

Products

Gas direct-fired heating units



Product Series

Gas Direct-fired Heating Units (top heat recovery)

Model: AirTS-GD

Suitable for heating high & large spaces. It uses direct combustion of gas in the coil to heat the air. It has high heat exchange efficiency and it is simple to install. It can infinitely adjust the heating capacity and can start and stop at any time. It does not require anti-freeze measures. It has full combustion, environmentally friendly emissions, and multiple prevention and control measures, safe and reliable.



Gas Direct-fired Heating Units (fresh air/top heat recovery)

Model: AirTS-GFD

It is suitable for large space heating, and the air is heated by direct combustion of gas in coil pipes. It integrates heating and fresh air functions, and fresh air volume can be adjusted to achieve mixing air or fresh air operation. It is characterized by high heat exchange efficiency, easy installation, infinite regulating of heating capacity, start and stop at any time, no need for anti-freezing measures, full combustion, environment protection emission, multiple prevention and control measures, safety and reliability.



Gas Direct-fired Heating Units (side-mounting)

Model: AirTS-GS

It can be embedded into outdoor walls or installed indoors. The side supply air mode is used, and the air is heated by direct combustion of gas in coil pipes. It is characterized by high heat exchange efficiency, infinite regulating of heating capacity, start and stop at any time, no need for anti-freezing measures, full combustion, environment protection emission, multiple prevention and control measures, safety and reliability.



Gas Direct-fired Heating Units (roof heat recovery)

Model: AirTS-GT

It can be used on a roof and can input outdoor fresh air. It is suitable for High&Large space heating, and the air is heated by direct combustion of gas in coil pipes. It is characterized by high heat exchange efficiency, easy installation, infinite regulating of heating capacity, start and stop at any time, no need for anti-freezing measures, full combustion, environment protection emission, multiple prevention and control measures, safety and reliability.



Gas Direct-fired Heating Units (fresh air/roof heat recovery)

