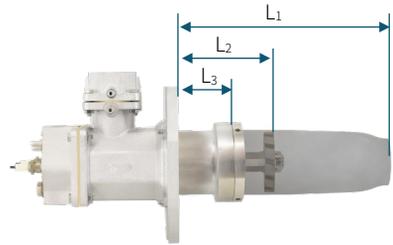
SiC ceramic tube

$L_1-L_3=200\text{mm}, 250\text{mm}, 300\text{mm}, 350\text{mm}$

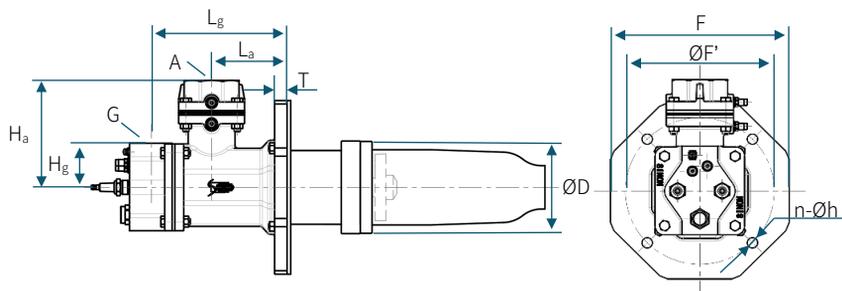
Burner core

The length of L_2 must match L_1 , the value of L_1-L_2 must meet the following table:

Flame shape	50	65	80~100	125~200
S	265	165 ~ 265	215 ~ 265	265
L	265	165 ~ 265	215 ~ 265	265



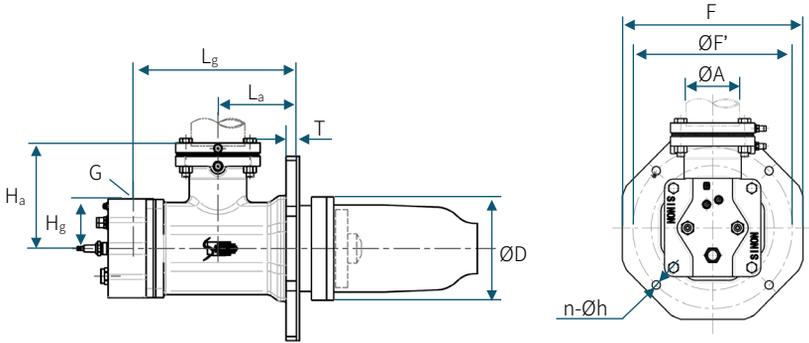
After installation, the end of the SiC ceramic tube should be flush with the insulation materials on the furnace wall or the distance between the end of tube and the inner surface of insulation materials should not exceed 50mm.



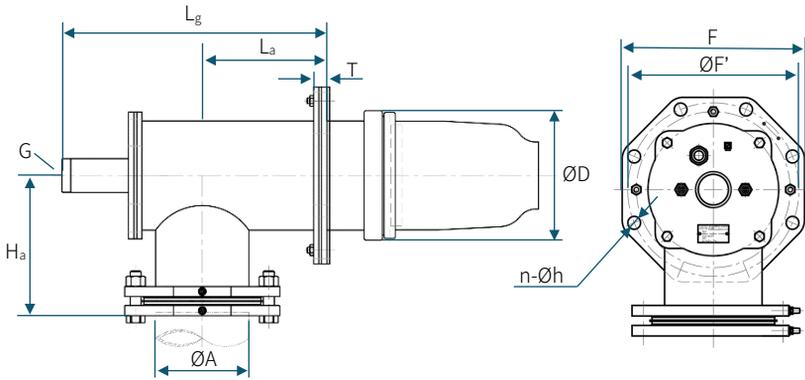
Size	Capacity /kW	A	G	D/mm	H_a /mm	H_g /mm	L_a /mm
50	40	Rp1 1/2"	Rp1 1/2"	86	114	38	73
65	90	Rp1 1/2"	Rp3/4"	96	124	49	73
80	150	Rp2"	Rp3/4"	114	148	61	90
100	230	Rp2"	Rp1"	128	152	61	103
125	320	Rp2 1/2"	Rp1 1/2"	158	191	73	119

Size	L_g /mm	F/mm	F' /mm	T/mm	h/mm	n
50	148	180	151	12	12	4
65	154	195	165	12	12	4
80	177	240	210	14	14	4
100	185	240	200	17	14	4
125	254	270	240	17	14	4

SCEC 140 (ordinary housing)



SCEC 165~200 (ordinary housing)

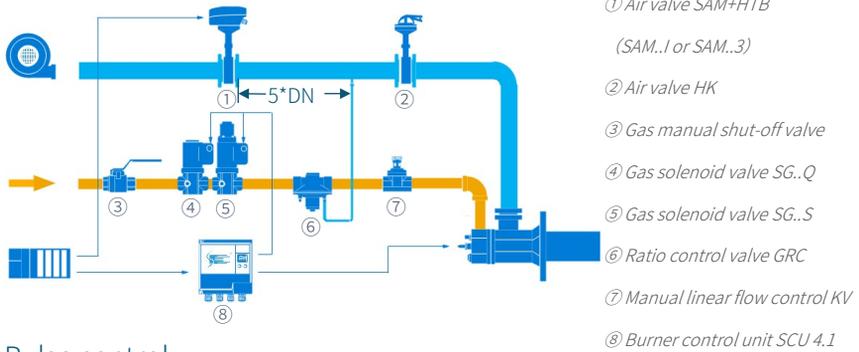


Size	Capacity /kW	A/mm	G	D/mm	H _a /mm	H _g /mm	L _a /mm
140	450	89	Rp1 1/2"	168	172	81	130
165	630	114	R1 1/2"	200	248	N/A	166
200	1000	168	R2"	230	249	N/A	225

