

# NITREX

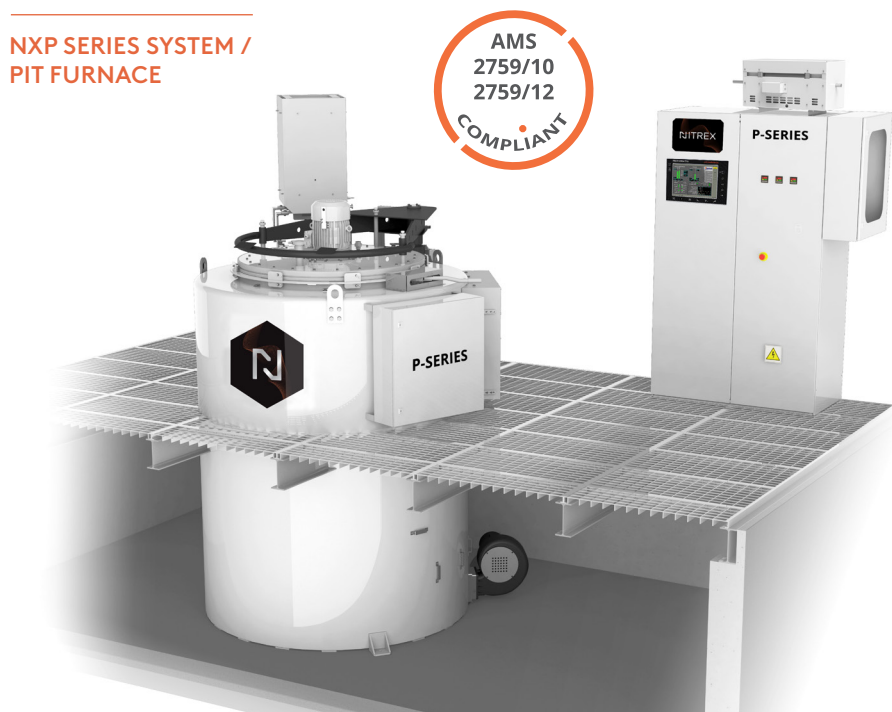
## P-SERIES NITRIDING / NITROCARBURIZING SYSTEMS

The P-SERIES is a new addition to the NITREX portfolio of nitriding/nitrocarburizing systems and is designed primarily for commercial heat treating companies.

It takes advantage of the best-of-class Nitrex nitriding/nitrocarburizing furnaces and features flexible controls based on United Process Controls' PROTHERM™ controllers, which are capable of running the most advanced user-configured recipes with % Diss,  $K_N$ ,  $K_C$  and  $K_O$  setpoints to meet AMS 2759/10 and 2759/12 specifications (depending on the options selected). PROTHERM™ controllers are feature-rich and offer easy connectivity to the PROTHERM™ 9800 Production Management Software or to third party SCADA systems. The integrated recipe builder allows the user to design a recipe by configuring process parameters such as % Diss,  $K_N$ ,  $K_C$ ,  $K_O$ , temperature, atmosphere mixtures, furnace pressure and more.

The P-Series opens up new vistas for expert users looking to leverage and support their in-house recipe development and process design capabilities.

### NXP SERIES SYSTEM / PIT FURNACE



## P-SERIES

NITRIDING/NITROCARBURIZING  
SYSTEM WITH UNITED PROCESS  
CONTROLS' PROTHERM™  
PROCESS CONTROLLER



### NXHP SERIES SYSTEM / HORIZONTAL BATCH FURNACE

#### P-SERIES AT A GLANCE

##### → FURNACE

Horizontal and vertical standard models with a load capacity of up to 1,500 kg (3,330 lbs) and 10,000 kg (22,000 lbs) respectively for a broad range of applications. Furnaces are designed to have fast heat-up and cooling rates, as well as uniform temperature and atmosphere throughout the work zone. By incorporating multiple controlled heating zones, temperature uniformity inside the retort is  $\pm 5^\circ\text{C}$  ( $9^\circ\text{F}$ ) or better.

##### → PROCESS CONTROLS

The PROTHERM™ controller monitors and regulates all furnace functions, nitriding/nitrocarburizing cycles with % Diss,  $K_N$ ,  $K_C$ ,  $K_O$  setpoints, alarms, and maintenance tasks. The integral H2Smart™ sampling system ensures extremely accurate measurement of hydrogen in the process atmosphere, thereby achieving precise control of processes.