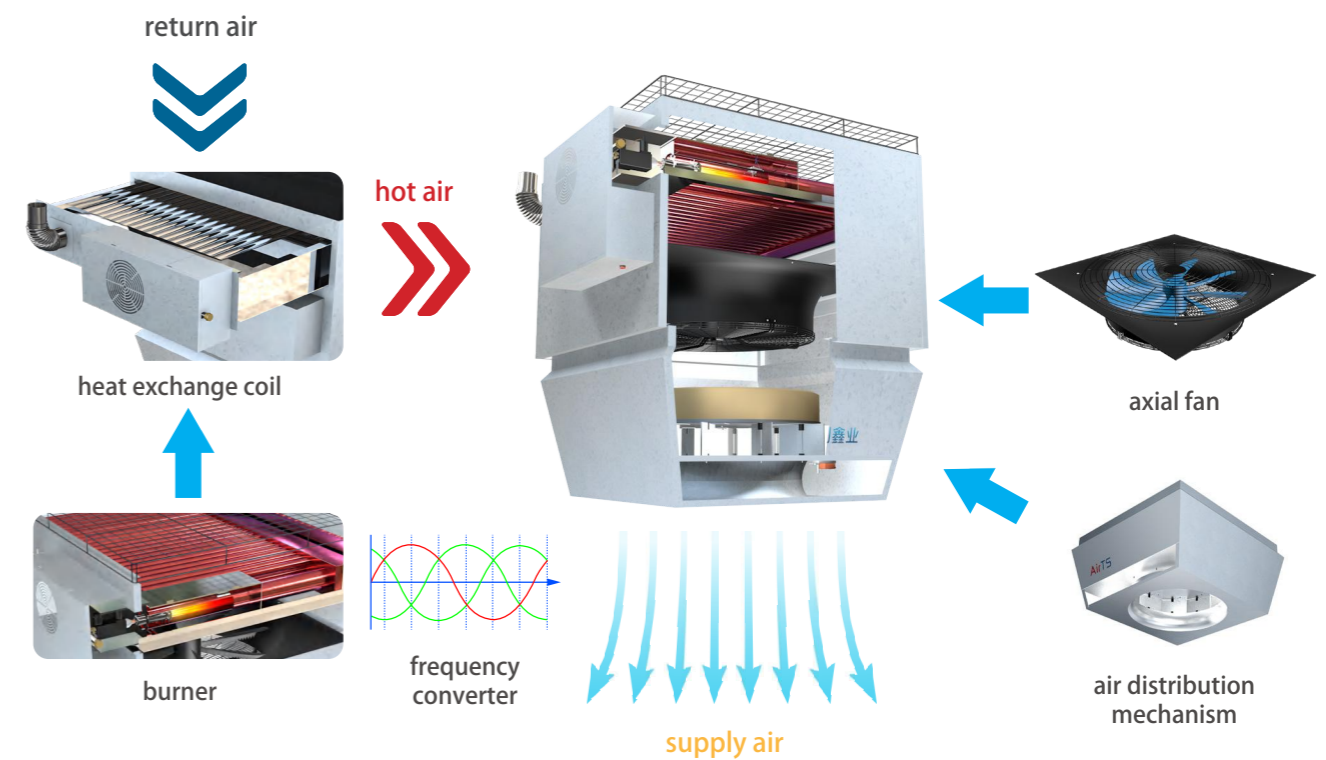
Model: AirTS-GFT

It can be used on a roof and can input outdoor fresh air. It is suitable for large space heating, and the air is heated by direct combustion of gas in coil pipes. It integrates heating and fresh air functions, and fresh air volume can be adjusted to achieve mixing air or fresh air operation. It is characterized by high heat exchange efficiency, easy installation, infinite regulating of heating capacity, start and stop at any time, no need for anti-freezing measures, full combustion, environment protection emission, multiple prevention and control measures, safety and reliability.




Working Principle


Natural gas is burned with mixed air through the burner, and the heat passes through the heat exchange coil. The axial flow fan provides power to make the top return air take away the heat through the heat coil. After two pressure boosts and silencers, it is sent to the floor for heating area.



Technical Specifications

AirTS-GD		Gas Direct-fired Heating Units (top heat recovery)	
		Model	AirTS-GD
Fan speed	r/min	0~860	
Standard circulating air volume	m ³ /h	0~10600	
Voltage	V	380±5%	
Electric power	kW	0~1.85	
Current	A	0~3.9	
Suitable installation height	m	4~17	
Control mode		Infinite regulation of variable gas volume and wind speed	
Heating capacity	kW	0~54.75	
Air consumption	m ³ /h	5.21 (working condition) 5.64 (standard condition)	
Thermal efficiency	η	98.9%	
Noise	dB	<60	
Supply gas pressure	kPa	5~10	
Working pressure	kPa	2	

* If the installation height is beyond the scope of application, please contact the manufacturer to customize a non-standard model.

AirTS-GFD		Gas Direct-fired Heating Units (fresh air/top heat recovery)	
		Model	AirTS-GFD
Fan speed	r/min	0~860	
Standard circulating air volume	m ³ /h	0~8700	
Voltage	V	380±5%	
Electric power	kW	0~1.91	
Current	A	0~4.2	
Suitable installation height	m	4~16	
Control mode		Infinite regulation of variable gas volume and wind speed	
Heating capacity	kW	0~54.75	
Air consumption	m ³ /h	5.21 (working condition) 5.64 (standard condition)	
Thermal efficiency	η	98.9%	
Noise	dB	<60	
Supply gas pressure	kPa	5~10	
Working pressure	kPa	2	

* If the installation height is beyond the scope of application, please contact the manufacturer to customize a non-standard model.

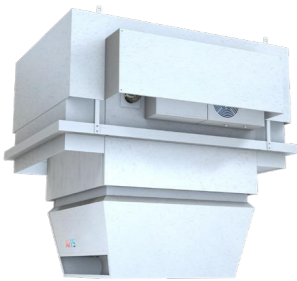
Unit size		
Model		AirTS-GD
A	mm	1100
B	mm	1385
C	mm	850
E	mm	100
F	mm	150
H	mm	935
J	mm	170
K	mm	120
M	mm	DN80
N (male elbow)	mm	DN20
Weight	kg	240

※ If you have more non-standard requirements, please consult with our sales or technical personnel.

