

# Arts & Crafts



## Kilns and Accessories

**Pottery**  
**Porcelain Painting**  
**Glass Painting**  
**Fusing**  
**Decorating**  
**Raku**



### **Made in Germany**

Nabertherm with 500 employees worldwide have been developing and producing industrial furnaces for many different applications for 70 years. As a manufacturer, Nabertherm offers a very wide and deep range of furnaces. 150,000 satisfied customers in more than 100 countries offer proof of our commitment to excellent design, quality and cost efficiency. Short delivery times are ensured due to our complete inhouse production and our wide variety of standard furnaces.

### **Setting Standards in Quality and Reliability**

Nabertherm does not only offer a wide range of standard furnaces. Professional engineering in combination with in house manufacturing provide for individual project planning and construction of tailor-made thermal process plants with material handling and charging systems. Complete thermal processes are realized by customized system solutions.

Innovative Nabertherm control technology provides for precise control as well as full documentation and remote monitoring of your processes. Our engineers apply state-of-the-art technology to improve the temperature uniformity, energy efficiency, reliability and durability of our systems with the goal of enhancing your competitive edge.

### **Global Sales and Service Network – Close to you**

Nabertherm's strength is one of the biggest R&D departments in the furnace industry. In combination with central manufacturing in Germany and decentralized sales and service close to the customer we can provide for a competitive edge to live up to your needs. Long term sales partners in all important world markets ensure individual on-site customer service and consultation. There are certainly reference customers who are using similar furnaces or systems close to you.



### **36 Months Warranty**

Another quality feature is the 3-year warranty for the Arts & Crafts kilns. Due to the processing of high quality materials and the handicrafts manufacturing this is a matter of course for us.

### **Customer Service and Spare Parts**

Our professional service engineers are available for you worldwide. Due to our complete inhouse production, we can despatch most spare parts from stock over night or produce with short delivery time.

### **Experience in Many Fields of Thermal Processing**

In addition to furnaces for Arts & Crafts, Nabertherm offers a wide range of standard furnaces and plants for many other thermal processing applications. The modular design of our products provides for customized solutions to your individual needs without expensive modifications.

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# Chamber Kilns



## Product Advantages Chamber Kilns



Multi-layer insulation with light-weight refractory bricks and energy-saving backing insulation adapted to the maximum kiln temperature



Only insulation materials that are not classified as carcinogenic according to TRGS 905, Class 1 or 2 are used



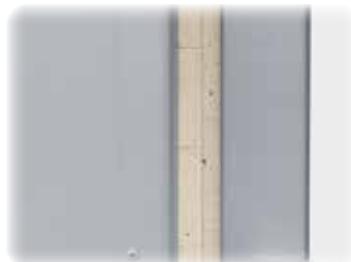
Durable light-weight refractory brick insulation inside the kiln ensures clean firing results



Dual-shell housing provides for low temperatures and optimal corrosion protection. Galvanized steel sheets on the sides



Rugged, self-supporting, vaulted arch construction



Door seal „brick on brick“, precisely ingrained by hand to ensure tight sealing



Ergonomic charging height with 800 mm base (chamber kiln N 50 E = 500 mm)



Solid state relays ensure low-noise heater operation



Protected door contact switch



Infinitely adjustable air inlet damper for optimal air supply during firing and reduced cooling times included in the scope of delivery for chamber kilns from 440 liters



Controller mounted on kiln door and removable for comfortable operation



Semi-automatic air inlet flap for residual drying in chamber kilns up to 300 liters. The flap closes automatically at a set temperature and does not have to be closed manually after the drying phase.



Exhaust air opening in the center back of the kiln roof ensures even extraction of the exhaust air in chamber kilns up to 300 liters



Motor-driven exhaust air flap in the middle of the kiln roof provides for optimal ventilation of the kiln for chamber kilns from 440 liters

## Chamber Kilns, Heated from Five Sides



Chamber kiln N 300

First-class craftsmanship, professional design, long service life and excellent temperature uniformity – chamber kilns from 100 liters up to 2200 liters round off the range of kilns for professionals. These kilns have proven their worth for many years, firing porcelain and stoneware and annealing glass, even when tightly stacked and at high working temperatures. You will find these chamber kilns in ceramic workshops, studios, clinics, schools and in private homes. They are recommended for frequent firing, when the kilns are tightly stacked and when excellent temperature uniformity is needed.

A kiln should not be operated permanently to its performance limits. If the kiln is often fired to its performance limits, we recommend our chamber kilns to 1340 °C. Most chamber kilns are available from stock.



Chamber kiln N 440



Ceramic studio of Anette Breu

### Standard design

- Heating elements on support tubes ensure free heat radiation
- Heating from five sides and a special arrangement of the heating elements ensure optimum temperature uniformity
- Scope of delivery includes SiC floor plates to protect the floor heating and provide for safe stacking of the kiln furniture
- Base included in scope of delivery
- Door cover made from structured stainless steel
- Semi-automatic air inlet flap that closes automatically after the drying phase in the firing program for chamber kilns up to 300 liters
- Motor-driven exhaust air flap in the middle of the kiln roof for optimum ventilation of the kiln with chamber kilns from 440 liters
- Defined application within the constraints of the operating instructions



Heating from five sides and a special arrangement of the the heating elements ensure optimal temperature uniformity

Model	Tmax °C	Inner dimensions in mm			Volume in l	Outer dimensions <sup>2</sup> in mm			Connected load kW	Electrical connection*	Weight in kg
		w	d	h		W	D	H <sup>1</sup>			
N 100	1300	400	530	460	100	720	1130	1440	9.0	3-phase	275
N 150	1300	450	530	590	150	770	1130	1570	11.0	3-phase	320
N 200	1300	470	530	780	200	790	1130	1760	15.0	3-phase	375
N 300	1300	550	700	780	300	870	1300	1760	20.0	3-phase	450
N 440	1300	600	750	1000	450	1000	1400	1830	30.0	3-phase	780
N 660	1300	600	1100	1000	650	1000	1750	1830	40.0	3-phase	950
N 1000	1300	800	1000	1250	1000	1390	1760	2000	57.0	3-phase	1800
N 1500	1300	900	1200	1400	1500	1490	1960	2150	75.0	3-phase	2500
N 2200	1300	1000	1400	1600	2200	1590	2160	2350	110.0	3-phase	3100
N 100/H	1340	400	530	460	100	760	1150	1440	11.0	3-phase	325
N 150/H	1340	430	530	620	150	790	1150	1600	15.0	3-phase	380
N 200/H	1340	500	530	720	200	860	1150	1700	20.0	3-phase	430
N 300/H	1340	550	700	780	300	910	1320	1760	27.0	3-phase	550
N 440/H	1340	600	750	1000	450	1000	1400	1830	40.0	3-phase	880
N 660/H	1340	600	1100	1000	650	1000	1750	1830	52.0	3-phase	1080
N 1000/H	1340	800	1000	1250	1000	1390	1760	2000	75.0	3-phase	2320
N 1500/H	1340	900	1200	1400	1500	1490	1960	2150	110.0	3-phase	2700
N 2200/H	1340	1000	1400	1600	2200	1590	2160	2350	140.0	3-phase	3600

<sup>1</sup>Base included

\*Please see page 40 for more information about supply voltage

<sup>2</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request



Semi-automatic air inlet flap for residual drying in chamber kilns up to 300 liters. The flap closes automatically at a set temperature and does not have to be closed manually after the drying phase.

