Heat Pump Dryer

Widely used in agricultural and industrial area





Marine Products

Tobacco

Grains

Timber Industry







Introduce

Nowadays the market for heat pump systems for water heating and space cooling/heating is well developed in the European countries.

However, Products of heat pump dryer have become known in many developed and other developing countries ,they are interested in applications of heat pumps for energy saving and pioneers have invested much money and time on heat pump dryer research, especially for industrial and agricultural drying purpose. The market has increased in the past few years.

Heat pump drying is a technology by which materials can be dried at low or high (10-80 ℃) temperature. They provide a means to dry products in a controlled or modified atmosphere, which may be oxygen-free, using less energy than common drying methods.

Heat pump dryer is therefore advantageous for drying biological materials which are thermally sensitive and oxygen sensitive.

Components



Characteristic

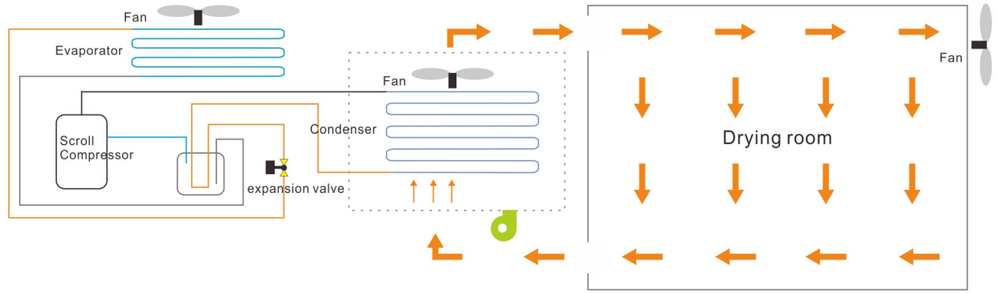
- High energy efficiency (reduced energy consumption) – up to 60% reduction in energy costs compared with traditional drying technologies.
- More environmentally friendly – 80–100% reduction in emissions of chemicals released as a result of drying some products and up to 60% reduction in CO2 emissions.
- Consistent output of products – heat pumps can operate 24 hours per day, so the production potential is higher than for traditional drying.
- Better product quality – heat pump dryers condition such as temperature and air flow rates are controlled to meet specific requirements. sensors and advanced controllers are used to adjust the temperatures of the condenser and evaporator to obtain suitable drying temperatures, which is not possible with traditional drying methods. It is also possible to control the speed of the fans to achieve optimal air flow.



Comparison of Heat Pump Dryer with common traditional drying methods

Item	Heat pump dryers	Electrical heating	Diesel engine heating	Wood burning	Sunlight
Efficiency	High	Low	Low	Low	Very low
Temperature range	10-80 (℃)	0-100(℃)	0-100 (℃)	0-100 (℃)	⩽40 (℃)
Operation time	Anytime	Anytime	Anytime	Anytime	During the day
Drying air flow	Controlled by fan speed	Controlled by fan speed	N/A	N/A	Depends on wind
Moisture extraction	Accurate	Accurate	Low	Low	Depends on weather
Temperature control	Accurate	Accurate	OK	Fair	N/A
Product quality	Perfect	Good	Effected by smoke	Effected by smoke	Depends on weather
Environmentally friendly	Yes	Yes	Release CO_2	Release CO_2	Yes
Weather effect	No	No	No	No	Yes
Initial capital cost	Very high	High	High	Fair	Low
Payback period	Short	Long	Long	N/A	N/A
Maintenance costs	Fair	High	High	Low	Very low
Application range	Wide	Wide	Limited	Limited	Limited

Schematic diagram





Product Parameter

Model		ARG-03D	ARG-05D	ARG-10D	ARG-15D
Heating Capacity	KW	8	14	28	42
	Btu/h	27300	47700	95500	143000
Compressor	Type	Scroll			
	Brand	Copeland			
	Refrigerant	R134A			
Max. Hot Air Temp.	℃	80			
Max.Pressure (High Pressure Side)	MPA	3.0			
Max. Circular Air Flow	m³/h	4500	7500	15000	22500
Max. Hot Air Flow	m³/h	780	1300	2500	3900
Temperature Control Accuracy	℃	±1			
Moisture elimination volume	kg/h	15	25	49	76
Power Supply	V/Ph/Hz	220~240V/1PH/50Hz	380V/3PH/50Hz		
Rated Input	KW	3.06	5.1	10.2	15.3
Rated Current	A	13	8	16	24
Sound Level	dB(a)	58	62	62	62
Outer Case Material	Material	Galvanized Steel or Stainless Steel			
Product Dimention (L x W x H)	mm	1375x1040x1470	1575x1080x1530	2180x1100x1645	2215x1305x1765
Net Weight	kg	200	280	470	600

Applications







Location	Application(s)	Conclusion
SiChuan Province	Red chillies	The high quality of the dried chillies was highlighted as the major advantage of heat pump dryer compared to sun drying







Location	Application(s)	Conclusion
Fujian Province	Marine products	Computer simulation model of the heat pump dehumidified drying was shown to be in good agreement with experimental results .The modified atmosphere heat pump dryer produced better physical properties





Location	Application(s)	Conclusion
GuangXi Province	Timber	Better product quality . The specific moisture extraction rate of the designed dryer was notably more than conventional types of dryers with respect to saving energy