

## LT 9/11/SW with Controller C 550

with scale and VCD-Software package for  
process documentation



Electrically heated muffle furnace with integrated scale  
The furnace is equipped with either a flap door (L) or lift door (LT) at no extra charge.

### 1. Scope of Supply

- Electrically heated weighing furnace with
  - Controller C550
  - Integrated VCD-Software
  - Scale EW-2200-2NM

### 2. Intended Use

- The furnace is designed for weight loss determination.
- Only materials with known characteristics and melting temperatures may be used. Check the material safety data sheets if necessary.
- Use of the furnace for any other purpose whatsoever such as processing products other than those intended or handling hazardous substances or substances posing a health hazard constitutes improper use and must be agreed upon with Nabertherm.

- Operating the furnace with explosive gases or mixtures, including explosive gases or mixtures created as a result of heating/drying, is prohibited.
- The balance must be protected against direct airflow and vibrations during the weight-loss process
- Pressure variation could influence the weighting results
- Static electrification and electromagnetic disturbances should be avoided
- The convection inside the furnace chamber could have influence to the measuring curve via the weighting platform
- This furnace features no safety technology for processes which produce combustible mixtures, for example debinding. If the furnace is still used for such processes despite this fact, the concentration of organic gas mixtures in the furnace must never exceed 3% of the lower explosion limit (LEL). This pre-requisite applies not only to normal operation but, in particular, to exceptional situations such as process disruptions (caused, for example, by the failure of a power unit). Customer must ensure that the furnace is adequately ventilated and vented.

### 3. Applied norms and specifications

#### 3.1. General Norms and Directives

- EN 61010-1
- EN 61000-6-1, EN 61000-6-3
- RoHS directive 2011/65/EU

#### 3.2. Customer's specifications

- Not considered

### 4. Technical specifications

Inner dimensions (wxdxh):	230 x 240 x 170 mm
Outer dimensions (WxDxH):	415 x 455 x 740+240 mm
Volume:	9 litres
Weight:	50 kg
Power rating:	3,3 kW
Supply voltage:	220-240 V, 1/N/PE (2PE) 50/60 Hz
Max. operating temperature:	1100 °C*
Heat-up time (without load):	65 min. to Tmax – 100 K (if connected at 230 V, 1/N/PE)

\*Note:

Continuous operation at maximum temperature can lead to increased wear of the heating elements, thermocouples or isolation. We recommend operation at approx. 50 °C below the maximum temperature.

External dimensions vary depending on additional equipment. Exact dimensions on request.

Scale EW-2200-2NM

Weight range:	2200 g (1350 g effective)
Weight of plunger:	850 g

Readability:	0,01 g
Calibration value:	0,1 g
Minimum load:	0,5 g
Interface:	RS 232/USB

5. Customized furnace design

- Housing manufactured from high grade structured stainless steel
- Dual shell housing
- Exhaust air outlet in the furnace rear wall
- Switching of the heating elements by electronic relay
- Adjustable air inlet in the door
- Door opening supported by springs
- Ceramic stamp through the furnace bottom
- Weighting platform with special ceramic connection rod and pad
- High precision scale for documenting and monitoring the temperature curve and the loss during combustion
- Lift-door with hot surface facing away from the operator
- Exclusive use of insulation materials without categorization according to EC Regulation No 1272/2008 (CLP). This explicitly means that alumino silicate wool, also known as “refractory ceramic fiber” (RCF), which is classified and possibly carcinogenic, is not used.
- Heating from two sides by ceramic heating plates with integrated heating wire which is safeguarded against fumes and splashing, and easy to replace
- Thermocouple type K
- Temperature uniformity of  $\Delta T$  20 K within the work space at temperatures  $> 800^{\circ}\text{C}$



6. Additional equipment in the scope of supply

- Vent with fan 1,00 pc 550,00 -25,00 % 412,50
  - Supports the venting of gases and vapours from the furnace chamber
  - Exhaust air cross section  $\varnothing$  81,2 mm
  - Controller B500/B510 and C540/C550 can be used to activate the fan automatically. For model L(T) 9/14 and L(T) 15 the maximum connected load for this extra function is 100W
  - No combination with protective gas connection and gassing systems
  - Article number 631000812



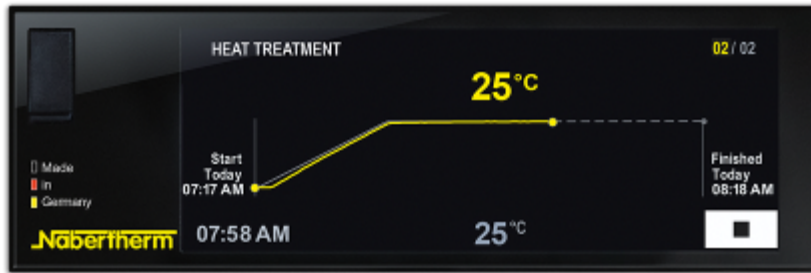
7. Controls, switchgear and process documentation

7.1. Nabertherm Controller Series 500

- The Controller Series 500 offers a unique range of features and intuitive operation. In combination with the free smartphone app "MyNabertherm", the operation and monitoring of the furnace becomes even easier and more powerful than ever before.
- Operation and programming by a high-contrast, large touch panel that displays exactly the information that is relevant at that particular moment.