## Chamber Kilns with Drawer Bottom or Bogie



Chamber kiln NW 300

The chamber kilns in the NW series combine the convincing quality benefits of the proven chamber kilns that are heated from five sides with a special feature. Charging these chamber kilns is much simpler, more ergonomic and also time-saving. With a drawer mechanism in the models up to 300 liters the floor can be easily pulled out. The larger models from 440 liters are designed as shuttle kilns with freely moving bogies. The optimal access in front of the kiln allows for simple and easy charging.

These models are especially suitable for ceramic workshops, studios, clinics and schools. Most kilns are available from stock, even larger models can be delivered within a short time.

The chamber kilns are available for maximum temperatures of 1300 °C or 1340 °C. If the kiln is often fired to its performance limits, we recommend our chamber kilns to 1340 °C.



Chamber kiln NW 440



**Standard design**

- Ergonomic loading from three sides
- Heating elements on support tubes ensure free heat radiation
- Heating from five sides and a special arrangement of the heating elements provide for optimal temperature uniformity
- Scope of delivery includes SiC floor plates to protect the floor heating and provide for safe stacking of the kiln furniture
- Door cover made from structured stainless steel
- Semi-automatic air inlet flap that closes automatically after the drying phase in the firing program for chamber kilns up to 300 liters
- Motor-driven exhaust air flap in the middle of the kiln roof for optimal ventilation of the kiln with chamber kilns from 440 liters
- Defined application within the constraints of the operating instructions



Model	Tmax °C	Inner dimensions in mm			Volume in	Outer dimensions <sup>1</sup> in mm			Connected load kW	Electrical connection*	Weight in kg
		w	d	h		W	D	H			
NW 150	1300	430	530	620	150	790	1150	1600	11.0	3-phase	400
NW 200	1300	500	530	720	200	860	1150	1700	15.0	3-phase	460
NW 300	1300	550	700	780	300	910	1320	1760	20.0	3-phase	560
NW 440	1300	600	750	1000	450	1000	1400	1830	30.0	3-phase	970
NW 660	1300	600	1100	1000	660	1000	1750	1830	40.0	3-phase	1180
NW 1000	1300	800	1000	1250	1000	1390	1760	2000	57.0	3-phase	1800
NW 150/H	1340	430	530	620	150	790	1150	1600	15.0	3-phase	520
NW 200/H	1340	500	530	720	200	860	1150	1700	20.0	3-phase	600
NW 300/H	1340	550	700	780	300	910	1320	1760	27.0	3-phase	730
NW 440/H	1340	600	750	1000	450	1000	1400	1830	40.0	3-phase	1260
NW 660/H	1340	600	1100	1000	660	1000	1750	1830	52.0	3-phase	1530
NW 1000/H	1340	800	1000	1250	1000	1390	1760	2000	75.0	3-phase	2320

Ergonomic loading from three sides

\*Please see page 40 for more information about supply voltage

<sup>1</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request

## Chamber Kilns, Heated from Three Sides



Chamber kiln N 280 E

Due to their good price-performance ratio, the Nabertherm chamber kilns heated from three sides are suitable for use in schools, kindergartens or occupational therapy. The heating elements are protected in grooves. For an intensive, professional use, we recommend our five-side heated chamber kilns.

The dual-shell, back-ventilated housing keeps the housing temperature low. A semi-automatic air inlet flap is included with standard scope of delivery. After the drying phase in the heating program, the flap closes automatically at a chosen temperature. No base flap has to be closed manually. The controller can be removed from the door bracket for convenient operation.



Chamber kiln N 140 E



Chamber kiln N 500 E

Standard design N 140 E - N 280 E

- Heating elements protected in grooves
- Heating from three sides (both sides and floor)
- Scope of delivery includes 3 ceramic supports and lower shelf to protect the bottom insulation and for safe stacking of the kiln furniture
- Base included in scope of delivery
- Defined application within the constraints of the operating instructions

Standard design N 500 E

- Freely radiating heating elements on support tubes
- Heating from three sides (both sides and floor)
- Scope of delivery includes SiC floor plate for even stacking of the kiln furniture
- Motor-driven exhaust air flap in the middle of the kiln roof for optimal ventilation of the kiln
- Defined application within the constraints of the operating instructions



Three-sided heating with heating elements protected in grooves (N 140 E - N 280 E)



Three-sided heating with heating elements on support tubes (N 500 E)

Model	Tmax °C	Inner dimensions in mm			Volume in l	Outer dimensions <sup>4</sup> in mm			Connected load kW	Electrical connection*	Weight in kg
		w	d	h		W	D	H <sup>1</sup>			
N 140 LE	1100	450 <sup>2</sup>	580	570 <sup>3</sup>	140	720	1130	1440	6.0	1-phase <sup>4</sup>	275
N 210 LE	1100	500 <sup>2</sup>	580	700 <sup>3</sup>	210	770	1130	1570	9.0	3-phase	320
N 280 LE	1100	520 <sup>2</sup>	580	890 <sup>3</sup>	280	790	1130	1760	9.0	3-phase	375
N 140 E	1300	450 <sup>2</sup>	580	570 <sup>3</sup>	140	720	1130	1440	9.0	3-phase	275
N 210 E	1300	500 <sup>2</sup>	580	700 <sup>3</sup>	210	770	1130	1570	11.0	3-phase	320
N 280 E	1300	520 <sup>2</sup>	580	890 <sup>3</sup>	280	790	1130	1760	15.0	3-phase	375
N 500 E	1300	600	820	1000	500	1000	1400	1830	30.0	3-phase	700

<sup>1</sup>Base included

<sup>3</sup>Collar height minus 110 mm

<sup>2</sup>Collar width minus 50 mm

\*Please see page 40 for more information about supply voltage

<sup>4</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request

## Chamber Kilns, Heated from Two Sides



Chamber kiln N 40 E as a tabletop model

Designed as chamber kilns with wide-opening door these models can be easily and clearly loaded. The appealing design and attractive price are convincing arguments for this kiln series. The heating elements are protected in grooves.

