

Fig. 1 Horizontal Autoclave

## Why use a C360?

- ▶ Automatic temperature control for increased production and operational efficiency.
- ▶ Up to twenty set point profiles, including guaranteed ramp and soak with individual hysteresis for precise temperature profiles and improved product quality.
- ▶ Dedicated front panel for Ramp/Soak profile applications.
- ▶ Fully programmable using PC Configuration software.
- ▶ Status indicators, deviation bargraph and three displays showing process variable, set-point and output/segment time remaining/program and segment running.
- ▶ Fast start-up with self-seeking set point.
- ▶ Direct-connected RTD and/or thermocouple inputs reduce installation costs.
- ▶ Easy-clean NEMA4X/IP66 front face.
- ▶ Lockout facility for front panel profile control keys.

## Features & Benefits

### Comprehensive Ramp/Soak Display

Large, easy-to-read displays allow the operator to see displayed information from a distance. This information includes process variable (e.g. temperature and pressure) in the upper display (red LEDs) and set point in engineering units in the middle display (green LEDs). The lower display is multi-functional (orange LEDs) and displays the controller output in %, program and segment running, and segment time remaining. Secret-til-lit indicators show which mode the display is in.

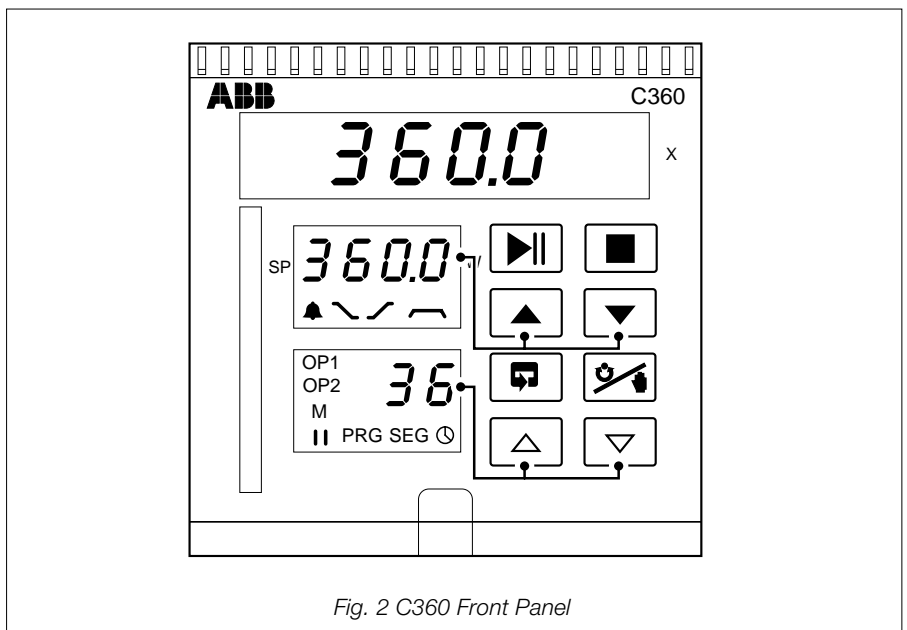


Fig. 2 C360 Front Panel

### PC Configurable

The PC Configuration Editor software (C100/0700) allows very quick and easy set-up of the C360. Complete configurations can be stored on floppy disk. This allows an unlimited number of different treatment cycles to be stored and downloaded when needed.

Reports can be printed of the controller's configuration for historical records.

## Autoclave Applications

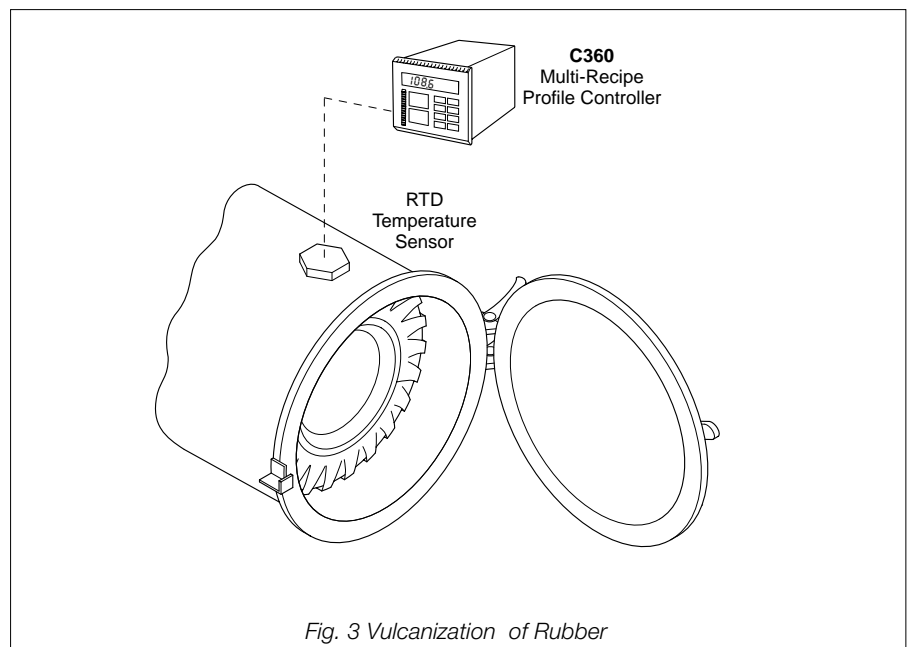
Autoclaves are used to perform various heat treatments in many different applications in the food, rubber, wood treatment, glass & glass fiber, plastics, hospital waste, pharmaceutical & chemical industries.

