Product
Application
Guide

Timber Kiln Control Using the COMMANDER 1960

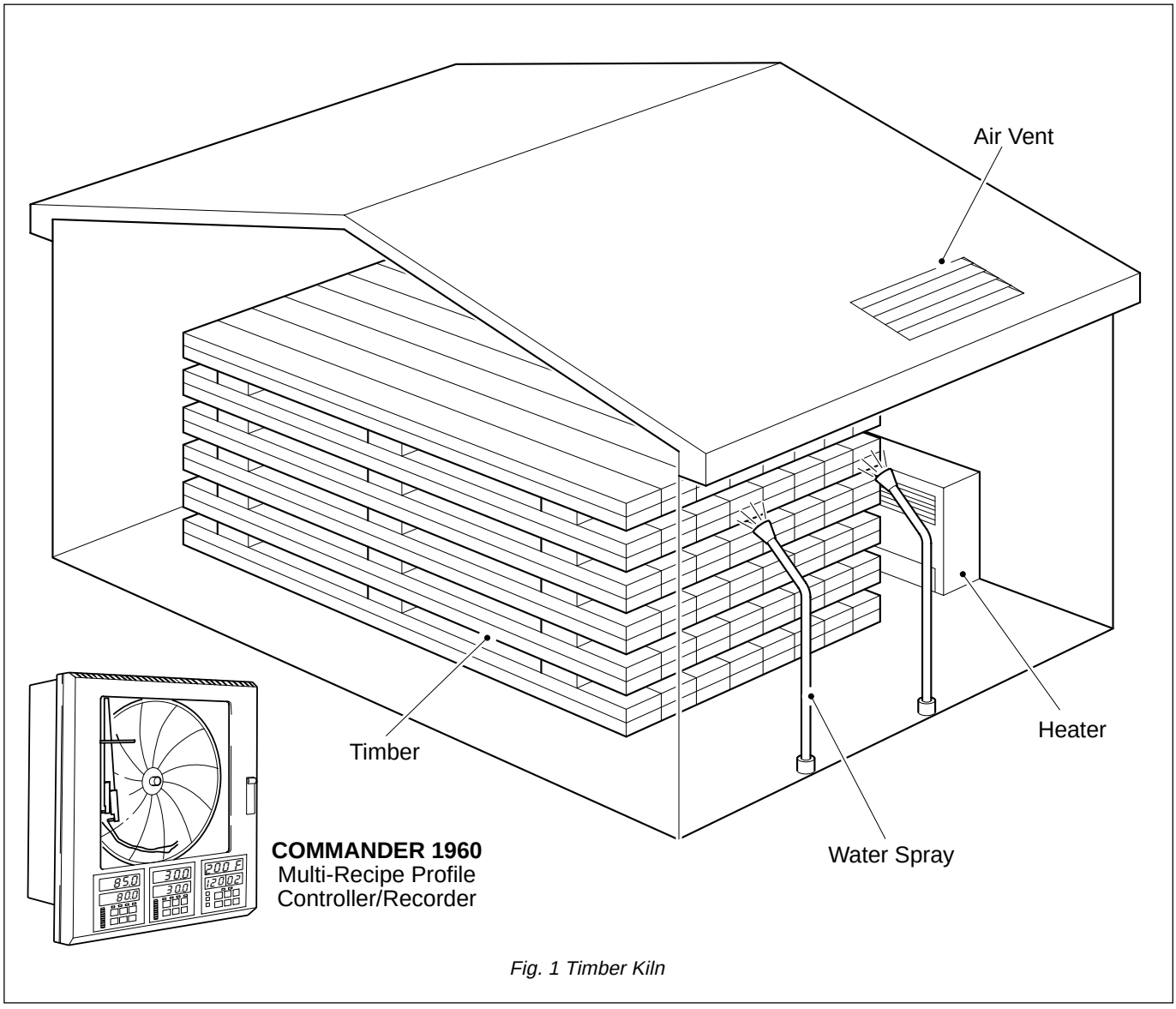

Fig. 1 Timber Kiln

ABB Instrumentation

Why Use a COMMANDER 1960?

- Automatic temperature control for increased production and operational efficiency.
- Up to 10 set point profiles per controller, including guaranteed Ramp/Soak with individual hysteresis for precise temperature profiles and improved product quality.
- Dedicated front panel for Ramp/Soak profile applications.
- Segment time remaining indication.
- Fast start-up with self-seeking set point.
- Direct-connected RTD and/or thermocouple inputs reduce installation costs.
- Easy-clean NEMA4X/IP66 front face.