The kilns can be used for ceramics and glass or porcelain painting or also for simple fusing works. Most chamber kilns are available from stock. The infinitely adjustable air inlet opening in the door and the exhaust air opening in the roof ensure good ventilation inside the kiln and reduce cooling times.

Chamber kilns N 70 E with base as an accessory

### Standard design

- Heating elements protected in grooves
- Heating from both sides
- Designed as a tabletop model, base available as an accessory
- Infinitely adjustable fresh air inlet
- Scope of delivery includes an option for connecting an exhaust air pipe (80 mm diameter)
- Dual shell housing for low outer temperatures
- Defined application within the constraints of the operating instructions



Model	Tmax °C	Inner dimensions in mm			Volume in l	Outer dimensions <sup>3</sup> in mm			Connected load kW	Electrical connection*	Weight in kg
		w	d	h		W	D	H <sup>2</sup>			
N 40 E	1300	350	330	350	40	640	800	600	2.9	1phasig	90
N 40 E/R	1300	350	330	350	40	640	800	600	5.5	3-phase <sup>1</sup>	90
N 70 LE	1200	400	380	450	70	690	850	700	2.9	1phasig	120
N 70 E	1300	400	380	450	70	690	850	700	3.6	1phasig	120
N 70 E/R	1300	400	380	450	70	690	850	700	5.5	3-phase <sup>1</sup>	120
N 100 LE	1100	460	440	500	100	750	910	750	5.5	3-phase	150
N 100 E	1300	460	440	500	100	750	910	750	7.0	3-phase	150

<sup>1</sup>Heating only between two phases

<sup>2</sup>Height with base + 700 mm

<sup>3</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request

\*Please see page 40 for more information about supply voltage



## Standard Equipment Chamber Kilns

Function	N 40 E - N 100 E	N 140 E - N 280 E	N 500 E	N 100 - NW 300/H	N 440 - NW 1500/H
Catalog page	14	12 - 13	12 - 13	8 - 11	8 - 11
Multi-layer insulation with light-weight refractory bricks	●	●	●	●	●
No use of insulation materials that are classified as carcinogenic according to TRGS 905, Class 1 or 2	●	●	●	●	●
Rugged, self-supporting, vaulted arch construction	-	●	●	●	●
Door with durable seal, precisely ground by hand	●	●	●	●	●
Dual-shell housing, galvanized steel side panels	●	●	●	●	●
Protected door contact switch	●	●	●	●	●
Solid state relays ensure low-noise heater operation	●	●	●	●	●
Removable controller for comfortable operation	●	●	●	●	●
Air inlet flap closes automatically after residual drying	-	●	-	●	-
Infinitely adjustable fresh air flap	●	*	●	*	●
Scope of delivery includes an option for connecting an exhaust air pipe (80 mm diameter)	●	●	*	●	*
Motor-driven exhaust air flap	-	○	●	○	●
Five-sided heating on support tubes	-	-	-	●	●
Three-sided heating, protected in grooves	-	●	-	-	-
Three-sided heating on support tubes	-	●	●	-	-
Two-sided heating, protected in grooves	●	●	-	-	-
Scope of delivery includes 3 ceramic supports and shelf	-	●	-	-	-
Scope of delivery includes. SiC floor plate	-	-	●	●	●
Scope of delivery includes base	○	●	●	●	●
Door cover made from structured stainless steel	-	-	-	●	●

● Standard

○ Option

- Not available

\* Already motor-driven in the standard version



**Additional Equipment Chamber Kilns**



Manual zone control to optimize temperature uniformity



Motor-driven air inlet flap that can be opened and closed in relation to the program



Cooling fan for kilns up to 300 liters to reduce process times



Stainless steel exhaust hood



Motor-driven exhaust air flap



Door hinges on the left side



Base in special height



Base mounted on castors



Charging frame provides for ergonomic loading and unloading in front of the kiln



Kiln furniture



Observation hole in the kiln door (diameter 20 mm)



Second bogie for NW kilns from 440 liters



Door locking kit as set consisting of two door locks with two keys





# Top Loaders



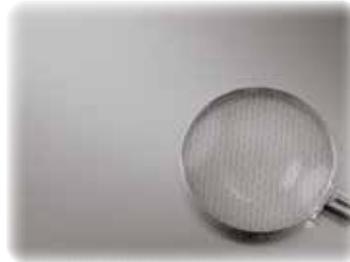
## Product Advantages Top Loaders



Three-layer insulation with high-quality, energy-saving backing insulation for low external temperatures and a good energy balance for kilns up to 60 liters



Two-layer insulation with durable light-weight refractory bricks and energy-saving backing insulation adapted to the maximum kiln temperature for kilns from 80 liters



Housing shell made from structured stainless steel



Only insulation materials that are not classified as carcinogenic according to TRGS 905, Class 1 or 2 are used



Durable lid seal (brick on brick)



Adjustable lid with quick-release lock and padlock



Solid state relays ensure low noise heater operation



Integrated gas-pressed springs for easy opening and closing of the lid



Easy to use controller for precise temperature control, removable for comfortable operation



Important data about power consumption and operating hours available via the information menu of the controller



Thermocouple protected in the insulation



Infinitely adjustable air inlet in opening in the kiln bottom for good ventilation and short cooling times



Connection for an exhaust air pipe (80 mm diameter)

## Top Loaders Round/Oval



Top loader Top 60

The attractive design, low weight, and convincing price-performance ratio are just a few of the advantages of our top loaders. These models always deliver very good firing results and are the right choice for hobby potters and workshops.

The particularly energy-saving refractory insulation and energy efficient backing insulation ensure that a maximum temperature of 1320 °C is reached with low electrical connected loads. The tabletop model Top 16/R is also suitable for testing glazes and firing samples.

For intensive professional use, we recommend our rectangular top loaders or chamber kilns with heating from five sides.