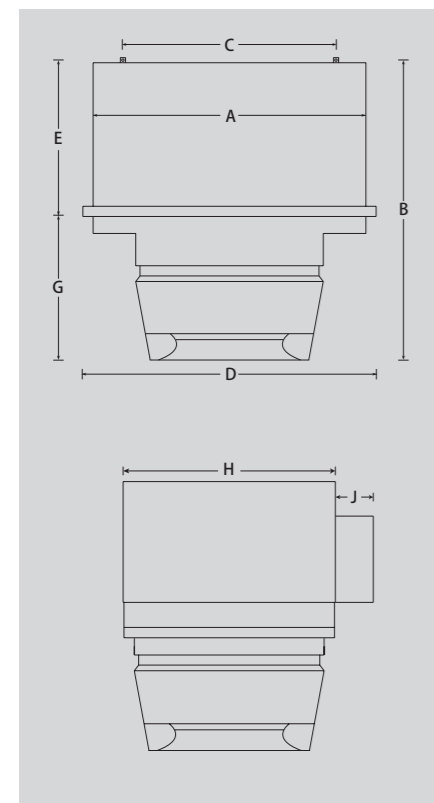
Unit size		
Model		AirTS-GFD
A	mm	1100
B	mm	1840
C	mm	850
E	mm	100
F	mm	540
H	mm	935
J	mm	170
K	mm	120
M	mm	DN80
N (male elbow)	mm	DN20
O	mm	550
P	mm	600
R	mm	455
T	mm	75
M	mm	642
Weight	kg	263

• Notes: The above sizes and weight are corresponding to single burner (54.75kW).
 • There are optional items for dual fuel burner (109.5kW) and three-slot burner (164.25kW).
 • It is recommended to use a dual fuel burner or three-slot burner configuration in cold areas.
 • Each additional set of burners:
 • Height B increase: 400mm
 • Weight increase: 83kg
 • Gas consumption increase: 5.21m³/h
 • Power consumption increase: 75W

Technical Specifications

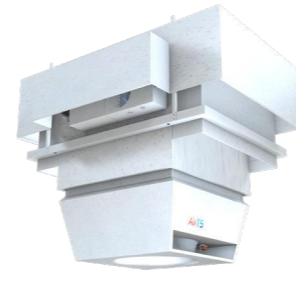
AirTS-GT		Gas Direct-fired Heating Units (roof heat recovery)	
		Model	AirTS-GT
Fan speed	r/min	0~860	
Standard circulating air volume	m ³ /h	0~10200	
Voltage	V	380±5%	
Electric power	kW	0~1.87	
Current	A	0~4.0	
Suitable installation height	m	4~17	
Control mode		Infinite regulation of variable gas volume and wind speed	
Heating capacity	kW	0-56.18	
Air consumption	m ³ /h	5.21 (working condition) 5.73 (standard condition)	
Thermal efficiency	η	99.9%	
Noise	dB	<60	
Supply gas pressure	kPa	5~10	
Working pressure	kPa	2	

* If the installation height is beyond the scope of application, please contact the manufacturer to customize a non-standard model.

