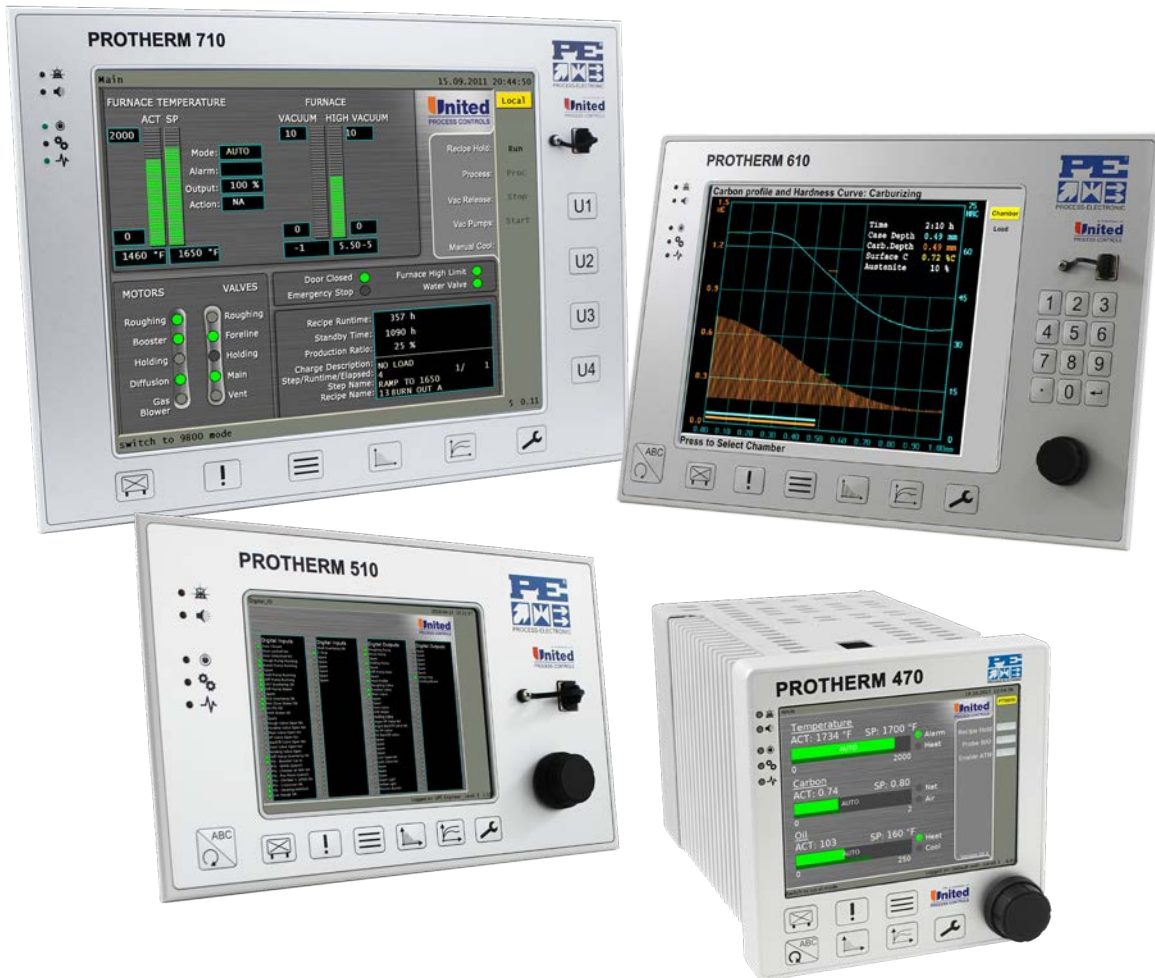


UNIVERSAL PROCESS CONTROLLERS FOR HEAT TREATMENT

PROTHERM SERIES

NO MORE GUESSING * PRECISE CONTROL GUARANTEED REPEATABILITY



Replacement for PROTHERM 100, 200, 300, 300DIFF, Nicarm 300, Carbocon OC2, OC3, OC5 and Carbonit

PROTHERM 470 / 510 / 610 / 710 PROCESS CONTROLLERS

FEATURES & CHARACTERISTICS

The **PROTHERM** series is 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. Installations are done on new or refurbished furnaces and are used for updating existing systems.

