WOODTECH

KILN

VOL - 3 | 2023

The leader in Automatic Timber Seasoning Kilns... 550 Kilns Installed & Running Successfully.

INTRODUCTION

Started in 2001, WOODTECH has more than 20 years experience in building of timber drying plants and in wood moisture measurements. We have built more than 550 kilns all over INDIA and Neighbouring Countries

OUR PRODUCTS

Woodtech kiln drying equipment, through constant product development and product improvement over the last 20 years, have reached the highest level of Quality and Reliability. Our dryers are efficient, are designed to withstand corrosion, and use the most advance microprocessor based controllers to control the entire drying process.

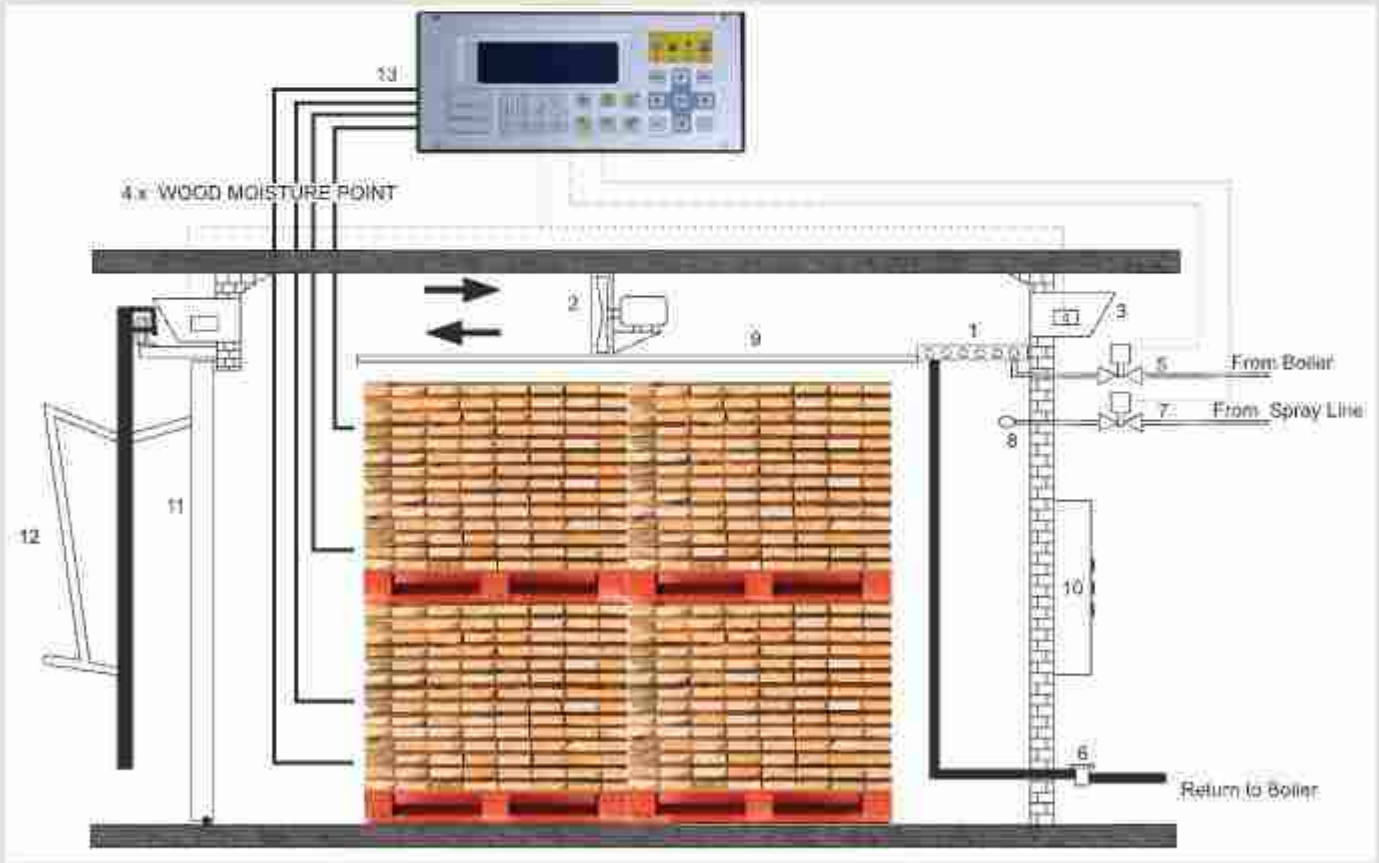
Kiln Capacity And Dimensions

Woodtech kiln dryers are available in capacities from 500 cft to 3000 cft with the following dimensions. The heat requirement for each capacity is also shown.

CAPACITY	TYPE OF LOADING	CHAMBER INTERNAL DIMENSION (m)	INSTALLED POWER (Kw)	HEAT REQUIRED PER KILN
500 cft	Forklift	4.2 W x 5.0 D x 4.5 H	6.0	40,000KCal/hr
750 cft	Forklift	4.2 W x 6.2 D x 4.5 H	6.0	60,000KCal/hr
1000 cft	Forklift	5.5 W x 6.2 D x 4.5 H	9.0	80,000KCal/hr
1500 cft	Forklift	5.5 W x 7.2 D x 5.2 H	9.0	1,20,000KCal/hr
2000 cft	Forklift	7.2 W x 7.2 D x 5.2 H	12.0	1,60,000KCal/hr
3000 cft	Forklift	9.5 W x 7.2 D x 52 H	15.0	2,40,000KCal/hr

Section Side View of a Conventional Kiln

The picture below shows a cross sectional side view of a conventional steam heated kiln dryer. The major components that make up a complete kiln dryer are listed below:



1. Heat exchanger (Finned tubes)
2. Air-circulation fan
3. Vents / damper
4. Damper actuators
5. Motorized heating valve
6. Steam trap
7. Spray valve
8. Spray line
9. Sub-ceiling
10. Fan control panel
11. Main door
12. Door trolley
13. Kiln controller