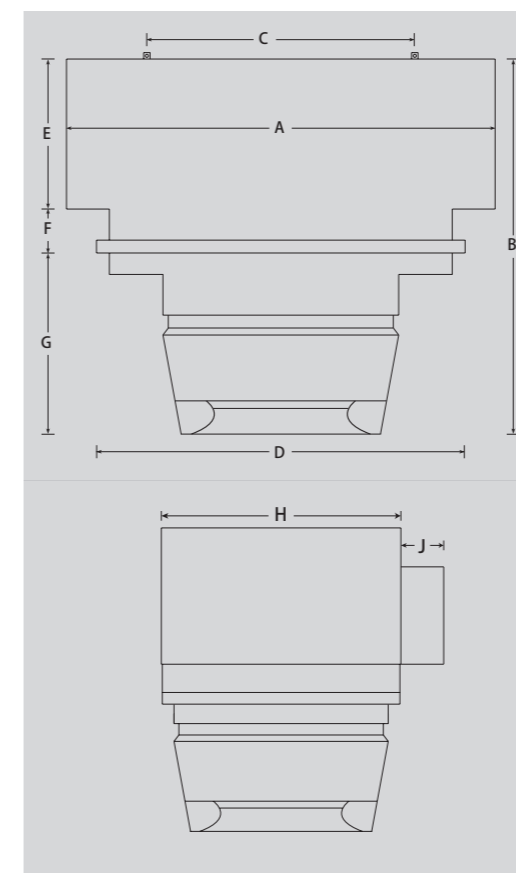


Unit size		
Model		AirTS-GT
A	mm	2000
B	mm	1760
C	mm	1250
D	mm	1720
E	mm	905
G	mm	855
H	mm	1230
J	mm	220
Inlet air pipe (male elbow)	mm	DN20
Exhaust pipe	mm	DN80
Weight	kg	320

※ If you have more non-standard requirements, please consult with our sales or technical personnel.

AirTS-GFT		Gas Direct-fired Heating Units (fresh air/roof heat recovery)	
		Model	AirTS-GFT
Fan speed	r/min	0-860	
Standard circulating air volume	m ³ /h	0-10000	
Voltage	V	380±5%	
Electric power	kW	0-1.91	
Current	A	0-4.2	
Suitable installation height	m	4-17	
Control mode		Infinite regulation of variable gas volume and wind speed	
Heating capacity	kW	0-56.18	
Air consumption	m ³ /h	5.21 (working condition) 5.73 (standard condition)	
Thermal efficiency	η	99.9%	
Noise	dB	<60	
Supply gas pressure	kPa	5~10	
Working pressure	kPa	2	

* If the installation height is beyond the scope of application, please contact the manufacturer to customize a non-standard model.




Unit size		
Model		AirTS-GFT
A	mm	2000
B	mm	1760
C	mm	1250
D	mm	1720
E	mm	700
F	mm	205
G	mm	855
H	mm	1230
J	mm	220
Inlet air pipe (male elbow)	mm	DN20
Exhaust pipe	mm	DN80
Weight	kg	351

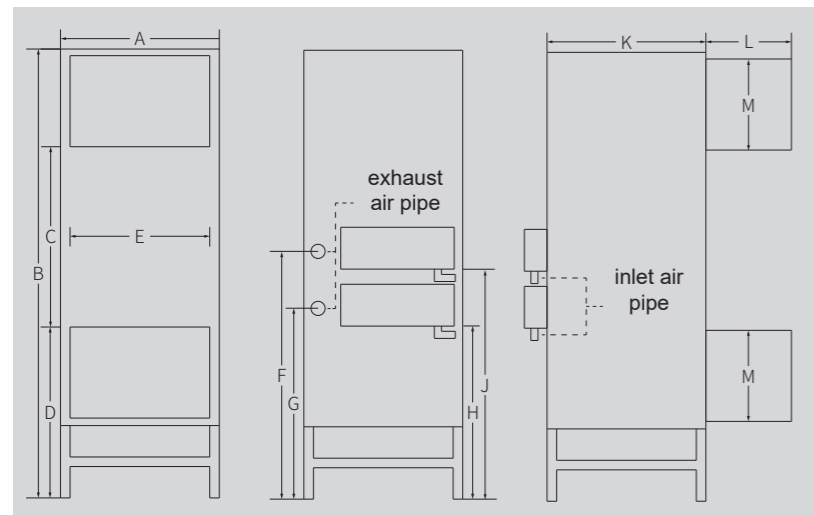
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- Notes: The above sizes and weight are corresponding to single burner (54.75kW).
- There are optional items for dual fuel burner (109.5kW) and three-slot burner (164.25kW).
- It is recommended to use a dual fuel burner or three-slot burner configuration in cold areas.
- Each additional set of burners:
 - Height B increase: 400mm
 - Weight increase: 83kg
 - Gas consumption increase: 5.21m³/h
 - Power consumption increase: 75W

Technical Specifications

AirTS-GS		Gas Direct-fired Heating Units (side-mounting)	
		Model	AirTS-GS
Fan speed	r/min	0~860	
Standard circulating air volume	m ³ /h	0~12500	
Voltage	V	380±5%	
Electric power	kW	0~2.93	
Current	A	0~5.45	
Suitable installation height	m	<30	
Control mode		Infinite regulation of variable gas volume and wind speed	
Heating capacity	kW	0~104.31	
Air consumption	m ³ /h	10.29 (working condition) 11.14 (standard condition)	
Thermal efficiency	η	96.0%	
Noise	dB	<65	
Supply gas pressure	kPa	5~10	
Working pressure	kPa	2	

* If the installation height is beyond the scope of application, please contact the manufacturer to customize a non-standard model.