Top loader Top 220

### Standard design

- Heating elements protected in grooves, heating from all around
- Three-layer insulation with light-weight refractory bricks and high-quality, energy-saving backing insulation, up to 60 liters (two-layer insulation from Top 80)
- Thermocouple protected in the kiln wall
- Sturdy, locking castors for easy movement of the kiln
- Top 16/R available as a tabletop model without castors
- Defined application within the constraints of the operating instructions

Model	Tmax °C	Inner dimensions in mm			Volume in l	Outer dimensions <sup>2</sup> in mm			Connected load kW	Electrical connection*	Weight in kg
		w	d	h		W	D	H			
Top 16/R	1320	Ø 290		230	16	490	740	560	2.6	1-phase	32
Top 45/L	1320	Ø 410		340	45	600	890	730	2.9	1-phase	62
Top 45	1320	Ø 410		340	45	600	890	730	3.6	1-phase	62
Top 45/R	1320	Ø 410		340	45	600	890	730	5.5	3-phase <sup>1</sup>	62
Top 60/L	1200	Ø 410		460	60	600	890	850	2.9	1-phase	72
Top 60	1320	Ø 410		460	60	600	890	850	3.6	1-phase	72
Top 60/R	1320	Ø 410		460	60	600	890	850	5.5	3-phase <sup>1</sup>	72
Top 80	1320	Ø 480		460	80	660	960	860	5.5	3-phase <sup>1</sup>	100
Top 100	1320	Ø 480		570	100	660	960	970	7.0	3-phase	102
Top 130	1320	Ø 590		460	130	780	1080	880	9.0	3-phase	110
Top 140	1320	Ø 550		570	140	750	1040	990	9.0	3-phase	124
Top 160	1320	Ø 590		570	160	780	1080	990	9.0	3-phase	130
Top 190	1320	Ø 590		690	190	780	1080	1110	11.0	3-phase	146
Top 190/R	1320	Ø 590		690	190	780	1080	1110	13.5	3-phase	146
Top 220	1320	930	590	460	220	1120	1050	900	15.0	3-phase	150

<sup>1</sup>Heating only between two phases

<sup>\*</sup>Please see page 40 for more information about supply voltage

<sup>2</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request



Top loader Top 16/R as a tabletop model

## Additional Equipment Top Loaders



Raised base for Top 45 and Top 60



Robust castors



Wall bracket for the controller with 2.5 m connection cable



### Bottom heating and manual zone control from 80 liters:

Does your work need a very precise temperature uniformity? In this case we recommend the optional bottom heating for our top loaders from 80 liters. With our controllers, you can control the bottom heating as a second zone. Set your firing curve on the controller as usual. If you find that the temperature uniformity has to be changed from top to bottom, you simply adjust the ratio.



## Top Loaders Rectangular



Top loader HO 70/R



Top loader HO 100/R

The rectangular top loaders from Nabertherm combine the benefits of a top loader with the sturdy design of a chamber kiln and are very good suited for professional use. The freely radiating heating elements always ensure perfect firing results. These models are ideal for working temperatures between 900 °C and 1230 °C. The infinitely adjustable fresh air opening in the bottom and the exhaust air opening on the side ensure good ventilation inside the kiln and allow the kiln to cool faster. Castors ensure easy movement of the kiln.

### Standard design

- Heating elements on support tubes ensure free heat radiation
- Heating from both sides
- Castors
- Sturdy design
- Two-layer refractory insulation and energy saving backing insulation
- Defined application within the constraints of the operating instructions



Heating elements on support tubes ensure uninterrupted heat radiation

Model	Tmax °C	Inner dimensions in mm			Volume in l	Outer dimensions <sup>2</sup> in mm			Connected load kW	Electrical connection*	Weight in kg
		w	d	h		W	D	H			
HO 70/L	1200	440	380	420	70	1025	830	830	3.6	1-phase	145
HO 70/R	1320	440	380	420	70	1025	830	830	5.5	3-phase <sup>1</sup>	145
HO 100	1320	430	480	490	100	1015	930	900	8.0	3-phase	160

<sup>1</sup>Heating only between two phases

\*Please see page 40 for more information about supply voltage

<sup>2</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request







## Gas-Fired Kilns



# RAKU Kilns



Architect Mr. Luz



RAKU kiln 100 with gas burner and lifting stand with crank drive



Top hat including table



Propane burner with bottle connection, high-performance with 18 kW



Temperature gauge for RAKU kiln 100, easy to operate, NiCr-Ni temperature sensor, display range 20 °C - 1200 °C, optional connection of second sensor with display changeover

The RAKU kiln 100 is a gas-fired kiln for outdoor operations with standard propane gas. This kiln combines two different kiln concepts: It can either be used as a top loader or as top hat kiln. In the basic version, the top hat is lifted by two bars. As an accessory, the kiln can be supplied with a lifting stand. This frame is provided with a crank drive which makes it very easy to lift the top hat. With this version, you can operate the kiln by yourself, without problems. We can also provide the matching propane burner. However, you may decide to use your own model.

- Can be used as top hat kiln or top loader
- Easy and simple construction, applies particularly to the top hat
- High-quality insulation with low heat-storage capacity for short heat-up times
- Housing made of textured stainless steel
- Inspection holes for observing your fired ware
- Special flame manipulation for good temperature uniformity
- Defined application within the constraints of the operating instructions

Model	Tmax °C	Inner dimensions in mm			Volume in l	Outer dimensions <sup>1</sup> in mm			Weight in kg	
		w	d	h		W	D	H	Top hat	Lifting device
RAKU kiln 100 lifting stand burner	1150	500	500	620	103	750	660	1150	36	16
		Power 18 kW				750	1000	1850		

<sup>1</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request

## Gas-Fired Chamber Kilns

Some firing processes or connecting conditions require a gas-fired chamber kiln. Fast heating times and very good firing results are strong reasons for using such equipment.

Equipped with powerful gas burners the chamber kilns NB 150 - NB 600 are suitable for creative applications. An automatic temperature regulation is included in the basic model. The controller starts controlling after the burner has been manually ignited by automatic switching the burner between high and low loads. The burners have been optimized to allow relatively precise control from 300 °C. Despite this, we still recommend drying the charge completely to avoid waste caused by rapid heating up in the lower temperature range. At the end of the program, the burners are automatically shut off.

- Powerful, atmospheric burners for operation with natural gas (min 9.9 kWh/m<sup>3</sup>) or propane gas.  
 Required flow pressure under full load min. 45 mbar
- Depending on the application, special positioning of the gas burners with flame guidance provides for optimal temperature uniformity
- Manual set-up of burner power and atmosphere (oxidizing or reducing)
- Gas fittings with flame control and safety valve in accordance with DVGW (German Technical and Scientific Association for Gas and Water)
- Multi-layer, reduction-proof insulation with light-weight refractory bricks and high-quality back-up insulation result in low gas consumption
- Self-supporting and rugged ceiling, bricks laid in arched construction. Only fiber materials are used which are not classified as carcinogenic according to TRGS 905, class 1 or 2.
- Environment-friendly, long-life powder-coating of housing
- Dual shell housing
- Dual shell door with long-live sealing
- Door is adjustable
- Exhaust hood
- Base included in scope of delivery
- Comfortable charging height with base of 760 mm (NB 150, NB 300) and 600 mm (NB 400, NB 600)
- Defined application within the constraints of the operating instructions



