

UNIVERSAL PROGRAMMABLE CONTROLLERS FOR HEAT TREATMENT



PROTHERM 500 / 600 / 700 PROGRAMMABLE CONTROLLERS

The PROTHERM 500, 600 & 700 are designed to monitor, control, record and archive heat treatment processes running in a furnace or simultaneously in multiple chambers. They are configurable for various types of batch and continuous furnaces.

MAIN FEATURES

- Visual display of the connected furnace, chambers, different configured components (e.g.: furnace door, recirculation turbines, etc.) and the loads
- Can hold up to 32 PID control-loops to regulate configured process parameters such as temperature, furnace pressure as well as atmosphere parameters (e.g.: carbon potential, nitriding potential and oxygen potential)
- Load oriented treatments: real-time monitoring of jobs at all stages of the process and all chambers of the furnace
- All process parameters can be configured with alarm limits
- Notification and processing of alarms
- An online diffusion calculation provides the capability to control the process using the required target values (e.g.: case depth, surface carbon content)
- Process variables can be viewed and recorded with chart recorders
- Log files in ASCII format can be downloaded to a remote computer for archiving
- Up to 99 treatments and templates can be created and modified



OPERATING CHARACTERISTICS

- Control knob or Touch-enabled screen enables user to select input fields and enter data
- Function keys are used for accessing the most important functions
- Users access to different functions is password protected
- A PC keyboard can be connected through a PS/2 port

BUILT-IN FUNCTIONS

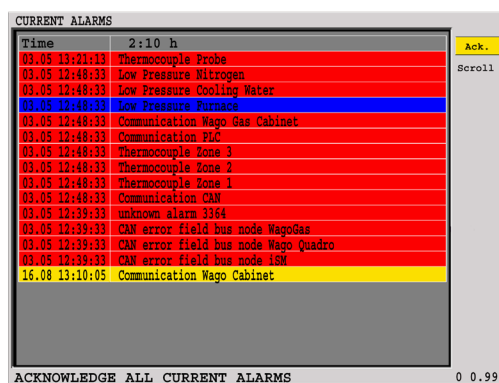
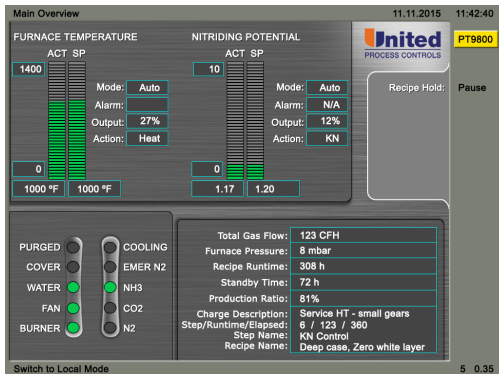
- Mathematical model for calculating atmospheric parameters from gas inputs and sensor values
- Real-time carbon and/or nitrogen diffusion calculation
- Hardness profile calculation based on chemical composition, carbon or nitrogen content in the material, and quenching parameters

CONFIGURATION

- The control loops, furnace graphics, process variables and more can be configured with a user-friendly proprietary configuration software
- The set-up of the PID parameters and other control functions are accessed via the configuration key



SCREENS



FURNACE & SETTINGS SCREEN

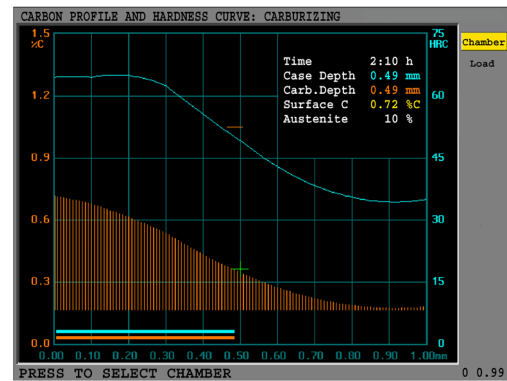
- Graphic display of the furnace chambers and loads
- Display of selected process variables
- Schematic view of the process gases system
- Input screen for process parameters

TREATMENT MANAGEMENT

- Treatments can be created and modified
- Jobs can be started and stopped
- Templates can be created and modified

HISTOGRAMS

- Paperless Flexible Chart Recorder
- 8 chart recorders (screens) displaying up to 8 process variables (64 analogue values)
- Zoom functions
- Slide ruler displays individual settings and values