- Transparent, graphical display of temperature curves
- Clear display of process data



## 7.2. Controller C550

- Colorful, high-contrast 6.8-inch touch display
- Convenient data input on large touch screen
- Graphic and tabular display of the program
- Detailed information menu with:
  - Time and date
  - Program run times (run time, remaining run time)
  - Operating hours counter
  - Integrated kWh counter (energy counter)
  - Error messages in plain text display
  - Display of controller setting values
- Language switching, available in the following languages:
  - DE, EN, FR, IT, ES, RU, DA, NL, PL, PT, SE, CZ, HU, TR, RO, NO, EE, FI, HR, LV, LT, SK, SL, CN
- Input of the ramps as
  - gradient (e. g. 100 K/h to 600 °C)
  - by time and temperature (e. g. in 6 hours up to 600 °C)
- Input of temperatures and times in steps of 1° and 1 min
- Delayed start time of the furnace adjustable via real-time clock
- PID control parameter input in freely selectable temperature steps
- Temperature unit changeable: °C / °F
- Controller interlock with password lock to protect against operating errors
- Copy and delete function for programs
- 10 programs with 20 segments each can be stored
- Program favorite list for quick access
- Filtering of the program list according to self-created categories
- Control of one heating zone
- Measurement range calibration option with up to 10 selectable supporting points
- Measuring accuracy  $\pm 1$  °C, smallest possible rate 1°C/h
- Self-optimization function for single-zone furnaces
- Up to two segment-wise, switchable functions e.g. relays for flaps, gassing systems, cooling fan, etc., depending on furnace equipment



Controller C550



Intuitive touch screen



Easy program entry and control



Precise temperature control

- Extra functions can be named in plain text = flap, gassing etc.
- Extra functions can remain switched on even after program end (e.g. cooling fan)
- Six alarms with adjustable behavior
  - Alarm trigger: [BAND / MAX / MIN / program end] and external input
  - Adjustable monitoring ranges (ramp, hold time, etc.)
  - Reaction to alarm may require additional equipment such as signal lamp, acoustic alarm, relay, etc.
- Skip function for segment jump in a running program
- Program start also possible at current furnace temperature
- Adjustable modes for power failure behavior
  - Continuation of program on power recovery without consideration of duration of power failure or temperature drop
  - Continuation of program in case of power failure < 2 min., otherwise abort
  - Continue of program, if temperature drop less than 50 K, otherwise abort
  - Program stop without consideration of duration of power failure or temperature drop

DOMINIQUE DUTSCHER SAS

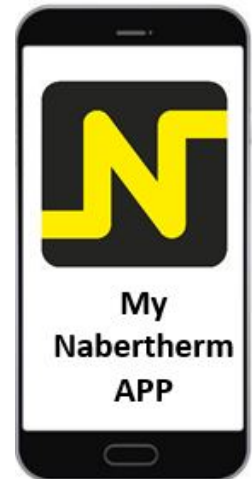
- User administration with three levels and different access rights for increased process reliability
  - Operator = basic functions for starting/stopping the furnace
  - Supervisor = additional rights for program input/modification
  - Admin = additional system-relevant access rights to parameters, etc.
- Wi-Fi interface for status monitoring with mobile end devices via the MyNabertherm app.
- Internal overtemperature protection with automatic shutdown if the set target temperature is exceeded by 30 °C for three minutes
- Integrated gradient monitoring with adjustable trigger values (temperatures and deviations): when the setpoint temperature is exceeded in the heating ramp, the furnace heating switches off
- NTLog: USB interface for recording process data, evaluation via NTGraph possible
- Import and export function via USB port for simplified service checks or program import (see description NT-Edit)
- Online tutorials available: [www.nabertherm.com/tutorials/controller](http://www.nabertherm.com/tutorials/controller)



User levels

### 7.3. MyNabertherm App

- Powerful and free digital add-on for Nabertherm 500 Series Controllers.
- Monitor the process progress of your Nabertherm furnaces easily online from the office, the workshop, on the road or wherever you are. With the app, you always keep in touch.
- The app functions for Nabertherm - furnace monitoring at a glance:
  - Convenient, simultaneous monitoring of multiple Nabertherm furnaces.
  - Total overview of all furnaces (dashboard)
  - Individual overview
  - Display of active / inactive furnaces
  - Operating status
  - Selection of current process data
- Display options for each furnace
  - Overview of program progress
  - Display of furnace name, program name, segment number
  - Display of start time, program run time, remaining run time and approximate time of program end.
  - Status of extra functions such as fresh air fan, exhaust air flap, gassing, etc.
  - Operating modes
- Push notifications in case of error messages
  - Push notification on the lock screen
  - Display of fault messages with fault text in the individual overview and the current message list