Chamber kiln NB 400 with base frame



Gas lines and thermocouple at the chamber kiln



Powerful burner



Automated process control

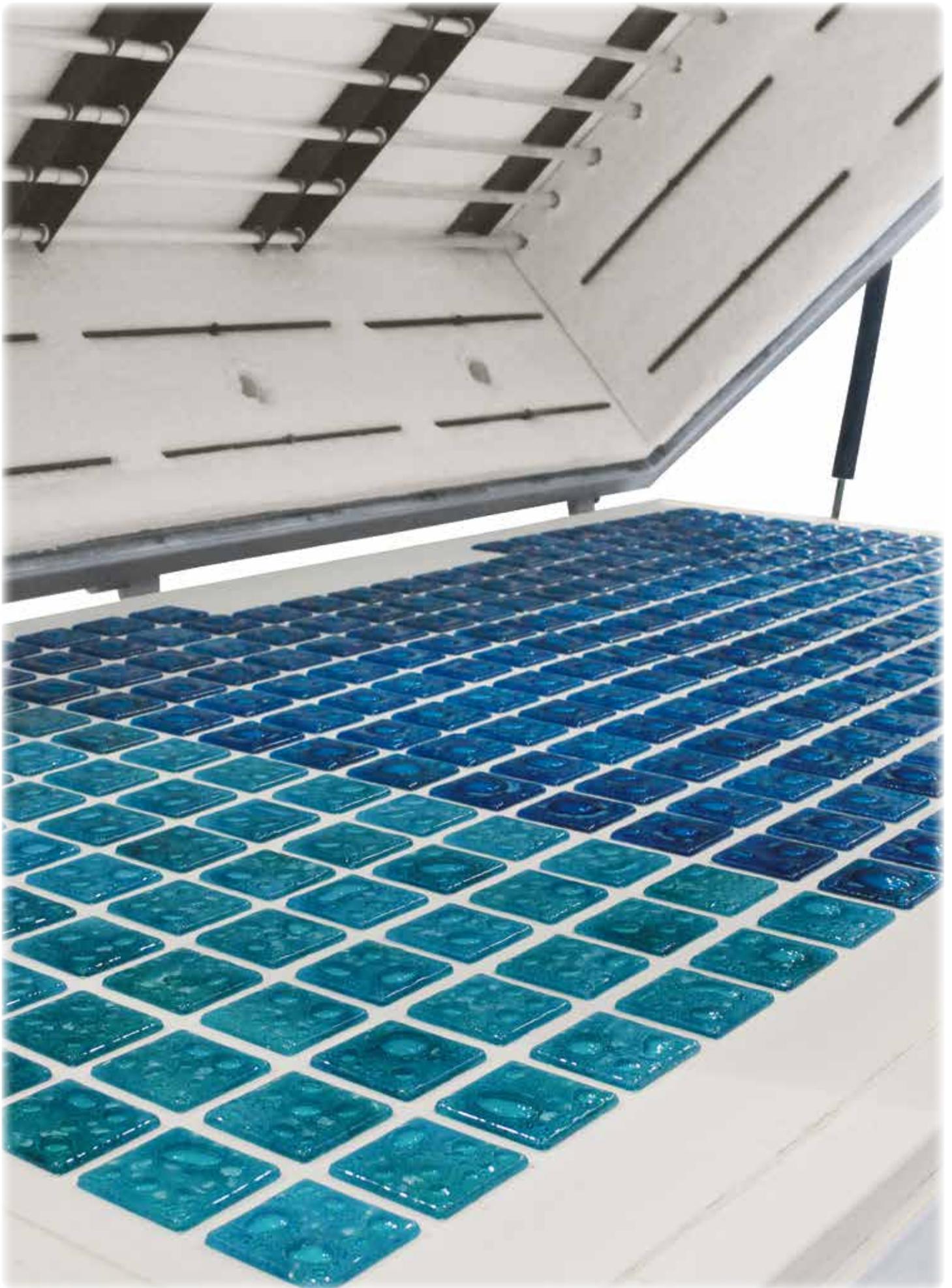
Model	Tmax °C	Work space dimensions in mm			Volume in l	Outer dimensions <sup>3</sup> in mm			Rating kW	Electrical connection*1	Weight in kg
		w	d	h		W	D	H <sup>2</sup>			
NB 150	1300	330	530	470	150	1200	1400	2050	30	1-phase	450
NB 300	1300	450	700	630	300	1315	1570	2200	40	1-phase	740
NB 400	1300	540	750	850	440	1410	1600	2350	80	1-phase	980
NB 600	1300	540	1100	850	650	1410	1950	2350	80	1-phase	1150

<sup>1</sup>No voltage supply necessary if kiln is manually operated

<sup>\*</sup>Please see page 40 for more information about supply voltage

<sup>2</sup>Exhaust hood of 470 mm (NB 150, NB 300) or 500 mm (NB 400, NB 600) included (dismountable)

<sup>3</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request





# Fusing Furnaces



## Product Advantages Fusing Furnaces



Closely arranged roof heating elements protected in quartz glass tubes for direct, even heating of the glass



Level table surface with rugged refractory insulation and marked charge surface



Only insulation materials that are not classified as carcinogenic according to TRGS 905, Class 1 or 2 are used



Appealing, dual-shell stainless steel housing



Large handles on the right and left sides of the lid (GF 600 in the middle)



Gas pressure springs for easy opening and closing of the lid



Adjustable, large quick-release fasteners – also suitable when working with gloves



Closable opening for ventilation, for faster cooling and to observe the charge



Rugged base on castors with surface for glass and tools



Ergonomic charging height of 860 mm



Solid state relays ensure low-noise heater operation



Heating switches off when the lid is opened

## Fusing Furnaces with Movable Table



GFM 1425 fusing furnace with motor-driven lid opening

Fusing furnaces in the "GFM" series were developed for special production requirements. The GFM series combines the impressive quality benefits of the GF series with the option of charging the table outside the furnace. The table runs on swivel castors and can thus be moved freely.

The scope of delivery includes a flat table for fusing work; additional tables can be added. An interchangeable table system on rails is especially economical, as one table can be charged while the other is in the furnace. Instead of flat tables, different tables with different heights can be used if the furnace is to be used for higher components, for example.