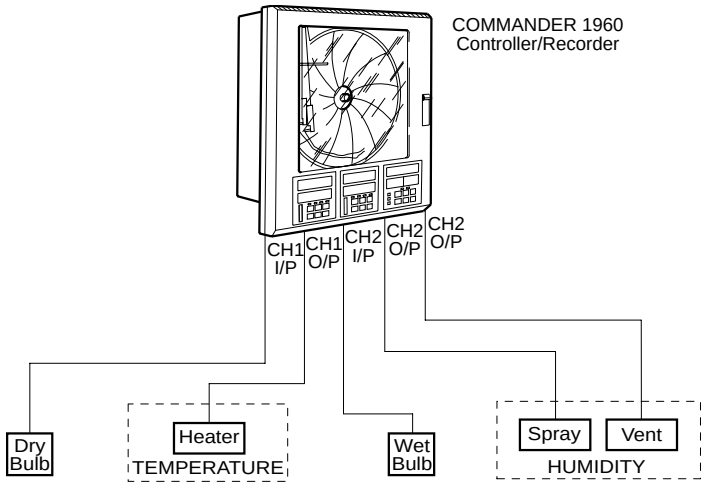

Fig. 2 COMMANDER 1960 Input/Output

The Application

Most timber is used in relatively dry situations and must be dried before use otherwise it will shrink and distort after installation as it loses water to the surrounding air.

The amount of water in wood rises and falls in response to changes in both temperature and humidity so it is not possible to prevent wood from expanding and contracting once installed. However, this can be minimized by drying the wood so that it will be approximately in equilibrium with the expected conditions of service.

Drying is important for other reasons. At moisture contents below the fibre saturation point, the strength properties of timber improve. Below about 20% moisture content, timber is no longer susceptible to fungal attack.

A timber kiln may be defined as 'a closed structure designed or adapted for the purpose of reducing the moisture content of timber and wood based panel products.'

Excessive humidity retards drying and decreases kiln output; low humidity causes the timber to dry too quickly and encourages degradation.

High temperatures cause degradation; low temperatures decrease kiln output.

With instruments controlling these variables, it is possible to maintain a constant temperature continuously and maintain a constant humidity for a part or all of the drying schedule.

Control System Objectives

Most timber kilns require control of both the temperature and the humidity.

Temperature Control

Temperature may be controlled by switching a heater on and off, or by modulating the steam flow through a heat exchanger system.

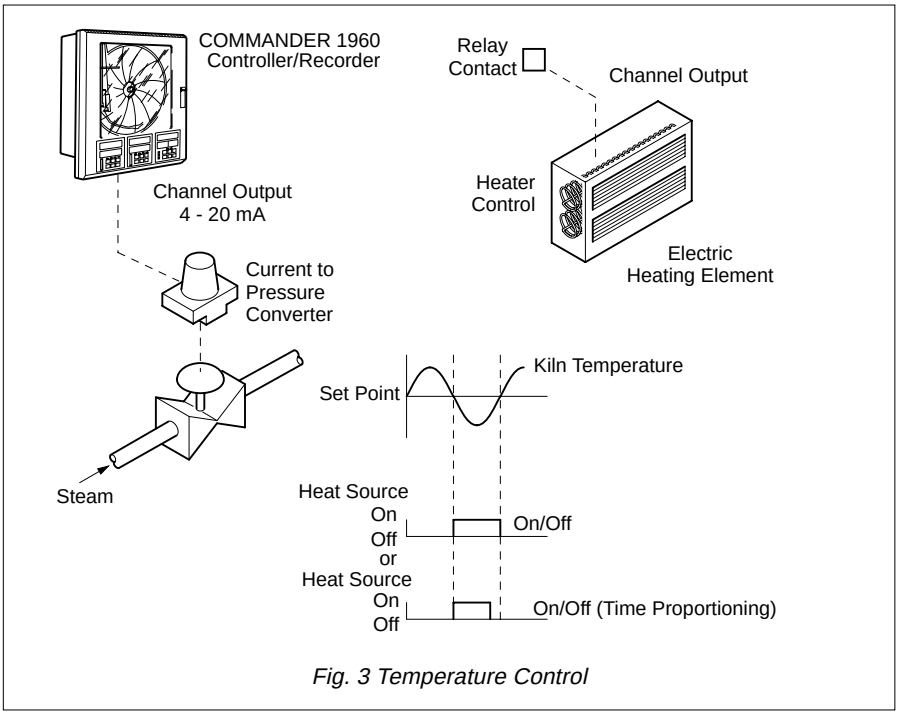

Fig. 3 Temperature Control

Humidity Control

Humidity within the kiln may be controlled by switching a sprayer system on and off and by opening and closing a vent.