▶ **Food Production**

Food containers must be sterilized before they can be filled with product. This process is carried out by placing the containers into an autoclave and raising the internal temperature to a value high enough to kill unwanted thermophiles (botulism, salmonella, etc.).

▶ **Manufacture of Tires, Rubber Extrusions etc.**

In their raw state, elastomers are soft and sticky when hot; hard and brittle when cold. Vulcanization (Fig.3) extends the temperature range within which they are flexible and elastic. If properly carried out, vulcanization also improves mechanical properties, renders the rubber less susceptible to temperature changes and makes it insoluble in all known solvents.



▶ **Treatment of Hospital Waste**

To prevent disposal of harmful bacteria into the environment, hospital waste is sterilized. This is usually carried out in vertical autoclaves where waste material is loaded through the top door. Once sterilized, the treated waste is dropped out of the bottom door.

## The Autoclave Process

Steam is used to heat the autoclave contents, either by direct entry into the autoclave (where it is in contact with the product) or indirectly using a heat exchanger.

The temperature is raised to a predetermined level and maintained at that level for a number of hours to heat-treat the rubber, glass, plastic etc.

The **C360** controls the autoclave temperature by means of a valve in the steam supply line. The temperature input is provided by a resistance thermometer and the controller provides a 4 to 20mA signal to the steam control valve.

The heat treatment process is similar in vertical and horizontal autoclaves:

- Load autoclave with product
- Close and lock door
- Raise to soak temperature (ramp)
- Treat product for a set time (soak)
- Relieve pressure
- Unload autoclave

### Raise to Soak Temperature

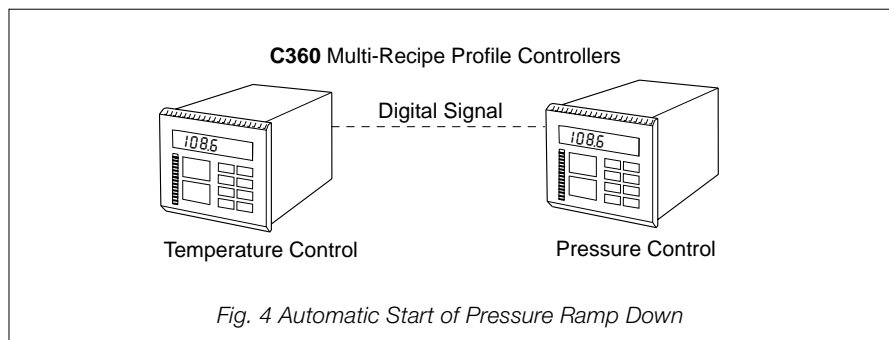
This period occurs after all interlocks are in place (doors closed and locked etc.). Digital inputs, used in conjunction with logic equations can be used to verify that interlocks are in place before the profile is started. The **C360**'s user-programmed set point profile takes the temperature from ambient to the desired soak value.

### The Soak Period

This period is essential in order to sterilize and treat the product correctly. Time schedules are determined by the product being treated and the end properties required.

### Pressure Relief Period

The autoclave pressure, attained as a result of heat treatment at high temperature in a closed vessel, must be relieved before the product can be removed safely. This can be achieved either by using a second **C360** to control pressure ramp down automatically (see Fig. 4) or by manually relieving the pressure using a bleed valve.



---

ABB has Sales & Customer Support  
expertise in over 100 countries worldwide

[www.abb.com](http://www.abb.com)

The Company's policy is one of continuous product  
improvement and the right is reserved to modify the  
information contained herein without notice.

Printed in UK (11.03)

© ABB 2003



**ABB Limited**

Howard Road, St Neots  
Cambridgeshire  
PE19 8EU  
UK  
Tel: +44 (0)1480 475321  
Fax: +44 (0)1480 217948

**ABB Inc.**

125 E. County Line Road  
Warminster  
PA 18974  
USA  
Tel: +1 215 674 6000  
Fax: +1 215 674 7183