Convenient monitoring of one or multiple Nabertherm furnaces simultaneously

- Service contact
  - Store furnace data and get fast support
- Available in the following languages:
  - DE, EN, FR, IT, ES, RU, DA, NL, PL, PT, SV, CS, HU, TR, RO, NO, EE, FI, HR, LV, LT, SK, SL, CN
- Requirements
  - The furnace must be able to be connected on site via WLAN and must be connected to the Internet. Appropriate settings may need to be set up on site.
  - For cell phones with Android (from version 9) and IOS (from version 13)
- Download Google Playstore: [MyNabertherm – Google Playstore](#)
- Download Apple Appstore: [MyNabertherm - Apple Appstore](#)



Display of program progress for each furnace

7.4. Freeware NTEdit for program editing on a PC

- Clearly structured editing of programs on a PC
- Transfer to the controller via customer’s USB stick
- Import function of programs via customer’s USB stick
- Graphical overview of the set program on a PC
- Language selection of: DE/EN/FR/IT/SP/RU/ZN/PT
- Download is provided at <http://www.nabertherm.com/download/>
- Use of MS Excel required
- For PCs with Microsoft Office 2007/2010/2013 and Office 365 for Windows (32/64Bit)



7.5. VCD Software incl. Ethernet-port

Software for visualization, controls and documentation of up to 16 furnaces, equipped with following controllers:

- B500/510, C540/550, P570/P580;
- B400/B410, C440/C450, P470/P480;
- with additional hardware (price on request) also B130, B150, B180, C280, C290, C295, P300, P310, and P330, version 3.0 or better

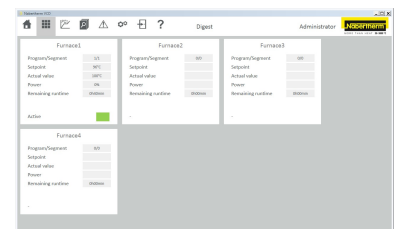


Example with three controller

The furnace will be connected to a standard PC, provided by the customer. Access from several PCs to one furnace is not possible. The price is valid for one furnace. For each additional furnace an Ethernet module (hardware) is necessary.

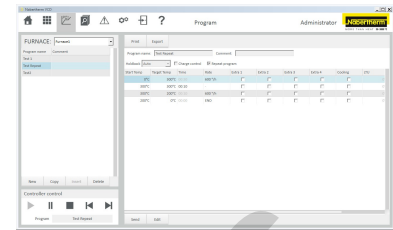
Performance

- Parallel operation/monitoring and documentation of up to 16 furnaces including additional heating zones (if available)
- Archiving, graphical and numerical presentation of process data
- Programming of heat treatment cycle incl. all functions directly on the computer
- Remote start of a furnace run via the VCD software
- Export of archived data as a report (PDF) or text file (CSV)
- Free text input of batch data with search function

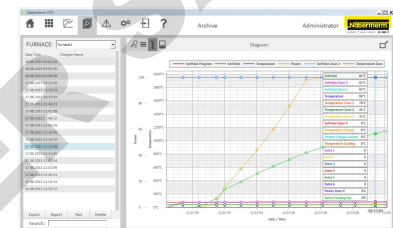


Graphics furnace overview (version with 4 furnaces)

- Program management by means of program lists (selection of programs, program creation, copying, deleting)
- Program input in a table form, plain text labeling of the program name with additional comments for users
- Display of status information: Program, segment, actual/setpoint value, heat output, operating time, remaining operating time
- Furnace-specific archive function: completed records can be retrieved from the archive and, if necessary, exported (CSV/XML format) or can be printed as a report.
- Multi-level user administration [Operator] / [Supervisor] / [Admin] with different access rights to the software
- Locking function
- Menu messages with search filter for specific events
- Menu settings with the following functions
  - Adjustment of the furnace name (customer-specific names) and sequence
  - Adjustment of the process data description with customer-specific names
  - Adjusting the user management
  - Language selection: DE / EN / FR / IT / ES / RU / NL / PL / CN / TR / RO / N / DK / PT / SE / CZ / HU, other languages on request
  - Temperature unit selectable in °F or °C



Tabular process overview



Graphical display of heat treatment curve

#### Minimum PC and network requirements

- Operating system: Microsoft Windows 10 (32/64 bit)
- Processor: Pentium 800 MHz PC
- RAM: at least 2 GB
- Hard disk: min. 20 GB free memory
- Monitor resolution 1280x720 (16:9) pixels or better. Recommended resolution 1920x1080 pixels
- USB interface, only required when connecting a B1xx, C2xx or P3xx controller
- Ethernet interface (RJ45)
- Network cable length max. 100 meters, CAT 5, shielded cable; for longer distances, the use of repeaters is recommended.
- Data transmission between PC and controller should be done by a direct, independent network. For external access to files on the PC, an additional Ethernet card is required for stability reasons.

#### Scope of delivery

- Software on CD-ROM
- Acrobat Reader Software to read the operating instructions
- Software .Net Framework 4.5
- Instructions in German / English as PDF on CD
- Communication-module (Ethernet) for connection to the controller module in the switchgear including web server for displaying the furnace status in a web browser in the same network
- Network cables (5m) for connecting a furnace to the PC