### Standard design

- Heated lid with fixed frame
- Base included in scope of delivery
- Defined application within the constraints of the operating instructions



Movable table on swivel castors

Model	Tmax °C	Inner dimensions in mm			Floor space in m <sup>2</sup>	Outer dimensions <sup>1</sup> in mm			Connected load kW	Electrical connection*	Weight in kg
		w	d	h		W	D	H			
GFM 420	950	1660	950	400	1.57	2170	1340	1400	18	3-phase	630
GFM 520	950	1210	1160	400	1.40	1720	1550	1400	15	3-phase	660
GFM 600	950	2010	1010	400	2.03	2530	1400	1400	22	3-phase	730
GFM 920	950	2110	1160	400	2.44	2630	1550	1400	26	3-phase	980
GFM 1050	950	2310	1210	400	2.79	2830	1600	1400	32	3-phase	1190
GFM 1425	950	2510	1510	400	3.79	3030	1900	1400	32	3-phase	1390

\*Please see page 40 for more information about supply voltage

<sup>1</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request



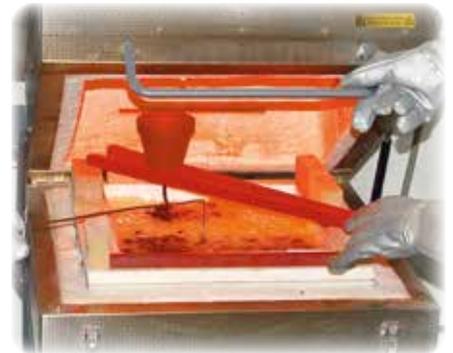
Glass fusing workpieces from a fusing furnace (Jo Downs Glass Design Ltd.)

## Fusing Furnaces with Fixed Table



GF 240 fusing furnace

The fusing furnaces in the GF 75 - GF 1425 series are designed for professionals. Closely arranged heating elements protected in quartz glass tubes ensure very good temperature accuracy during fusing or bending on the complete area of the table. All models have an appealing, dual-shell stainless steel housing. The level table surface made from rugged, durable refractory material and the lid opening with gas pressure springs as support simplify charging of the furnace. The optimized electrical connected load ensures that the glass heats up quickly.



GF 75 fusing furnace



GF 920 fusing furnace

### Standard design

- Heating elements protected in quartz glass tubes
- Controller integrated on the right side of the furnace to save space
- C440 controller included in scope of delivery
- Defined application within the constraints of the operating instructions



Closely arranged roof heating elements protected in quartz glass tubes for direct, even heating of the glass

Model	Tmax °C	Inner dimensions in mm			Floor space in m <sup>2</sup>	Outer dimensions <sup>4</sup> in mm			Connected load kW	Electrical connection*	Weight in kg
		w	d	h		W	D	H <sup>3</sup>			
GF 75	900	620	620	310	0.38	1100	965	1310	3.6	1-phase <sup>1</sup>	180
GF 75 R	950	620	620	310	0.38	1100	965	1310	5.5	3-phase <sup>1</sup>	180
GF 190 LE	950	1010	620	400	0.62	1480	965	1400	6.0	1-phase <sup>2</sup>	210
GF 190	950	1010	620	400	0.62	1480	965	1400	6.4	3-phase <sup>1</sup>	210
GF 240	950	1010	810	400	0.81	1480	1155	1400	11.0	3-phase	275
GF 380	950	1210	1100	400	1.33	1680	1465	1400	15.0	3-phase	450
GF 420	950	1660	950	400	1.57	2130	1315	1400	18.0	3-phase	500
GF 520	950	1210	1160	400	1.40	1680	1525	1400	15.0	3-phase	550
GF 600	950	2010	1010	400	2.03	2480	1375	1400	22.0	3-phase	600
GF 920	950	2110	1160	400	2.44	2580	1525	1400	26.0	3-phase	850
GF 1050	950	2310	1210	400	2.79	2780	1575	1400	32.0	3-phase	1050
GF 1425	950	2510	1510	400	3.79	2880	1875	1400	32.0	3-phase	1250

<sup>1</sup>Heating only between two phases

<sup>\*</sup>Please see page 40 for more information about supply voltage

<sup>2</sup>Fusing of 32 A if connected to 230 V

<sup>3</sup>Including base

<sup>4</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request

## Additional Equipment Fusing Furnaces



Observation window in air inlets to observe the glass.



Floor heating provides for even heating of larger objects



Motor-driven lid opening



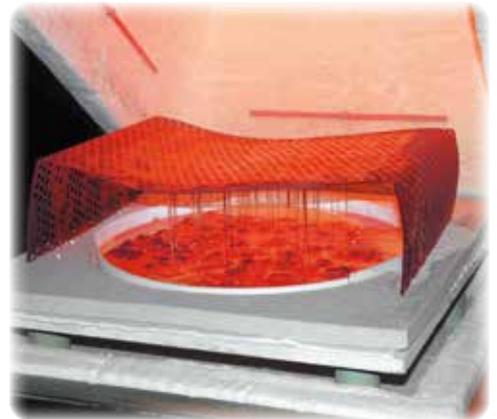
Motor-driven exhaust air flap for fast cooling after firing



Additional tables to extend the furnace system for GFM models; interchangeable table system to utilize residual heat and reduce cycle times by changing tables while the furnace is still warm.



Cooling fan for faster cooling with the lid closed



## Top Loader as Fusing Furnaces



Fusing furnace F 30



Fusing furnace F 75

This kiln range is the ideal choice for many fusing applications. The insulation is made from lightweight refractory bricks with protected heating elements in the lid, fusing furnaces F 75 and F 220 have additional side heating.

- Housing made of textured stainless steel
- Controller mounted on the right side of the kiln with removable holder for comfortable operation
- Insulation made of lightweight refractory bricks for clean firing results
- Lid with adjustable quick-release lock and padlock hasp
- Adjustable lid mechanism
- Long-life lid seal (brick on brick)
- Lid interlock safety switch
- Heating elements in the lid, fusing furnaces F 75 and F 220 have additional side heating
- Solid state relays provide for low-noise operation
- Powerful gas springs support lid opening
- Lockable castors for easy transport of kiln without the need for lifting
- Top loader F 30 as tabletop model without castors
- Manual-Zone-Regulation for F 220 (lid and sides)
- Defined application within the constraints of the operating instructions

### Additional equipment

- Higher chassis



Kiln interior with circular lower side heating



Front made of textured stainless steel

Model	Tmax °C	Inner dimensions in mm			Floor space in m <sup>2</sup>	Outer dimensions <sup>2</sup> in mm			Connected load kW	Electrical connection*	Weight in kg
		w	d	h		W	D	H			
F 30	950	Ø 410			0.13	650	800	500	2.0	1-phase	50
F 75 L	950	750	520	230	0.33	950	880	680	3.6	1-phase	80
F 75	950	750	520	230	0.33	950	880	680	5.5	3-phase	80
F 110 LE	950	930	590	230	0.47	1120	950	680	6.0	1-phase <sup>1</sup>	95
F 110	950	930	590	230	0.47	1120	950	680	7.5	3-phase	115
F 220	950	930	590	460	0.47	1120	950	910	15.0	3-phase	175

<sup>1</sup>Fusing of 32 A if connected to 230 V

\*Please see page 40 for more information about supply voltage

<sup>2</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request



Fusing furnace F 110

## Glass Beads Cooling Furnace



Glass beads cooling furnace MF 5

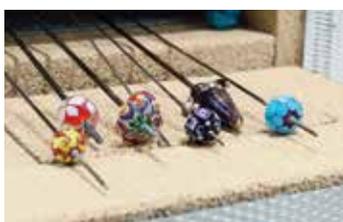


A high-quality furnace is indispensable for professional glass bead tempering. The MF 5 model is the ideal furnace for cooling large glass beads or glass jewelry. For charging the glass beads, the door is equipped with a window which can be closed with a filler piece when the furnace is used for other applications. The infrared heating prevents direct contact with the heating elements so the glass beads cooling furnace can be safely opened during operation without heating interruption.