※ If you have more non-standard requirements, please consult with our sales or technical personnel.

Unit size		
Model		AirTS-GS
A	mm	1120
B	mm	3165
C	mm	1361
D	mm	1157
E	mm	985
F	mm	1632
G	mm	1300
H	mm	1220
J	mm	1622
K	mm	1120
L	mm	603
M	mm	642
Inlet air pipe (male elbow)	mm	DN20
Exhaust pipe	mm	DN80
Weight	kg	510

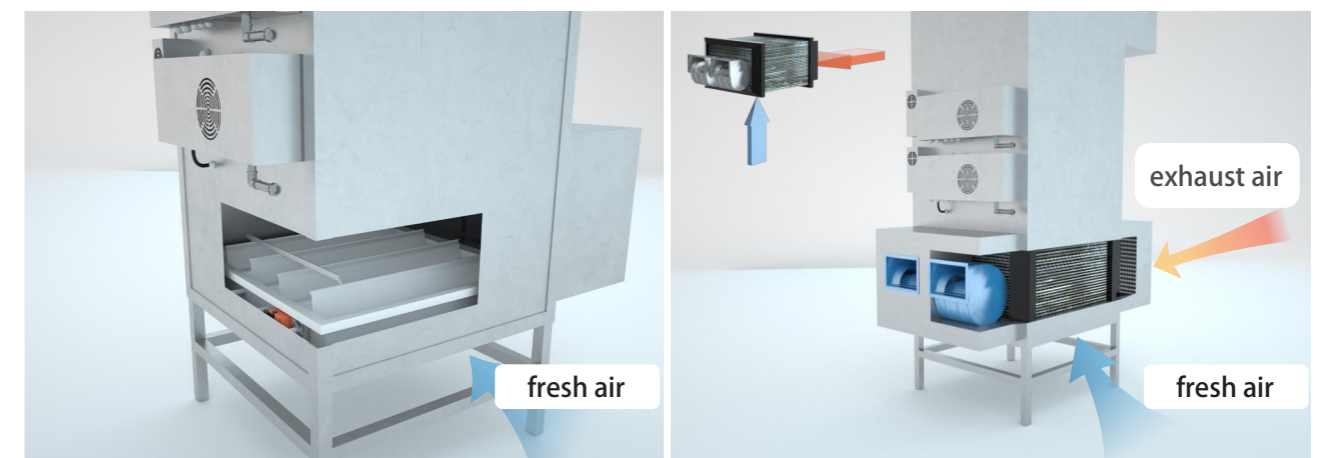
Installation diagram of side vertical direct-fired heating unit



Installation view--outdoor

Installation view--indoor

Two optional functions



Optional function of fresh air

Optional function of fresh air, exhaust air and total heat exchange

Technical Comparison

Gas direct heating units VS traditional heating units (System configuration)

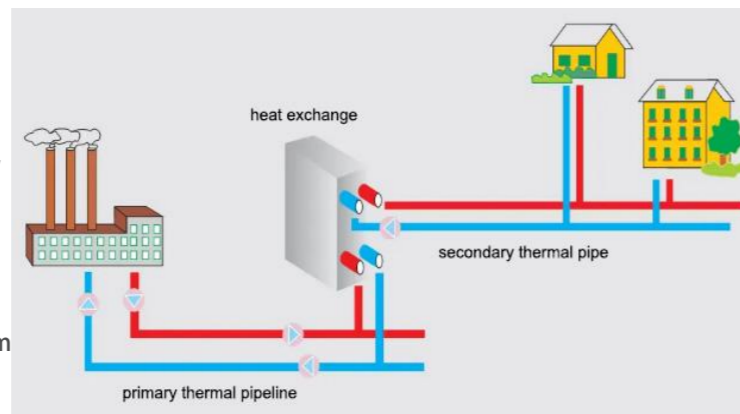
System configuration of gas direct heating units