Functional of each Kiln Component

Heat exchanger

The heating medium can be steam, hot water or thermic fluid, depending on the type of boiler or heater used. The heat exchanger consist of many finned tubes (to increase the heat exchange surface) welded together. It's function is to transfer the heat from the heating medium to the passing air. Finned tubes have extruded aluminum fins which is the most efficient for heat transfer. The heat exchanger is subjected to rapid corrosion.

Air circulation fans

Airflow is one of the most important factor in the drying of timber. The ideal air velocity across the timber stack is 2m/s. For some wood with pressure impregnated chemical treatment where the initial moisture can be as high as 150% the airflow has got to be even higher, up to 4m/s. The high airflow will help to quickly evaporate the large amount of free water, thus reducing the drying time. The fans have reversible flow and are rotated in the opposite direction at every 4 hours interval. This is to ensure that the timber is dried evenly at both ends of the kiln. The Fans are aluminium material & the size of the fan diameter is 800 mm.

Motor

The kiln motor driving the fan is normally 3 kilowatt and has to be with Class H windings. The kiln chamber can be very humid and moisture ingress into the motor can damaged it. Therefore, the motor enclosure has to be at least IP55.

Damper

Some call it vent. When the air in the room becomes too humid or wet after absorbing the wood moisture, an air change is required. The kiln controller will signal the actuators to open. Depending on the direction of the airflow, the dampers or vents on the high pressure side of the fan will act as intake to bring in fresh dry air. When the controller senses that the air humidity has reached the desired level, it will signal the damper actuator to close.