With a maximum temperature of 950 °C, this furnace is multifunctional, and can be used for fusing and enameling applications, for decorating and for preheating frits and other materials.



Front made of textured stainless steel



- Table-top model
- Heating from furnace ceiling, elements protected in quartz glass tubes for safe open-door operation
- Multi-layer energy-efficient insulation
- Only insulation materials that are not classified as carcinogenic according to TRGS 905, Class 1 or 2 are used
- Housing made of textured stainless steel
- Solid state relays provide for low-noise operation
- Window with rack for charging glass beads
- Defined application within the constraints of the operating instructions

Model	Tmax °C	Inner dimensions in mm			Volume in l	Outer dimensions in mm			Connected load kW	Electrical connection*	Weight in kg
		w	d	h		W	D	H			
MF 5	950	220	240	100	5	485	370	320	1.6	1-phase	15

\*Please see page 40 for more information about supply voltage

## Installation and Exhaust Air Extraction

### Installation

When the kiln is being installed, it is important that there is a safety gap of 0.5 m between the kiln and flammable materials on all sides and 1.0 m to the ceiling. If the ceiling is lower, heat-resistant insulation must be installed. If non-flammable materials are used for insulation the minimum distance between the kiln may be reduced to 0.20 m at the sides. The kiln must be placed on a non-flammable surface (fire safety class A DIN 4102 – Example: concrete, tiles, glass, aluminum or steel). The floor must be level so that the kiln can stand upright. Kiln and switchgear are not designed to be used outdoors.

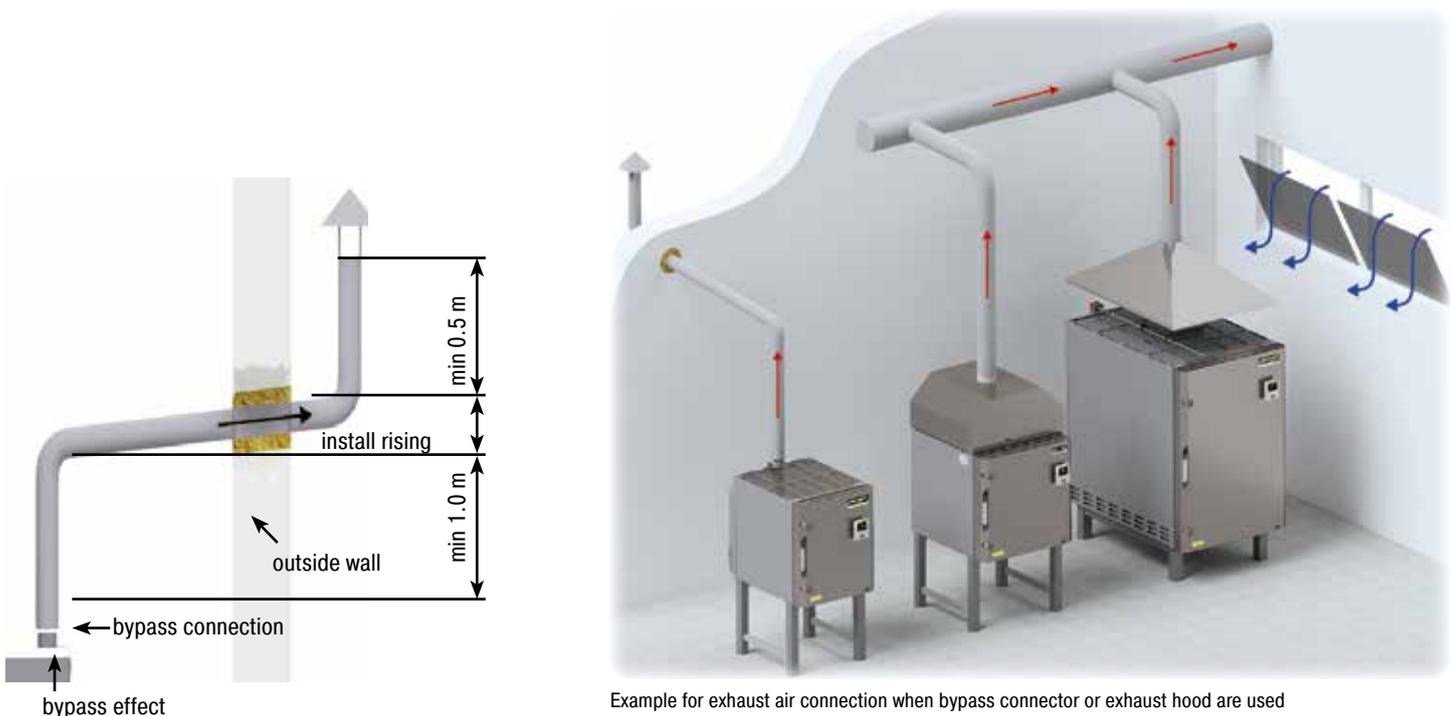


### Exhaust Air Extraction

When ceramics are fired, depending on the quality of the clay and/or glaze, they can emit gases and vapors that are harmful to health. Therefore, exhaust gases must be directed outdoors in a suitable manner. We recommend the connection of an extraction pipe to the kiln to remove the exhaust gases.