Size	L _g /mm	F/mm	F'/mm	T/mm	h/mm	n
140	270	300	265	17	14	4
165	369	240	240	24	14	4
200	478	314	295	24	22	8

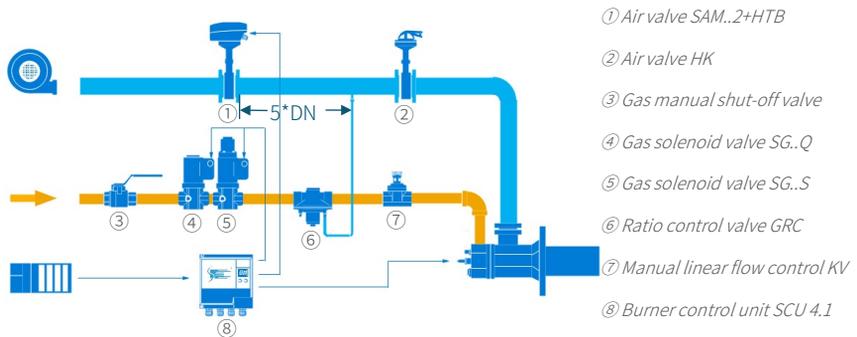
SOLUTIONS

Continuous control

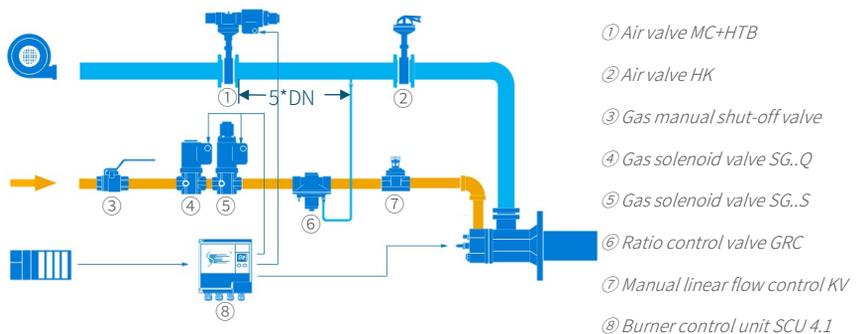


Pulse control

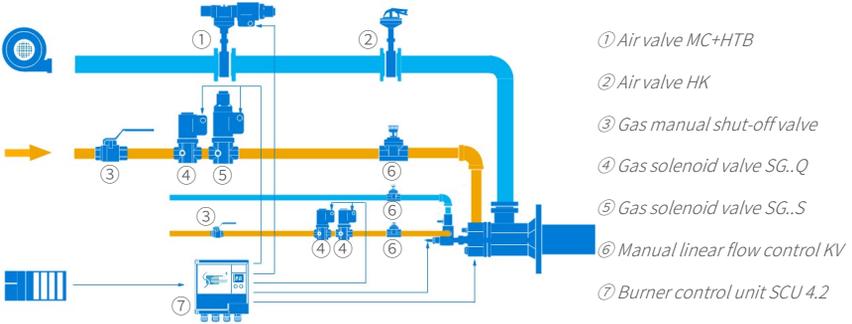
Example 1



Example 2



Example 3



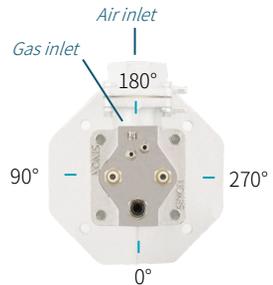
INSTALLATION

Burner

- Support the insulation materials on the furnace wall to prevent the deformation of the insulation materials from squeezing the ceramic combustion chamber.
- Fill the installation hole of burner with insulation materials. The insulation materials must not exceed the head of the burner core to prevent the flame from overtemperature.
- If the flame outlet of burner is installed inside the insulation of furnace wall, the insulation near the flame outlet needs to be carved with a 45° expansion angle.

Pipeline

- Based on the direction of air joint, the gas joint of SCEC can be adjusted to an angle of 90°, 180° and 270° as shown as the picture.
- Cast iron housing series SCEC 50~200 is equipped with an air orifice plate, SCEC 50~140 are equipped with a gas orifice plate, other types need to order orifice plate separately.



- The length of straight pipe section before the orifice plate should be longer than $5 \cdot DN$ without other resistance elements.
- Before the pipe is connected to the burner, it must be purged to prevent welding slag or other debris from entering the burner and affecting the normal operation of the burner. If you need to weld after installation, make sure that no welding slag or molten materials falls into the pipe or the burner during welding.

OPERATION

Attention

- Choose the burner specifications reasonably to avoid using the burner beyond its capacity range or air/fuel ratio range.
- When drying the furnace with external heat source, the air blower must be turned on to ensure that there is more than 5% of air flows in to prevent furnace chamber gas backflow, internal condensation or other conditions affecting the burner.
- If the burner needs to be shut off during operation, keep the air blower operating to ensure that there is more than 5% of air enters the furnace to prevent the damage caused by furnace chamber hot gas backflow.
- Regularly check and clean the burner and electrode, and check the combustion state of burner.

Conne- tion	Pressure/mbar
Air	50
Gas	50