SPECIAL PROCESS DIAGRAMS

- Diagrams that display the actual state of a load during a process
- Carbon content and hardness profiles
- Nitrogen content and hardness profiles
- Fe-C state diagram
- Fe-N Lehrer diagram
- Fe-N-C NICARM diagram
- Fe-O state diagram

CONFIGURATION

- Special menu for the configuration of the integrated controllers
- PID set-up
- Adjustment and setting of control parameters
- Real-time graph for displaying the control parameters and checking the settings

ALARM MENU

- Comprehensive alarm processing
- Recording of all alarms

INTEGRATION & HARDWARE

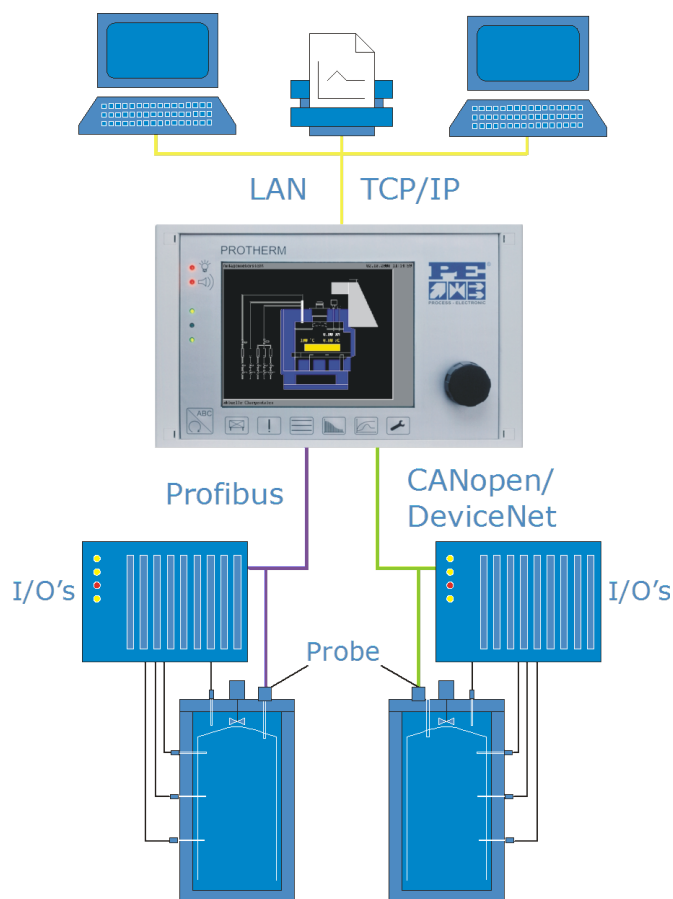
INTEGRATED WEB SERVER

- A remote computer can be connected to the device through a standard web browser
- Treatment logs in ASCII format are kept for 30 days and can be downloaded for further processing with any appropriate PC software (e.g. Microsoft® Excel)
- A powerful Java based configuration tool can be downloaded and installed on a local PC for configuring all device parameters

HARDWARE

- Protherm 500: Industrial PC with a 6" color TFT display, seven function keys, turn and press knob, serial port, keyboard port
- Protherm 600: Industrial PC with a 12" color TFT display, seven function keys, numerical keypad, turn and press knob, serial port, keyboard port
- Protherm 700: Industrial PC with a 15" color TFT display, touch screen, seven function keys, serial port, keyboard port
- Integrated industrial Ethernet interface for connecting to a PC via TCP/IP with the configuration software, host system connection is optional
- Integrated CANopen/DeviceNet interface
- Profibus interface available as an option

INTEGRATION / CONNECTION



ALSO AVAILABLE

Atmosphere Sensors	Oxygen, hydrogen and insitu carbon diffusion sensors used in various processes
Analyzers	Hydrogen, oxygen and ammonia analyzers available either as portable or fixed-mount
HT-Tools	Carburizing process simulation software with diffusion and hardness profiles
Protherm 10	Cost-effective temperature and industrial controller with expanded functionality, including a programmer and a datalogger
Protherm 20	Cost-effective measurement and control of carbon content, oxygen content, and dewpoint
Protherm 455	Multi-loop process controller. Direct drop-in replacement for Marathon's CarbPro, DualPro, MultiPro, and Carb PC
Protherm 470	Universal digital control system for regulating and controlling heat treatment processes
Protherm 9800	Integrated Production Management Software Package for optimizing the performance and efficiency of a heat treatment plant operating a variety of furnaces and for automatic handling of machinery