##### → AUXILIARY EQUIPMENT

A range of optional auxiliary equipment is available to enhance the P-Series capabilities and process efficiencies Water System, and others.

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## P-SERIES FURNACE TYPES

### SMALL-SCALE BATCH PROCESSING

The multipurpose **NXKP series** is a compact and economical choice for use in small-scale processing as well as for process development purposes.

NXKP SERIES	Diameter	Height	Load Capacity
NXKP-409	15½" / 400 mm	35½" / 900 mm	660 lbs / 300 kg
NXKP-412	15½" / 400 mm	47¼" / 1,200 mm	880 lbs / 400 kg
NXKP-609	23½" / 600 mm	35½" / 900 mm	1,300 lbs / 600 kg
NXKP-612	23½" / 600 mm	47¼" / 1,200 mm	1,700 lbs / 800 kg
NXKP-812	31½" / 800 mm	47¼" / 1,200 mm	2,200 lbs / 1,000 kg

### SMALL TO HIGH VOLUME BATCH PROCESSING

The heavy-duty **NXHP & NXP series** provide flexibility for a wide range of applications. These systems are designed to have fast heat-up and cooling rates, as well as uniform temperature and atmosphere.

NXHP SERIES	Dimensions (W x H x L)	Load Capacity
NXHP-669	23½" x 23½" x 35½" / 600 x 600 x 900 mm	1,700 lbs / 800 kg
NXHP-6612	23½" x 23½" x 47¼" / 600 x 600 x 1,200 mm	2,200 lbs / 1,000 kg
NXHP-9812	35½" x 31½" x 47¼" / 900 x 800 x 1,200 mm	3,300 lbs / 1,500 kg
NXHP-9818	35½" x 31½" x 71" / 900 x 800 x 1,800 mm	5,500 lbs / 2,500 kg
NXHP-101015	39½" x 39½" x 59" / 1,000 x 1,000 x 1,200 mm	5,500 lbs / 2,500 kg
NXHP-101018	39½" x 39½" x 71" / 1,000 x 1,000 x 1,800 mm	6,600 lbs / 3,000 kg

NXP SERIES	Diameter	Height	Load Capacity
NXP-615	23½" / 600 mm	59" / 1,500 mm	2,200 lbs / 1,000 kg
NXP-620	23½" / 600 mm	78¾" / 2,000 mm	2,600 lbs / 1,200 kg
NXP-815	31½" / 800 mm	59" / 1,500 mm	3,300 lbs / 1,500 kg
NXP-820	31½" / 800 mm	78¾" / 2,000 mm	3,850 lbs / 1,750 kg
NXP-825	31½" / 800 mm	98½" / 2,500 mm	4,400 lbs / 2,000 kg
NXP-1015	39" / 1,000 mm	59" / 1,500 mm	4,400 lbs / 2,000 kg
NXP-1020	39" / 1,000 mm	78¾" / 2,000 mm	5,500 lbs / 2,500 kg
NXP-1025	39" / 1,000 mm	98½" / 2,500 mm	6,600 lbs / 3,000 kg
NXP-1215	47¼" / 1,200 mm	59" / 1,500 mm	6,600 lbs / 3,000 kg
NXP-1220	47¼" / 1,200 mm	78¾" / 2,000 mm	8,400 lbs / 3,800 kg
NXP-1225	47¼" / 1,200 mm	98½" / 2,500 mm	9,900 lbs / 4,500 kg
NXP-1230	47¼" / 1,200 mm	118" / 3,000 mm	11,570 lbs / 5,250 kg
NXP-1625	61" / 1,550 mm	98½" / 2,500 mm	13,200 lbs / 6,000 kg
NXP-1630	61" / 1,550 mm	118" / 3,000 mm	15,400 lbs / 7,000 kg
NXP-1635	61" / 1,550 mm	137¾" / 3,500 mm	17,600 lbs / 8,000 kg
NXP-1645	61" / 1,550 mm	177" / 4,500 mm	22,000 lbs / 10,000 kg

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NITRIDING/NITROCARBURIZING  
SYSTEM WITH UNITED PROCESS  
CONTROLS' PROTHERM™  
PROCESS CONTROLLER



NXKP SERIES



NXHP SERIES



NXP SERIES

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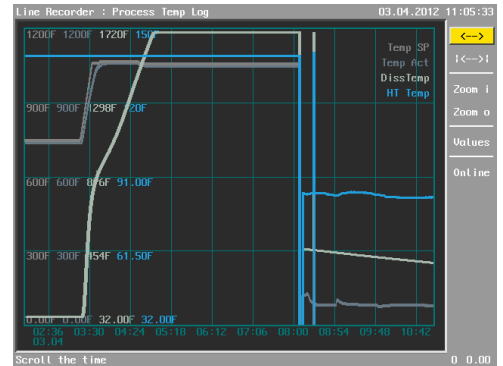
## P-SERIES PROCESS CONTROLS

The **PROTHERM™** series of controllers enable flexible and convenient control of a Nitrex batch-type furnace, providing the ability to run, monitor, record, and archive even the most complex nitriding or nitrocarburizing processes.

