

REAL-TIME INDUCTION PROCESS QUALITY CONTROL

With nearly 30 years of heat treat data acquisition experience, United Process Controls engineers have taken their technical know-how and applied it to induction heat treat. The PROTHERM 9800 INDUCTION is a data acquisition and alarm package for induction heat treating equipment that meets industry standards requirements and ultimately provides precise and reliable process monitoring.

Our technical staff is able to integrate this control solution with any induction heat treat equipment regardless of age.



FEATURES

- Full compliance with CQI-9
- Cost-effective module configurations for new installations or retrofits

INDUCTION PROCESS ANALYSIS

Accurate, Continuous, Automatic Measurement

The electrical resistivity of the part and the magnetic permeability of the metal are factors that influence the redistribution of heat within the induction hardened part. This leads to changes of the depth of current in the part at a given frequency.

PROTHERM 9800 INDUCTION monitors current, voltage, and frequency to the coil in real-time, enabling to determine whether or not uniform heating, proper flux density and depth are achieved.

Typical Monitored / Logged Parameters

- Power
- Voltage
- Frequency
- Temperature
- Water Flow
- Scan Rate
- Other signals from the machine that can be measured



PROTHERM 9800 INDUCTION CONTROL SOLUTION

INDUCTION PROCESS ANALYSIS

Parameter Set Points & Alarms

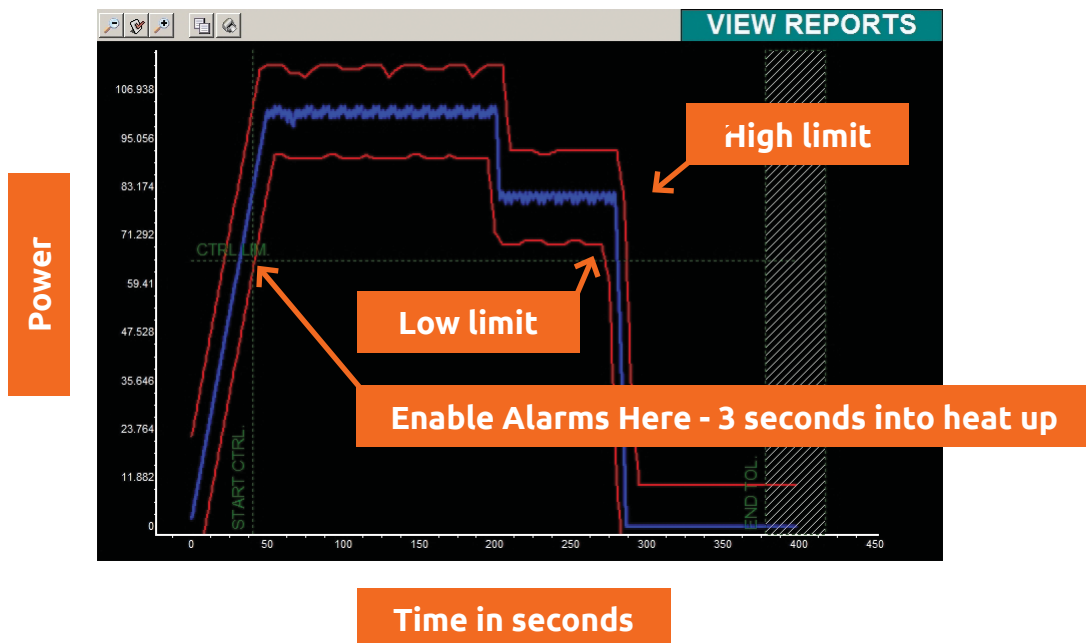
PROTHERM 9800 INDUCTION allows you to enter High, Low, and the number of accepted deviations for each of the monitored parameters. This feature enables the

system to alarm when one of the parameters, established for a particular part, is out of the band. Any action taken, once induction is in process, may be determined by you.

RECIPIES		CHANEL(1-6)		Power(kW)		Voltage(V)		Frequency(kHz)		Water Flow(l/mn)		Water Temp.(°C)		
	Lim.	Env.		Lim.	Env.		Lim.	Env.		Lim.	Env.		Lim.	Env.
High	0	10	High	0	0	High	0	0	High	0	0	High	0	0
Low	0	10	Low	0	20	Low	0	0	Low	0	0	Low	0	0
Nb.Dev.	0	2	Nb.Dev.	0	0	Nb.Dev.	0	0	Nb.Dev.	0	0	Nb.Dev.	0	0
Lim.Ctrl.	65		Lim.Ctrl.	0		Lim.Ctrl.	0		Lim.Ctrl.	0		Lim.Ctrl.	0	
Start.End	Tol.	E-Shift.	Start.End	Tol.	E-Shift.	Start.End	Tol.	E-Shift.	Start.End	Tol.	E-Shift.	Start.End	Tol.	E-Shift.
40	0	20	5	5	0	0	0	0	0	0	0	0	0	0

If the machine has the capability to divert parts to a non-compliant bin, PROTHERM 9800 INDUCTION can send a status output to the material handling of the service machine. You may also program a quantity of out of band runs before the system stops. In each case, the system will alarm and then prompt the operator to decide whether or not to continue with operation of the machine.

A prompt window may also be set up for the alarm function. Alarms are enabled only when the process is inside this window. Additionally, you can set a time delay to activate the alarm function after a process has started, and a lower control limit for any of the monitored parameters. Parameters that are in an out-of-band condition will initiate an alarm. Alarm bands are set as part of the recipe for each part.



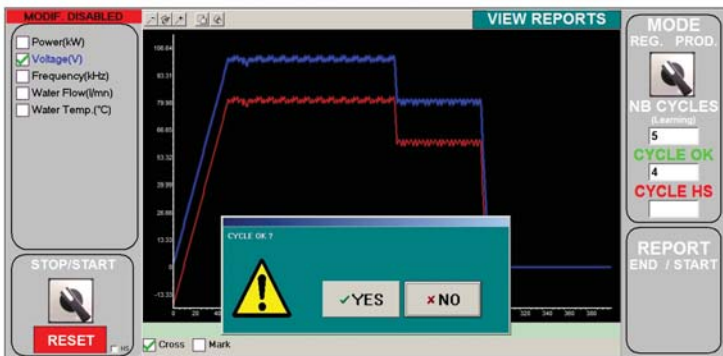
INDUCTION PROCESS ANALYSIS

OTHER CONTROL SOLUTIONS

Learning Modes & Reports

PROTHERM 9800 INDUCTION can run in Learning mode. In this mode, basic parameters of the part are entered into the system, and the part is processed accordingly. If the results of metallurgical test performed on the hardened part are not favorable, the parameters are corrected, and the next part is processed. When uniformity is attained, the optimal recipe is saved for that part.

PROTHERM 9800 INDUCTION can also be configured to interface with your equipment to start trial runs or production runs.



PROTHERM 9800 has an extremely fast sample rate : 2 ms for digital inputs and 10 ms for analog data collection. Historical reports are available for each part run and can be exported to PDF format.