Damper Actuator

As describe above, the actuator is to operate the dampers. A common shaft linking a row of dampers will transmit the turning motion of the actuator to each damper. Since there are two rows of dampers, two Damper actuators are required for each kiln. The damper actuators are designed to rotate 90 Degrees to open or close the vents. The linkage connecting the vents together has to be checked periodically to ensure that they are fastened tightly to the shaft so that no slippage occurs.

Motorized Heating Valve

When the kiln controller senses that the kiln temperature is below the set temperature, a signal will be sent to open the heating valve allowing the heating medium to enter the heat exchanger to heat up the room. The valve will get closed when the controller senses the set temperature is reached. For steam heating, a motorized 2-way globe valve or ball valve is used. For heating by hot water or by thermic fluid, a 3-way diverting valve is used. The heated oil or water will be directed to flow into the heat exchanger when heat is required. When the temperature has reached the set temperature the fluid is directed to the heater.

Steam Trap

For a steam heated kiln, when the steam loses heat in the heat exchanger, it turns into water. To remove the water only without taking losing the steam, a steam trap is required. Most kiln manufacturers use the low cost thermodynamic type, which is not very efficient in removing water without releasing steam. More heat is lost using this type of trap. We uses only the Bucket type steam trap which has a high water removal capacity and releases only water and not steam along with it.

Spray Valve

The spray vale is activated by the kiln controller when it reads a low humidity condition in the kiln room. In the case of a steam heated kiln, steam is sprayed to humidify the room. If thermic fluid or hot water is used as the heating medium, then water spray is used. The water, however, has to be atomized into a fine mist in order to be absorbed by the air. The spray valves and spray nozzles are very dirt sensitive, it is imperative to place a 100 mesh strainer before the spray valve.

Spray Line

This is the pipeline inside the kiln connected to the spray valve. For stream spray, small holes of 3mm diameter are made at 1.5 M interval to release the steam into the kiln room. For water spray, atomizing nozzles are attached to the spray line. It is advisable that stainless steel pipe be used, as corrosion can cause the holes or nozzles be clogged up. These nozzles have to be cleaned and washed regularly.

Sub-Ceiling

This is a divider between the fans and the wood stacks so that, the air flows from one end of the room to the other end without short-circuiting.

Fan Control Panel

This controls the sequential starting of the fan motors so that, there is no power surge. It is also for changing the fan rotation at a regular interval. Safety features must be built-in. When a motor overloads, when one power phase is down, or when there is a leakage, the panel will be automatically tripped. The panel must also indicate when any of the motor is tripped or not running.

Main Sliding Door

This is normally a lift and slide door made of aluminum extruded frame. Insulation is placed inside the panels to prevent heat lost from the kiln. The Main door extruded frame profile allows a rubber seal to be slide in place to provide good sealing when the door is closed.

Door Trolley

This is a shared device for opening the main door. It has a built-in or hydraulic lifter to lift the door. When the door is fully lifted, the trolley can slide along the door rail to open up the kiln dryer.

Kiln Controller

Kiln Controller

Genius 25 is one of the intelligent controller for Timber drying kilns and start-up dryers. This is the heart of the system. It is fully automatic and programmable. It is the first complete controller able to bring the reliability and the performances of high-end products to markets that usually adopt simple static controllers.

With **Genius 25** you can improve the quality of your product and cut down your kiln's energy costs, also in small plants.

Genius 25 is built on a powerful microprocessor system that provides flexibility on regulation, history, and superior reliability, all in an easy-to-use platform.

Genius 25 regulators give you...

Maximum flexibility: you can buy optional features only if you want and if you need them.

The easiest installation ever and the low maintenance needed simplify the operations, helping you in keeping down costs while keeping high reliability and profits.

The best-in-class product in its category.