1. Energy source: natural gas, electricity
2. Civil engineering requirements: none (does not occupy effective space)
3. Personnel requirements: unattended system
4. System configuration: gas heating unit



System configuration of traditional heating unit and problem

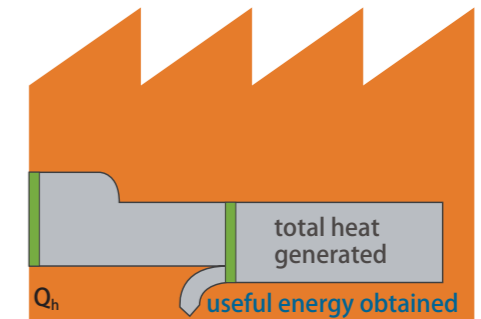
1. Energy source: water, electricity, natural Gas
2. Civil engineering requirements: boiler room or heat exchange station
3. Personnel requirements: furnace worker, maintenance worker
4. System configuration: gas boiler or thermal power plant, circulating water pump, primary and secondary circulating water network, heat exchanger, boiler room or heat exchange station, water tank, etc.



Gas direct heating units VS water systems

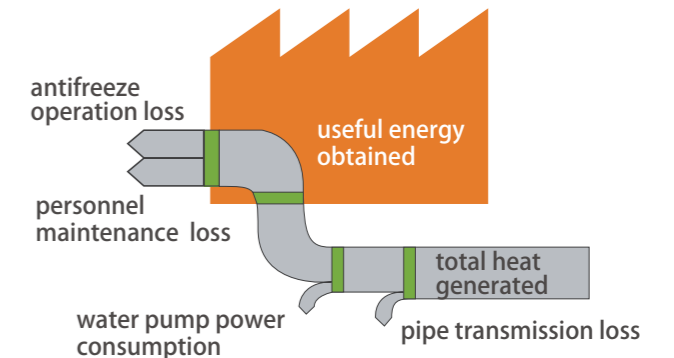
The water heating system as follows:

1. High initial investment - complex system and many equipment
2. High operating costs - 30-40% of non-heating ineffective losses
3. High maintenance cost - more equipment, more failure points, high failure rate



The gas heating system as follows:

1. Low initial investment - 20% lower initial investment compared to traditional methods
2. Low operating costs - direct heating, waterless system saves 40% of operating costs
3. Low maintenance cost - simple system and low failure rate



Compare with fuel gas radiation heating

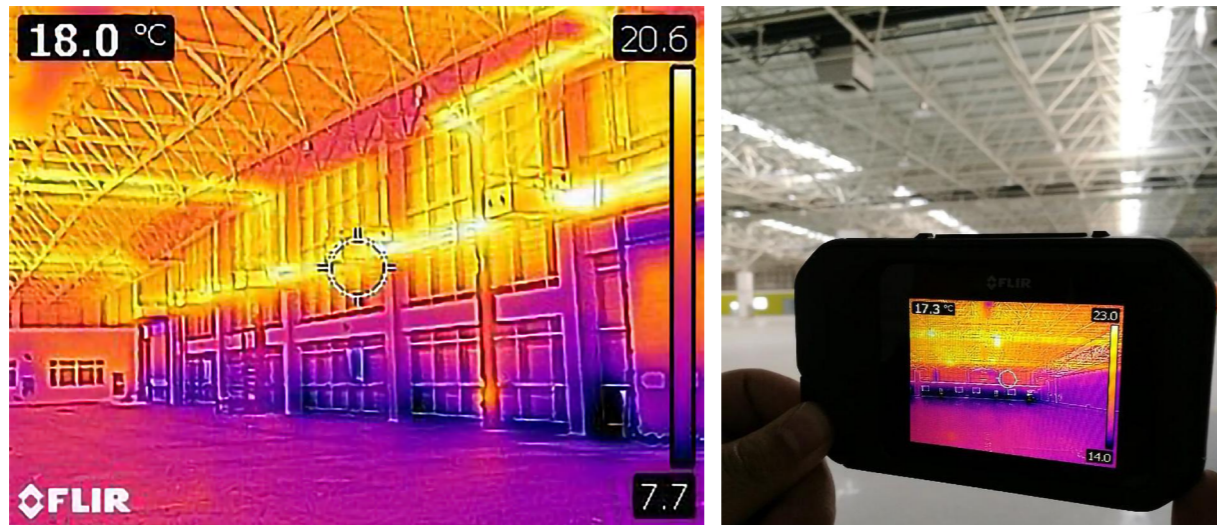
1. It is difficult for the thermal efficiency of gas-fired radiant heat utilization to exceed 55%. In gas direct-fired units, after gas combustion, it passes through coils where forced convection and heat transfer occur, resulting in higher thermal conversion efficiency (measured above 96%).
2. The gas-fired direct heating unit series products deliver heat directly and possess the capability to recover heat from the top of the space, thereby reducing temperature gradients within the space.
3. The heating coverage area of 1 gas-fired direct heating unit is equivalent to the combined coverage area of 2 gas-fired radiant heating units, while the gas consumption is only equal to that of 1 gas-fired radiant heating unit. The total gas consumption for the same project is nearly halved.
4. To meet the heating requirements of the same project, the number of direct-fired heating units installed in our company is only half that of gas-fired radiant heating unit. The installation is simpler, which can reduce the difficulty of construction greatly.
5. Infinite regulation of heating capacity (automatically adjust gas flow according to temperatur requirements), and accurate temperature control.
6. According to the precise matching of gas flow rate with air volume (0.1%), ensure sufficient combustion and environmentally friendly emissions.

