

PROTHERM 470 / 510 / 610 / 710

UNIVERSAL PROCESS CONTROLLERS FOR HEAT TREATMENT

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.



PROTHERM™ 470



PROTHERM™ 510



PROTHERM™ 610



PROTHERM™ 710 TOUCH

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

PROTHERM SERIES

- NO MORE GUESSING
- PRECISE CONTROL
- GUARANTEED REPEATABILITY



Eco-friendly technology

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

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A NITREX COMPANY

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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

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

PROTHERM SERIES

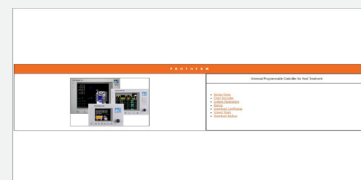
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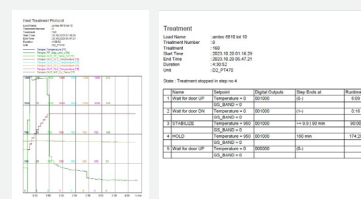
Eco-friendly technology

INTEGRATED WEB SERVER

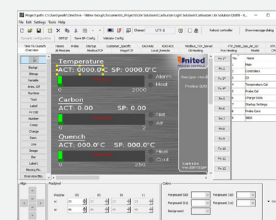
- A remote computer can be connected to the device through a standard web browser



- The treatment logs in PDF and 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



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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

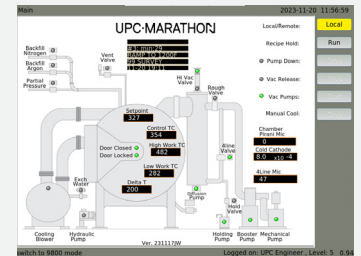
- Comprehensive alarm processing
- Recording of all alarms

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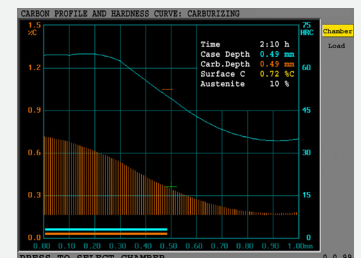
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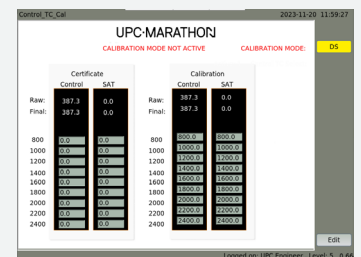
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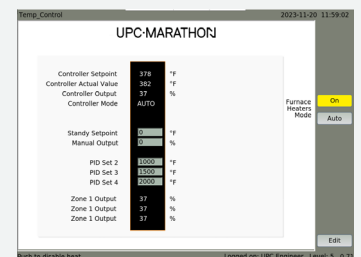
Main Screen



Carbon Profile



Thermocouple Calibration



Controllers

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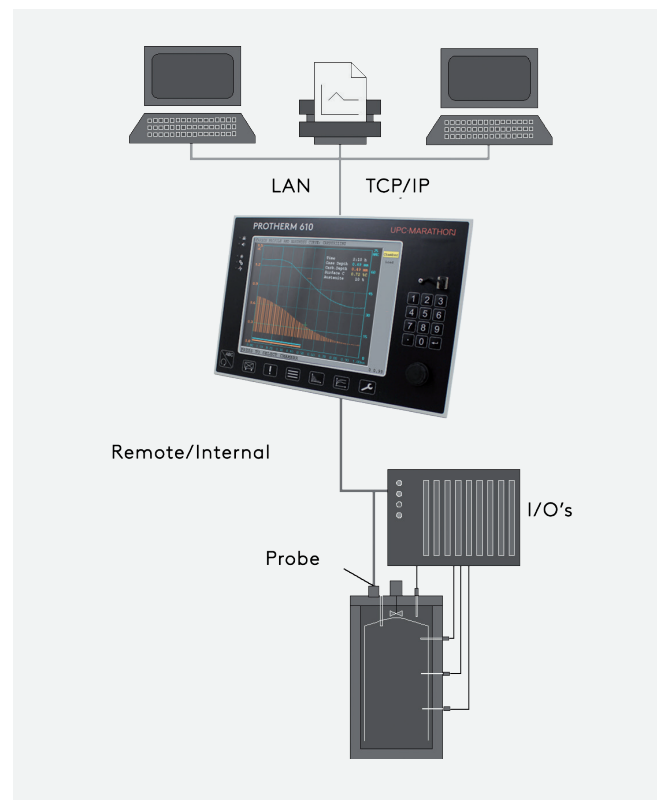
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HARDWARE

PROTHERM – Industrial Controllers				
MODELS	470	510	610	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	●	●	●	●
2 nd 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 IN-SITU SENSORS

Oxygen, hydrogen and in situ carbon diffusion sensors used in various processes

→ AE25

1/4 DIN multi-loop universal process controller pre-configured for application

→ AE06L

1/16 DIN controller. Over temperature limit protection

→ PROTHERM 455

Process controller with full touch screen functionality designed to monitor, control and record heat treatment processes

→ QMULUS

Revolutionary AI-powered and Machine-learning IoT platform that streamlines the work of heat-treaters, boosting efficiency, and enabling better decision-making.

→ QMULUS SIMULATOR

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 handling of machinery

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