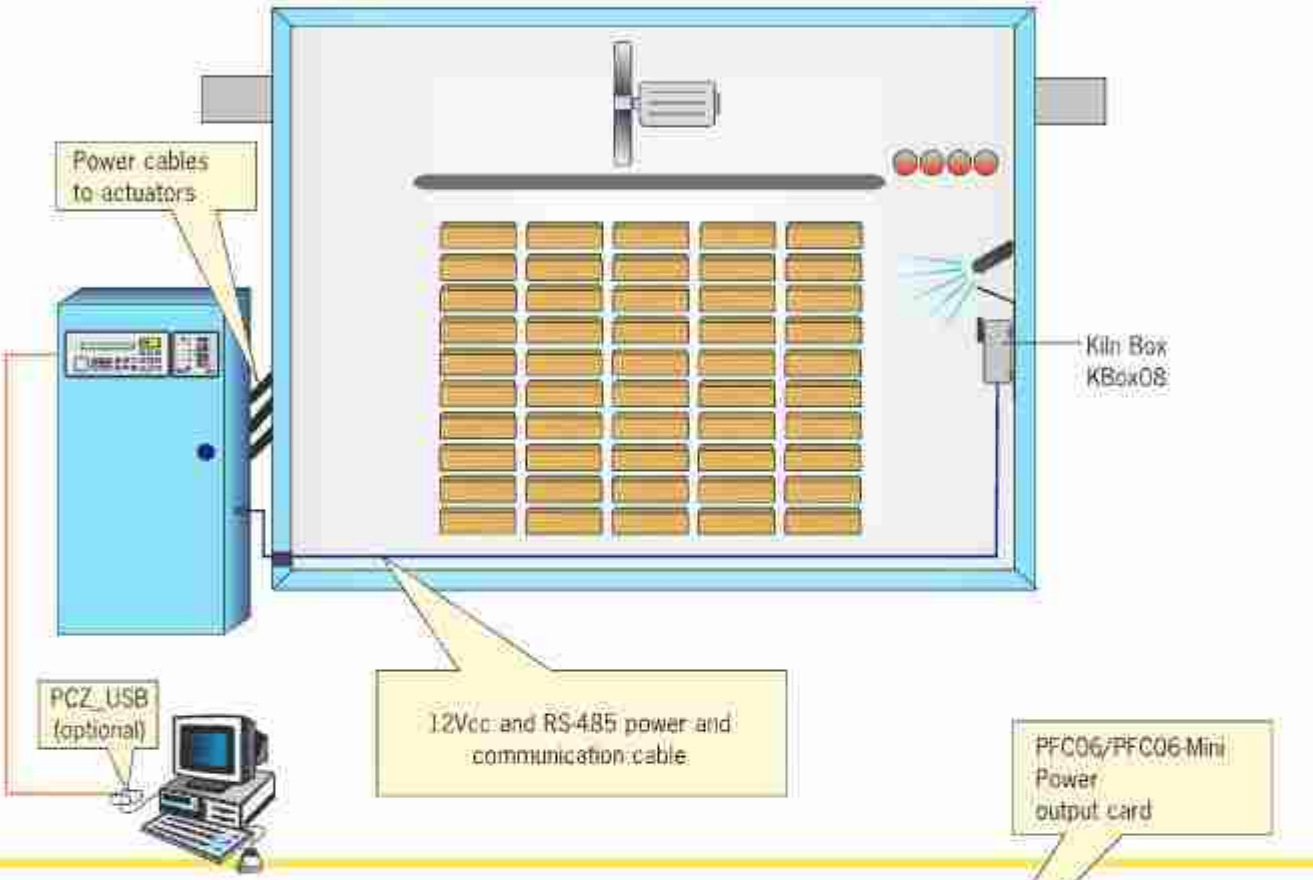
Genius 25 Controller Features

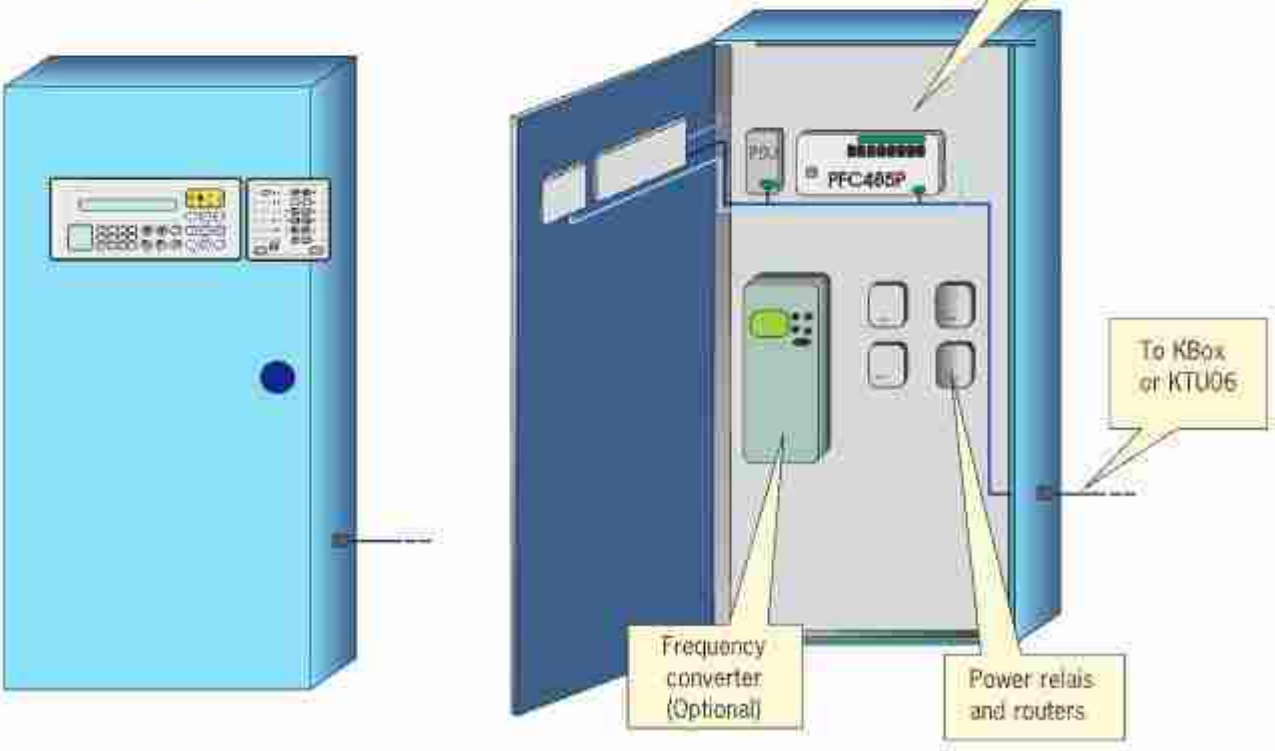
- Easy Interface with an intuitive navigation system.
- 8 phases for each drying schedule. You can choose phases from a set of five different phases type: heating, conditioning, saturating (conditioning-bis), drying, cooling.
- **Genius 25** controller allows you to work with a wood moisture-based drying
- Smooth control of EMC / Relative Humidity and temperature.
- Sensor devices allow you to measure:
  - Up to 4 core wood moisture
  - One climate measure (Temperature and EMC/RH)
- Regulate air humidity in EMC, Drying Gradient or Relative Humidity.
- Possibility to control (through MiniPFC):
  - Dampers, to cool and dehumidify. You can configure an open-close timed valve or an on/off system.
  - Heater. You can configure an open-close timed valve or an on/off system.
  - Fan speed (0-10V or 4-20mA output).
  - Fan activation and direction.
  - Water Sprayers (on/off or PWM contact).
- Possibility to install temperature sensor on the heat exchanger to monitor its inlet/outlet temperature and to automatically protect it from freezing.
- Display: 240x64 pixels graphic display.

