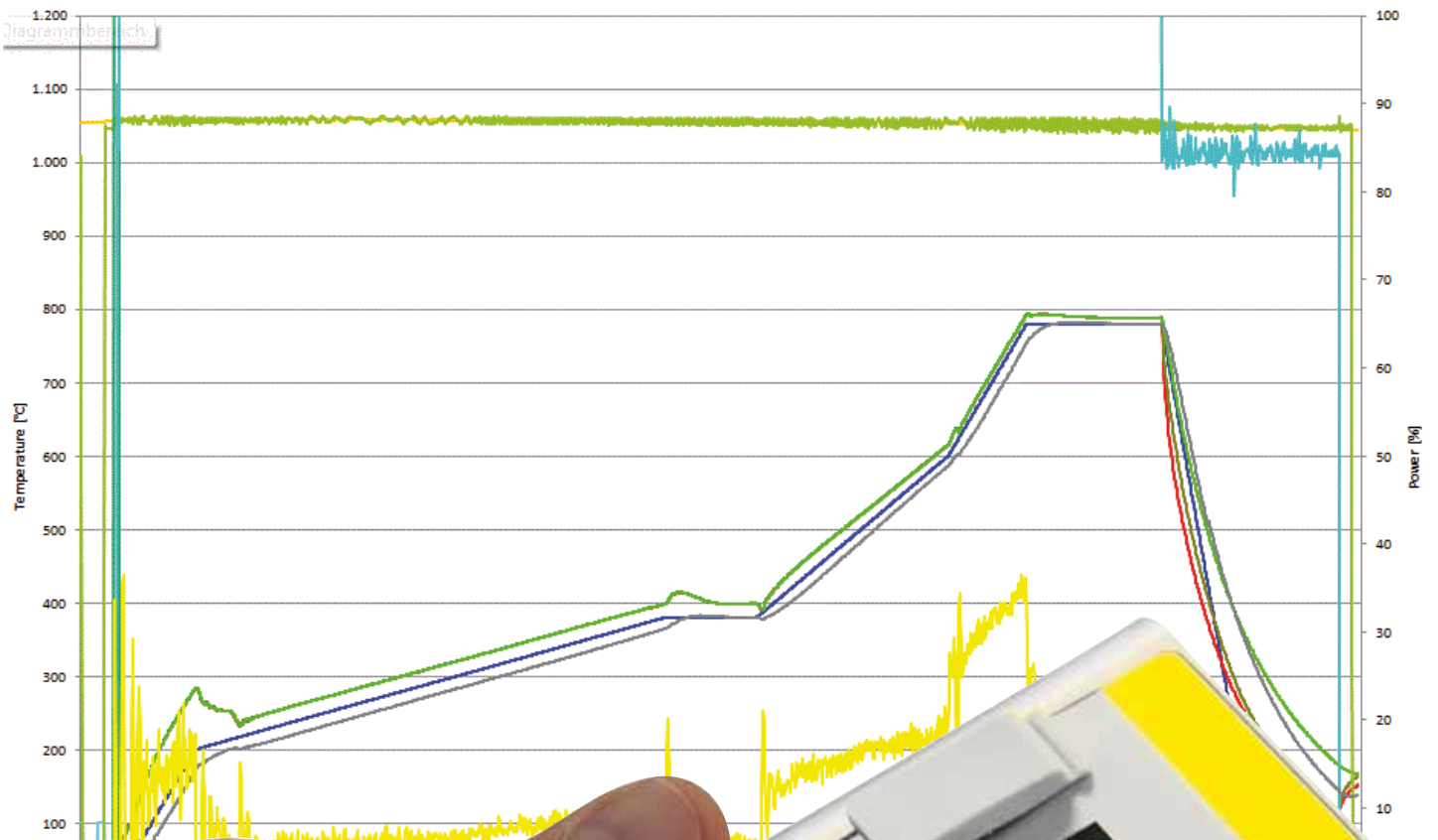


[File name: 20130204\_1\_43] [Start time: 04.02.2013 15:49:59]



**Nabertherm**

Program number: 01  
 Program name:   Use preset  
 Max. furnace temperature: 1.600  
 Controller type: B400/B410  
 Controller Version: Up to V1.24

Repeat program     Charge control     Manual holdback

Segment Nr	Start temp °C	End temp °C	Time hh:mm	Rate %/h	Extra 1	Extra 2	Extra 3	Extra 4	Extra 5	Extra 6	Cooling
1	0	1.300		100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	1.300	900	00:10		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	900	900	INFINITE		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	END				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# Process Control and -Documentation



# Process Control and -Documentation

## Controller

The Nabertherm controllers convince with their intuitive operation and a contemporary design. They are operated via a central control dial (Jog Dial). Temperatures and program information are presented in a clear, high-contrast LC display. Optimum temperature uniformity over the entire temperature range through multi-stage PID parameterization.

In developing the controller, the ease of use was the focus. For convenient operation, the controller may be taken off from the holder at the kiln. The program is entered in plain text, so that all steps are easy to follow. Firing curves can be saved under their name for unique assignment (e.g. glaze firing). The user can choose between 17 languages.

When connected to a kiln for firing ceramics, five sample programs are stored in the controller (two bisque firings and three glaze firings). These programs can easily be used as a basis for an individual adaptation to the actually required firing curve. You can overwrite and save again with the required times and temperatures. Via an integrated real time clock, the kiln can be started delayed e.g. in the evening for a firing overnight.