Heating energy consumption	69%	Smoke energy loss	5%
Antifreeze energy consumption	10%	Water pump energy consumption	8%
Energy consumption of board replacement	3%	Pipe network energy consumption	5%

Energy-saving operation

High: Continuously recover heat from the top space to send the heat to the working area at the bottom

Many kinds of heating equipment are used in tall buildings. AirTS series of equipment can be installed on the roof, with the only top heat recovery function. The swirling air supply covers a large area while the top heat is recovered and sent down to the working area of ground, which generates continuous resistance to hot air drift, reducing adverse temperature gradient in space height, and greatly saving operation cost. However, the heat generated by traditional heating equipment (heating radiator, side-blown fan heater, gas-fired radiant heating equipment) drifts to the top space and cannot be adopted, and the drifting heat has no significance to the temperature increase of the bottom working area.



Measurement for the temperature difference between the top and bottom of large space

Example and calculated reference of top heat recovery in the heating condition

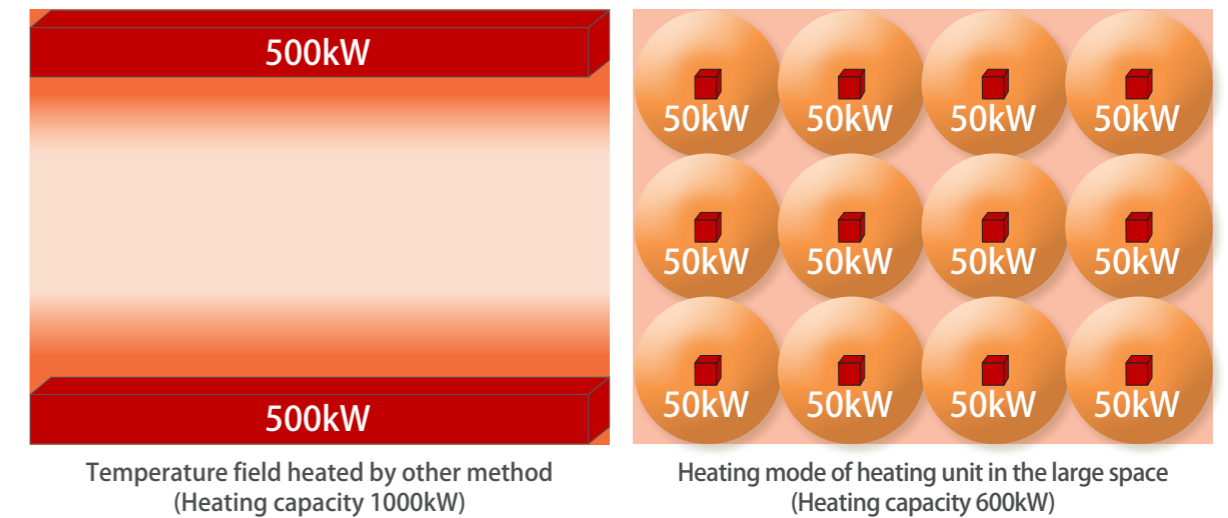
Time frame		Temperature at the top of plant Temperature of working area on the ground	Each device (9700m ³ /h) Top heat recovery $Q = cm \Delta t$
Roof without sunlight hours	(16:00-08:00)	Temperature difference $\geq 3^{\circ}\text{C}$	$Q \geq 10\text{kW} \cdot \text{h}$
General sunlight hours of roof	(08:00-11:00) (14:00-16:00)	Temperature difference $\geq 6^{\circ}\text{C}$	$Q \geq 19\text{kW} \cdot \text{h}$
Strong sunlight hours of roof	(11:00-14:00)	Temperature difference $\geq 10^{\circ}\text{C}$	$Q \geq 33\text{kW} \cdot \text{h}$