MAIN FEATURES

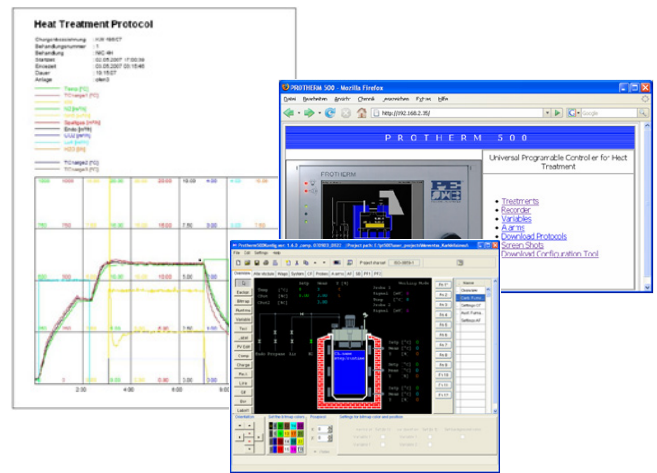
- Visual display of the connected furnace, chambers, different configured components (e.g.: furnace door, recirculation turbines, etc.) and the loads
- Can hold up to 32 PID control-loops to regulate configured process parameters such as temperature, furnace pressure as well as atmosphere parameters (e.g.: carbon potential, nitriding potential and oxygen potential)
- 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
- 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 PDF and ASCII-CSV format can be downloaded to a remote computer for archiving
- Up to 99 treatments and templates can be created and modified
- Seamless integration with the **PROTHERM 9800** SCADA system

OPERATING CHARACTERISTICS

- Control knob or Touch-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 USB port

INTEGRATED WEB SERVER

- A remote computer can be connected to the device through a standard web browser
- The treatment logs in PDF format and in ASCII-CSV format are kept for 30 days. They can be downloaded and then further processed 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 the device parameters

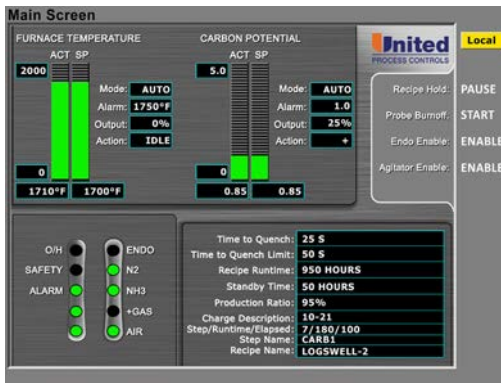


BUILT-IN FUNCTIONS

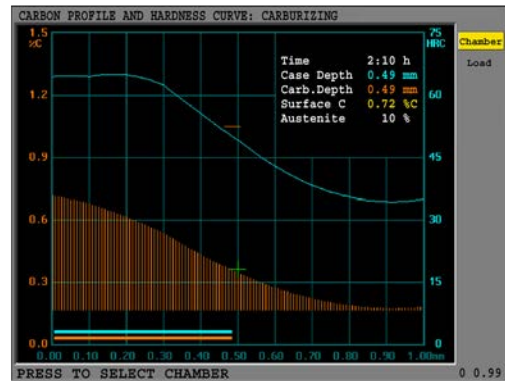
- Mathematical model for calculating atmospheric parameters from gas inputs and sensor values
- Real-time carbon and/or nitrogen diffusion calculation
- Hardness profile calculation based on chemical composition, carbon or nitrogen content in the material, and quenching parameters

