

# Process Control and Documentation

## Controller

Nabertherm has many years of experience in the design and construction of both standard and custom control alternatives. All controls are remarkable for their ease of use and even in the basic version have a wide variety of functions.

### Standard Controllers

Our extensive line of standard controllers satisfies most customer requirements. Based on the specific furnace model, the controller regulates the furnace temperature reliably and is equipped with an integrated USB-interface for documentation of process data (NTLog/NTGraph).

The standard controllers are developed and fabricated within the Nabertherm group. When developing controllers, our focus is on ease of use. The user can choose between 17 languages. From a technical standpoint, these devices are custom-fit for each furnace model or the associated application. From the simple controller with an adjustable temperature to the control unit with freely configurable control parameters, stored programs and PID microprocessor control with self-diagnosis system, we have a solution to meet your requirements.



B400



C440



P470



B410/C450/P480

### Allocation of the Standard Controller to the Furnace Groups

	LT 02/13 CR	LHT 01/17 D	LHT 03/17 D	LHT 02/17 LB Speed	HTCT 01/16	N 7/H - N 41/H	LE 1/11 - LE 14/11	L 1/12 - LT 15/12	N 7/H - N 17/HR
Catalog page	4	6	6	7	8	10	14	12	15
Controller									
R7							●		
3216								○	
B400						●			●
C440						○			○
P470			●	●					
B410								●	
C450	●				●			○	
P480		●							

### Functionality of the Standard Controllers

	R7	3216	B400/ B410	C440/ C450	P470/ P480
Number of programs	1	1	5	10	50
Segments	1	8	4	20	40
Extra functions (e.g. fan or autom. flaps) maximum			2	2	2-6
Maximum number of control zones	1	1	1	1	3
Drive of manual zone regulation			●	●	●
Auto tune		●	●	●	●
Real-time clock			●	●	●
Status messages in clear text			●	●	●
Data input via jog dial and buttons			●	●	●
Entering program names (i.e. "Sintering")			●	●	●
Keypad lock			●	●	●
User administration			●	●	●
Skip-button for segment jump			●	●	●
Program entry in steps of 1 °C or 1 min.	●	●	●	●	●
Start time configurable (e.g. to use night power rates)			●	●	●
Switch-over °C/F	○	○	●	●	●
kWh meter			●	●	●
Operating hour counter			●	●	●
Set point output			●	●	●
NTLog Basic for Nabertherm Controller: Recording of process data with USB-flash drive			●	●	●
Interface for VCD software			○	○	○
Malfunction memory			●	●	●
Number of selectable languages			17	17	17

- Standard
- Option

## Supply Voltages for Nabertherm Furnaces

1-phase: All furnaces are available for 110 V - 240 V, 50 or 60 Hz.

3-phase: All furnaces are available for 200 V - 240 V and/or 380 V - 480 V, 50 or 60 Hz.

The connecting rates in the catalog refer to the standard furnace with 400 V (3/N/PE) respectively 230 V (1/N/PE).

## Process Control and Documentation

### Processdocumentation

#### Data Storing of Nabertherm Controllers with NTLog Basic

The Controller B400/B410, C440/C450 and P470/P480 are equipped with a USB interface as standard, which allows data recording via the NTLog Basic. The process data is recorded with a client-side USB-stick which is inserted during the process.

The process documentation with NTLog Basic requires no additional thermocouples or sensors. Only data recorded which are available in the controller.

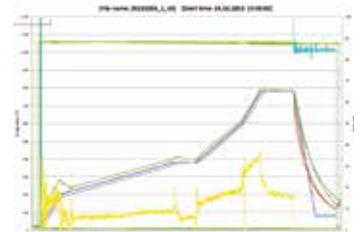
The data stored on the USB stick (up to 80,000 data records, format CSV) can afterwards be evaluated on the PC either via NTGraph or a spreadsheet software used by the customer (e.g. MS Excel).

For protection against data manipulation the generated data records contain checksums.

#### Visualization with NTGraph

The process data from NTLog can be visualized either using the customer's own spreadsheet program (e.g. MS-Excel) or NTGraph (Freeware). With NTGraph Nabertherm provides for a user-friendly tool free of charge for the visualization of the data generated by NTLog. Prerequisite for its use is the installation of the program MS Excel for Windows (version 2003/2010/2013). After data import presentation as diagram, table or report can be chosen. The design (color, scaling, reference labels) can be adapted by using prepared sets.

NTGraph is available in seven languages (DE/EN/FR/SP/IT/CH/RU). In addition, selected texts can be generated in other languages.



NTGraph, a freeware for the easy-to-read analysis of recorded data using MS Excel

#### VCD-Software for Visualization, Control and Documentation

Documentation and reproducibility are more and more important for quality assurance. The powerful VCD software represents an optimal solution for single multi furnace systems as well as charge documentation on the basis of Nabertherm controllers.

The VCD software is used to record process data from the controllers B400/B410, C440/C450 and P470/P480. Up to 400 different heat treatment programs can be stored. The controllers are started and stopped via the software. The process is documented and archived accordingly. The data display can be carried-out in a diagram or as data table. Even a transfer of process data to MS Excel (.csv format \*) or the generation of reports in PDF format is possible.

#### Features

- Available for controllers B400/B410/C440/C450/P470/P480
- Suitable for operating systems Microsoft Windows 7 or 8/8.1 or 10 (32/64 Bit)
- Simple installation
- Setting, Archiving and print of programs and graphics
- Operation of controllers via PC
- Archiving of process curves from up to 16 furnaces (also multi-zone controlled)
- Redundant saving of archives on a server drive
- Higher security level due to binary data storage
- Free input of charge data with comfortable search function
- Possibility to evaluate data, files can be converted to Excel
- Generation of a PDF-report
- 17 languages selectable



VCD Software for Control, Visualisation and Documentation