Notes: For the workshop height 12m, the temperature of working area is required as follows: 10°C in the working time, 3°C -5°C in the non-working time.

Large: The devices in the space are arranged uniformly, and heat is distributed evenly

As the building area increases, the traditional heating equipment (heating radiator, side-blown fan heater) arranged in the building is difficult to increase the temperature in the middle area of the space. AirTS series equipment is installed on the roof and can be evenly arranged in the space, and the heat can be evenly distributed in the whole space.

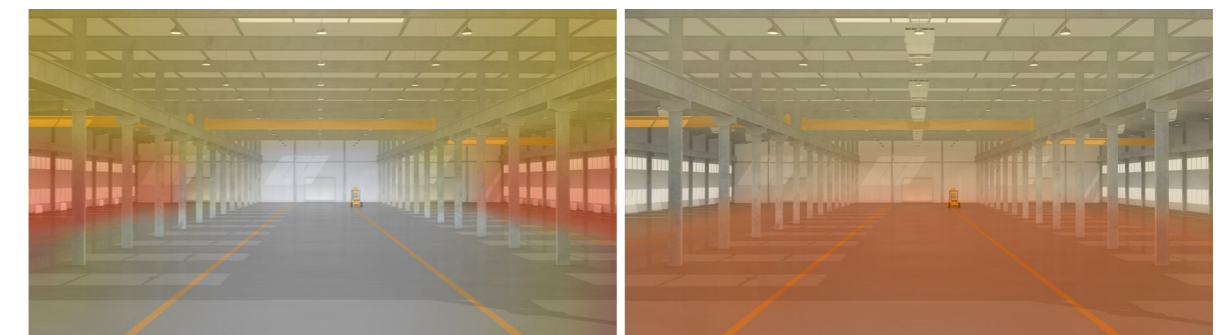
According to the following two heating methods as shown below, the more evenly distributed the temperature is, the less total heat is required. In view of the radiator and floor heating methods widely used in the civil field: When floor heating requires low water supply temperature and energy saving, average temperature and comfort are also greatly improved.



Space: Decrease the temperature of roof and surrounding walls, decrease the temperature difference with the outside world, and reduce heat loss through the top and around

Conventional heating devices (radiator, side-blown fan heater) are installed around. The high temperature area in the whole space is near the surrounding walls, which is the main heat loss area. The higher the temperature is, the easier it is to exchange heat with the outside world. In addition to thermal drift, the resulting heat gathers in the top space, and roof temperature increases. Heat exchange is generated through the roof and the outside world, resulting in constant loss of heat.

For AirTS equipment in a tall space, the surrounding area is the area with the lowest temperature in the whole space as can be seen from the whole temperature field, and the temperature difference with the outside world is small, reducing heat loss with the surrounding walls. The equipment has the function of top heat recovery, reducing the heat accumulation of the top, decreasing the temperature of the roof, reducing the heat exchange with the outside world, and minimizing the external heat loss of the whole space.



Temperature field heated by other method—schematic diagram of temperature field
Heating mode of heating unit in the large space—schematic diagram of temperature field