Genius 25

Genius 25 controller installation

Example of a wood drying application





Genius 25 regulator allows you to work with an unbeatable series of products

PFC06-Mini - Power Output Device

PFC06-Mini is an output card featuring high reliability and RS485 communication. The board provides outputs for heater, dampers, fans, fans speed and sprayers. It is standard DIN OMEGA RAIL mountable.

KBox - Kiln Box for kiln measurements

KBox is an input device connected through four wires: RS485 data bus and power supply. It is the first high precision electronic device that can be installed directly inside the kiln, giving you shorter, easier and more reliable wiring.

Kbox provides one temperature, one EMC/RH and four moisture measures. Like other moisture measurement devices it is based on our technology, which guarantees high quality wood moisture measures and a wide measuring range (5%-200%). In addition to it, SS2 Adaptive Smart Sample gives this device an extraordinary noise immunity. Moreover, with KBox you get all the benefits of using PST032-S2 EMC/relative humidity sensors.

KBox can be programmed, monitored and calibrated through KBox-Spy software.

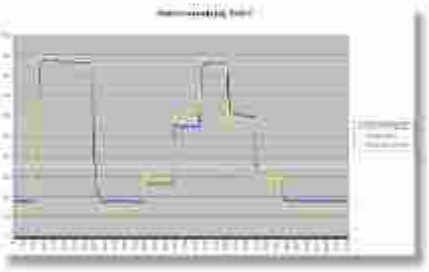
PST032-S2 - Relative Humidity and EMC sensor elements

PST032-S2 is the sensor element especially developed for wood drying applications.

Its features are:

- high speed response that allows to spray in kiln only the required amount of water, saving drying time and energy;
- higher precision compared to electronic sensors, which allows a better controlled drying process;
- high reliability thanks to high chemical and hydrolysis resistance.

Its performances make it the best choice for hard environments.

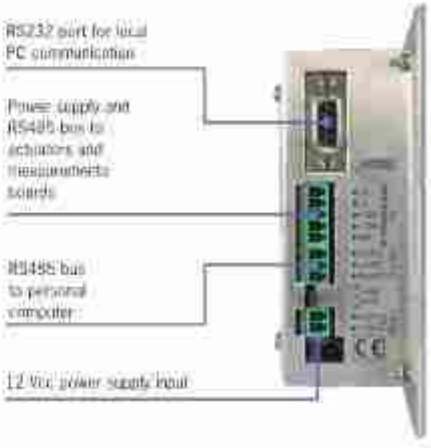


OPTIONAL FOR ISPM-15

ISPM-15 HT treatment can be flexibly configured to satisfy different countries' requirements. You can configure the minimum number of probes that you need and if an initial check of temperature probes is required, you can also configure the precision of working probes and, if needed, of the reference probe. The reference probe is digitally read through RS 485 bus. It is possible to configure up to 4 temperature probes.

System RX V6

System RX is an advanced control software featuring an easy-to-use interface, a professional historical data analysis tool, multiuser and network operation capabilities (telephone, LAN, internet), high speed operations through the new PCZ-USB (USB - RS485 interface), PDF report generation for drying and HT processes. With SystemRX you buy only the features that you need.



KTU06 - Kiln Temperature Unit

KTU06 is an input device that can be connected through RS485 bus. It provides four temperature channels for PT100 sensors.

KTU06 can be monitored and calibrated through KMU-Spy software.

WoodMultiMeter and EasyMeter - Portable meters

WoodMultiMeter is an advanced wood moisture and climate meter.

Based on Cet technology, it allows the following high quality measures:

- Full range wood moisture with linear wood group compensation;
- Climate (EMC, Temperature, Relative Humidity) through the electronic probe Digiprobe;

Other features:

- Selection of Celsius or Fahrenheit temperature scale;
- External temperature calibration capability;
- Powered by two low cost alkaline AA batteries;
- Battery voltage reading;
- Internal temperature sensor.

SOME OF OUR KILN PROJECTS

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WOODTECH

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