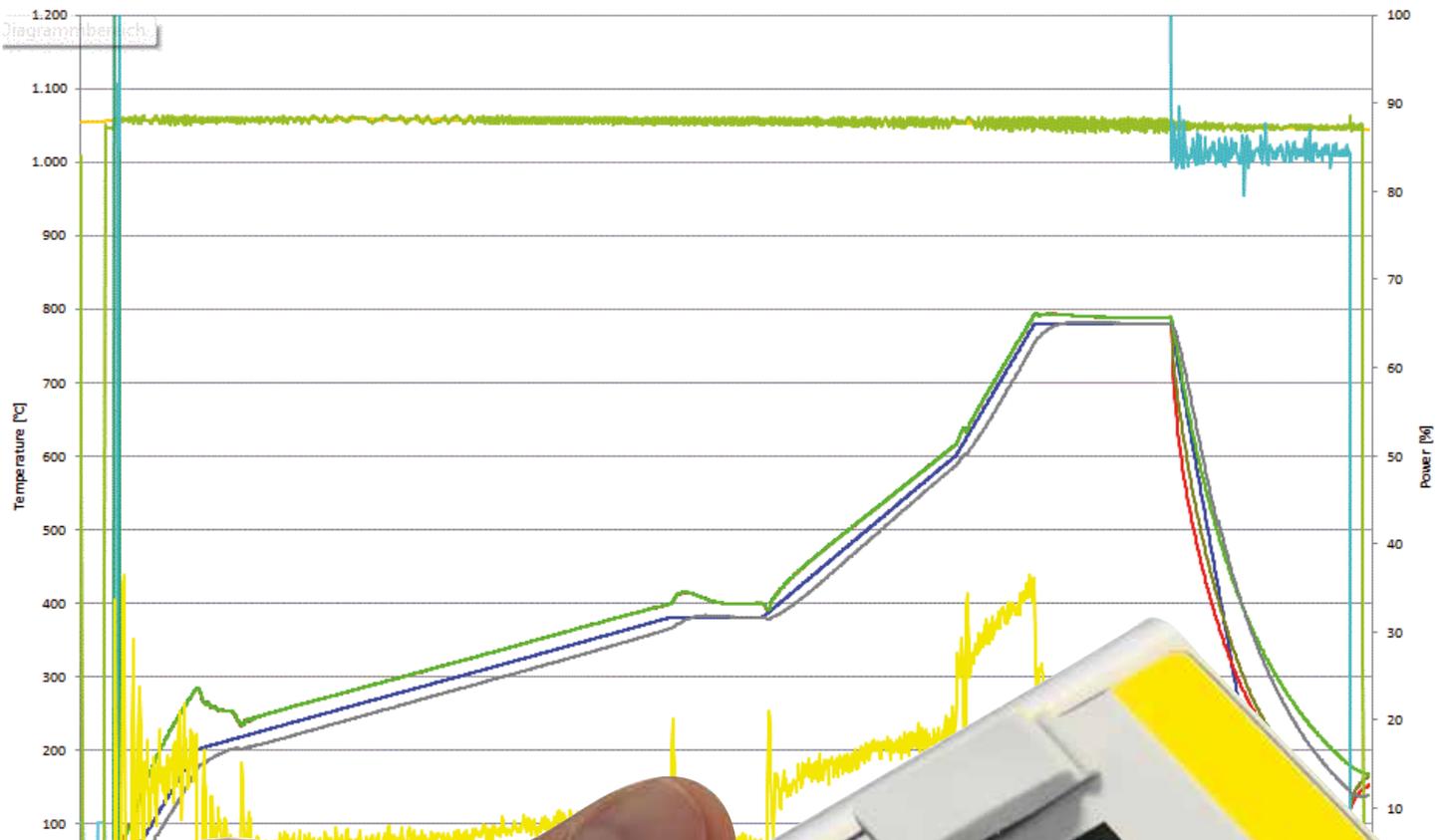
An 80 mm diameter zinc-plated steel pipe or stainless steel pipe is suitable for this purpose (up to model N 300/H). The pipe must be installed constantly rising. Sufficient room ventilation is necessary to ensure that fresh air is mixed with the exhaust gases.

A maximum exhaust gas temperature of approx. 200 °C can be assumed for the piping system. There is a risk of burning at the bypass connection and the piping. The wall duct must be made from heatproof material. We recommend that a local ventilation company dimensions the exhaust gas piping.



Example for exhaust air connection when bypass connector or exhaust hood are used

[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"/>				
2	1.300	900	00:10		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
3	900	900	INFINITE		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
4	END				<input checked="" type="checkbox"/>	<input checked="" 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	F 30 - F 110	F 220	MF 5
Catalog page	8-9	10-11	12-13	14	21	23	27	31	32-33	35	35	36
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

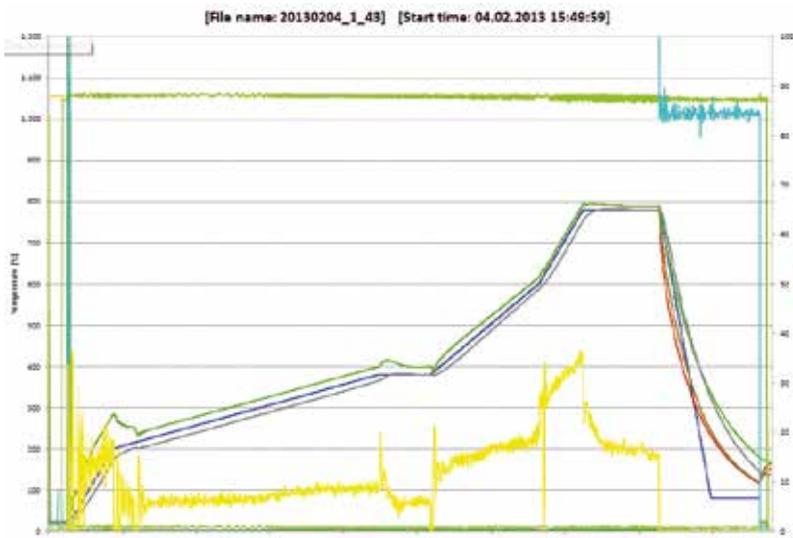
## Processdocumentation

### 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.



### Visualization with NTGraph for Single-Zone Controlled Furnaces

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

Segment Nr	Start temp °C	End temp °C	Time h:mm	Rate %/h	Heiz 1	Heiz 2	Heiz 3	Heiz 4	Heiz 5	Heiz 6	Heiz 7	Heiz 8	Heiz 9	Heiz 10	Cooling
1	0	1,300		100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>								
2	1,300	900	00:10		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>								
3	900	900	INFINITE		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>								
4	END				<input checked="" type="checkbox"/>	<input checked="" 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"/>	<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"/>	<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"/>	<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"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Software NTEdit for Entering Programs on the PC

By using the software NTEdit (Freeware) the input of the programs becomes clearer and thus easier. The program can be entered on customers PC and then be imported into the controller with a USB stick. The display of the set curve 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).

**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 at a PC. 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

## The whole World of Nabertherm: [www.nabertherm.com](http://www.nabertherm.com)

Please visit our website

[www.nabertherm.com](http://www.nabertherm.com) and find out all you want to know about us - and especially about our products.

Besides news and our current calendar of trade fairs, there is also the opportunity to get in touch directly with your local sales office or nearest dealer worldwide.

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- Foundry



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**All other Countries: Follow**  
<http://www.nabertherm.com/contacts>



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