CONFIGURATION

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



Main Screen



Carbon Profile

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

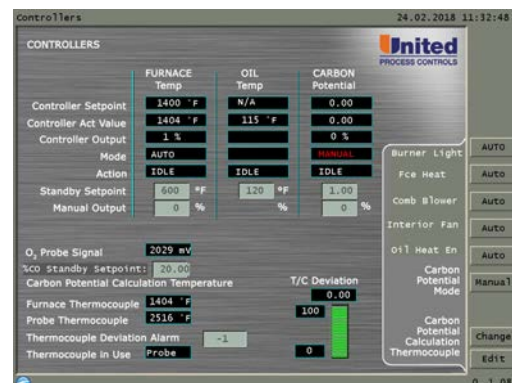
- Special menu for the configuration of the integrated controllers
- PID set-up
- Adjustment and setting of control parameters
- Real-time graph for displaying the control parameters and tuning the settings

ALARM MENU

- Comprehensive alarm processing
- Recording of all alarms



Thermocouple Calibration



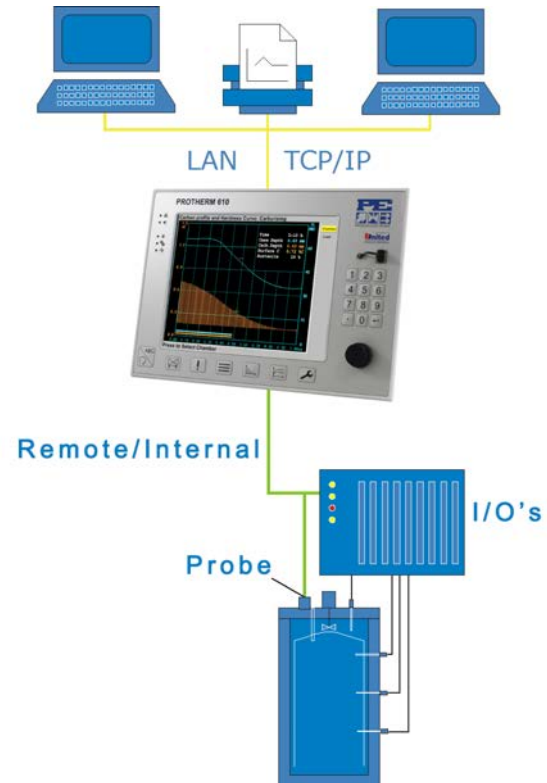
Controllers

HARDWARE

PROTHERM - Industrial Controllers

MODELS	PT 470	PT 510	PT 610	PT 710
Colour Display	5.5" (¼ DIN)	6"	12"	15"
Function Keys	7	7	7	10
Turn & Press Knob	✓	✓	✓	-
Numerical Keypad	-	-	✓	-
Touch Screen	-	-	-	✓
Serial Port	✓	✓	✓	✓
Keyboard Port	✓	✓	✓	✓
USB Port	2	3	3	3
Ethernet Port	✓	✓	✓	✓
2nd Ethernet Port	Optional			
CANopen	✓	✓	✓	✓
Modbus RTU	✓	✓	✓	✓
Modbus TCP	✓	✓	✓	✓
Internal I/O's	Optional			
Profibus	Optional			

INTEGRATION / CONNECTION



ALSO AVAILABLE

Analyzers	Hydrogen, oxygen and ammonia analyzers available either as portable or fixed-mount
Atmosphere Sensors	Oxygen, hydrogen and insitu carbon diffusion sensors used in various processes
Protherm 10	Cost-effective temperature and industrial controller with expanded functionality, including a programmer and a datalogger
AE25	1/4 DIN multi-loop universal process controller pre-configured for application
AE06L	1/16 DIN controller. Over temperature limit protection
Protherm 455	Multi-loop process controller. Direct drop-in replacement for Marathon's CarbPro, DualPro, MultiPro, and Carb PC
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
HT-TOOLS PRO	Simulation software for carburizing, carbonitriding, nitriding & nitrocarburizing processes
Flow Control	Complete line of custom flow measurement and control equipment designed specifically for industrial applications:
Control Solutions	Packages customized to significantly improve your heat treating operations, meet industry standards requirements and ultimately provide you with precise and reliable process control

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