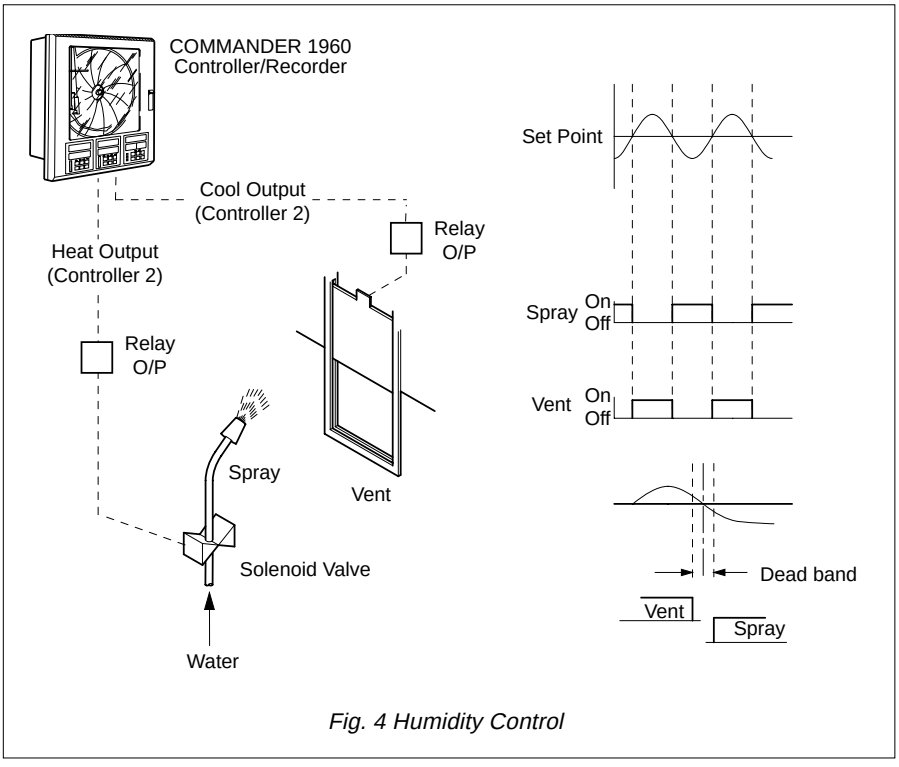

Fig. 4 Humidity Control

Features and Benefits

Precise Set Point Profiles Improve Quality, Consistency and Yield

- The COMMANDER 1960 features a Ramp/Soak set point profile generator with configurable hysteresis. It provides up to 10 temperature profiles and a maximum of 99 segments to be distributed throughout the programs.
- Configurable hysteresis gives the flexibility to set the upper and lower limits of both ramp and soak segments to achieve a particular process requirement.
- Guaranteed process ramp is provided as part of the COMMANDER 1960 profile and is useful in situations where steam fluctuations or loss of elecrical power may occur. During the ramping segment of a profile, the guaranteed process ramp feature tries to ensure that the process temperature keeps pace with the rising set point. If it cannot (e.g. process steam supply is interrupted), the feature will delay set point ramp until process temperature is within the specified hysteresis band. This prevents sudden changes of temperature that could dry the timber too quickly.
- The guaranteed soak ensures that the temperature and duration of the soak are held to the configured set points.

Comprehensive Displays for Improved Operation

- The large, dedicated ramp/soak front panel display of the COMMANDER 1960 allow the operator to see displayed information from a distance. This information includes the target set point, time remaining in main soak segment (type 'K' software) and the segment running.
- The controller also includes status indicators to show if the profile is in a ramp or soak segment. Dedicated keys allow simple control of the profile. The keys are:
  - Run
  - Hold
  - Stop
  - Increase Time/Temperature
  - Decrease Time/Temperature

For more information on the C1960, please refer to specification sheet SS/C1960.

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