Each controller of series B400 to P470 is equipped as standard with a USB interface. The firing will be documented on a USB stick, which has to be inserted during the operation. After the firing has been finished it can be easily read-out using the software NTGraph (freeware), which is based on Microsoft Excel as user interface. The visualization is presented in tabular form or as a clearly colored graphic.



B400



C440



P470

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

	N 100 - N 2200/H	NW 150 - NW 1000/H	N 140 E - N 500 E	N 40 E - N 100 E	Top 16/R - Top 220	HO 70. - HO 100	NB 150 - NB 600	GFM 420 - GFM 1425	GF 75 - GF 1425	IF 30 - F 110	IF 220
Catalog page	8-9	10-11	12-13	14	21	23	27	31	32-33	35	35
Controller											
B400	●	●	●	●	●	●	●				
C440	○	○	○	○	○	○	○	●	●	●	
P470	○	○	○	○		○	○	○	○	○	●

### Functionality of the Standard Controllers

	B400	C440	P470
Number of programs	5	10	50
Segments	4	20	40
Extra functions (e.g. fan or autom. flaps) maximum	2	2	2-6
Maximum number of control zones	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	●	●	●
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	●	●	●
Malfunction memory	●	●	●
kWh meter	●	●	●
Operating hour counter	●	●	●
NTLog Basic for Nabertherm controller: recording of process data with USB-flash drive	●	●	●
Interface for VCD-software	○	○	○
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).

## Controller Operation



1. Display
2. Main operating button (Jog Dial) (turn/push)
3. Button for "Start/Hold/Stop"
4. Button for "Menu" selection e.g. save, copy or delete program
5. Button for "Back" function
6. Button to activate the Info-Menu  
e.g. final consumption in kWh, operating hours
7. USB interface

## Displays and Functions



Entering a new program



Loading saved programs



Enter the start time (day and time)



Saving a program under the program name



Display of power consumption in kWh



Remaining time display of the current program



Controller removable for ease of use



Documentation of started programs on a USB stick

# Process Control and -Documentation

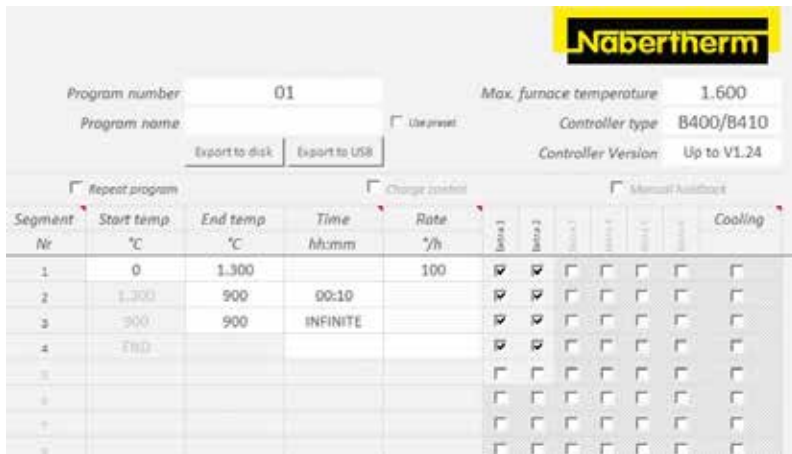
## Processdocumentation

### Data Storing of Nabertherm Controllers with NTLog Basic

The controller B400/B410, C440/C450, 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.

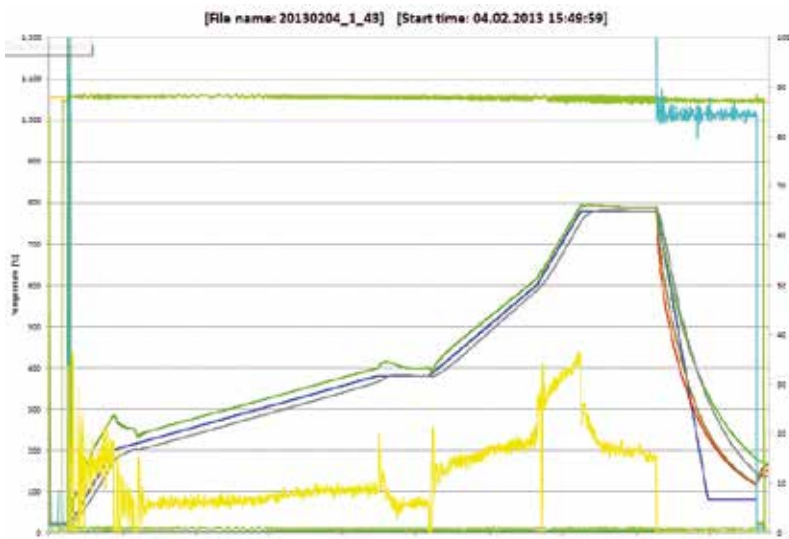


The process documentation with NTLog Basic requires no additional thermocouples or sensors. Only data recorded which are available in the controller. The data stored on the USB stick (up to 80,000 data records, format CSV) can afterwards be evaluated on the PC either via NTGraph or a spreadsheet software used by the customer (e.g. MS-Excel). For protection against data manipulation the generated data records contain checksums.



### Software NTEdit for Entering Programs on the PC

Entering programs is simplified considerably by using the software NTEdit (Freeware). The program can be entered on the PC and then be imported into the controller with a USB stick. The display is tabular or graphical. The program import in NTEdit is also possible. With NTEdit Nabertherm provides a user-friendly free tool. A prerequisite for the use is the client installation of MS-Excel for Windows (2007/2010/2013). NTEdit is available in eight languages (DE/EN/FR/SP/IT/CH/RU/PT).



### 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 an additional 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