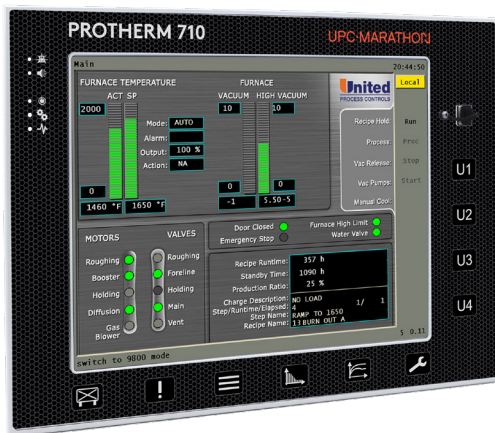
PROTHERM™ 470, 510, 610, and 710 controllers include features such as live trending, built-in data logging, integrated web server, SCADA connectivity, automatic batch logs, as well as an array of maintenance and safety functions.

## P-SERIES

NITRIDING/NITROCARBURIZING  
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User receives live feedback of process parameters via an integrated chart recorder.



PROTHERM™ 710 TOUCH



SCADA  
connectivity



PROTHERM™ 470



PROTHERM™ 610

### KEY FEATURES

- PID control loops to regulate configured process parameters such as temperature, furnace pressure, flows as well as atmosphere parameters (e.g.:  $K_N$ ,  $K_C$  and  $K_O$ )
- Real-time control of all process stages
- Process parameters configured with alarm limits
- Notification and processing of alarms
- Chart recorder to provide continuous recording of process variables
- Recipe library to create and save up to 999 recipes
- Built-in user and group security with multiple access levels

### INTEGRATED WEB SERVER

- Facilitates the user to access the PROTHERM™ controller from any PC through a web browser
- Available functions include the ability to access the status overview of the controller, monitor work in progress, read current parameters, observe and download graphs, trends and alarms of the active recipe
- Access up to 30 days of process logs stored in ASCII format for data processing and analysis with a spreadsheet software or portable document format (PDF)
- Built-in backup and restore utility to protect all system data and to quickly restore operations



# NITREX

## P-SERIES PROCESS CONTROL & SYSTEM OPTIONS

The H2Smart™ is at the heart of the P-Series process control. It is an integrated sampling system that measures hydrogen content with high accuracy in nitriding and nitrocarburizing atmospheres.

The unique design with a variable output integral pump allows the set sampling flow rate to be automatically maintained. A flow control circuit complete with pump saturation warning and flow alarm insure reliable sampling and accurate readings.

## OPTIONAL AUXILIARY EQUIPMENT

## P-SERIES

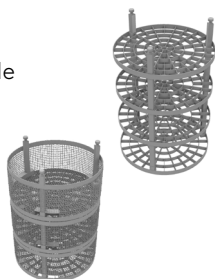
NITRIDING/NITROCARBURIZING  
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The H2Smart™ is a powerful hydrogen sampling tool for precise measurement of the furnace atmosphere.

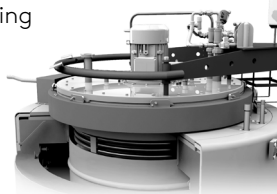
### RACKING

Easy-to-assemble Inconel baskets and trays constructed for safe and easy loading.



### ACCELERATED COOLING

Internal accelerated cooling system to reduce cooling time by 40% or more.



### AMMONIA DISSOCIATOR

Economical and safe supply of dissociated ammonia.



### EFFLUENT NEUTRALIZER

Eliminates residual ammonia and/or other pollutant gases from nitriding/nitrocarburizing system exhaust.



### WATER COOLING

Recirculates clean cooling water to prolong the longevity of furnace elements.



### NITROCARBURIZING

NitroCarb™ oxygen probe used with H2Smart™ for nitrocarburizing process control.



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