CATALOG

Laboratory furnaces and dryers

LAC® Art of heating

IN LABORATORY SEGMENT

LAC COMPANY PRODUCES

MORE THAN 300 FURNACES PER YEAR

Art of heating

The LAC company profile

LAC Company Ltd. has been a successful manufacturer and marketer of industrial furnaces, dryers and refractory castable shapes for more than two decades and has a strong presence in both in domestic as well as foreign markets. Since its establishment in 1992, the company has manufactured more than 11,000 furnaces.

The products are designed for applications in a wide range of heat treatment and technological processes and are particularly suited to the following:

- Heat treatment of ferrous and non-ferrous metals in metallurgy
- Heat treatment and chemical heat treatment metal processing
- Heat treatment for metal-shaping and welding processes
- Low-temperature applications
- Alloy technologies for non-ferrous metals
- Laboratory technologies
- Industrial production of glass and industrial ceramics
- Production of hobby glass and ceramics

The LAC manufacturing program includes the manufacture of a complete standard range of furnace and dryer lines, and also accommodates the individual requirements of the customer through the design and manufacture of atypical furnaces tailor-made to meet customer specifications. In response to ever-increasing global energy prices, LAC has begun to actively implement energy audits through which energy losses are identified, thus helping customers to significantly reduce energy costs. The LAC development and design office works in tandem with a team of service technicians to ensure quality service to customers and pave the way for future company growth. LAC technological development has also progressed to include the fulfilment of NADCAP standard contracts for the aircraft and defence industries.

A significant part of the LAC business is the manufacture of refractory castable shapes, the bulk of which are used in the manufacture of industrial furnaces. Refractory castable shapes are also used by metallurgy companies and manufacturers of boilers for burning wood, pellets, and biomass. LAC is presently one of the largest manufacturers of refractory concrete shaped blocks in Europe. In 2012 LAC completed a 1,2 mil. € expansion of the LAC refractory castable shapes production facilities. The company also supplies heating elements, refractory and insulation materials, regulating elements, and reconstruction of furnaces, heating systems and switchboards to its customers.

The rapid growth of the company is illustrated by its present 200 employees, capital assets of 480,000 €, and 25,000 m^2 of production, warehousing and company administration facilities. In 2012 the company re-certified its quality management system to meet the new standard CSN EN ISO 9001:2009. In 2008 LAC opened a sales branch in China.

LONG LIFETIME – 24 MONTHS WARRANTY

PERFECT WORKSHOP PROCESSING

LOW POWER CONSUMPTION

SAFE OPERATION

DEVELOPED, DESIGNED
AND MANUFACTURED IN CZECH REPUBLIC

MAINTENANCE SERVICES

SUMMARY

I. CHAMBER FURNACES

1. Laboratory furnaces L ..... pg. 06

2. Laboratory furnaces LE ..... pg. 08

3. Laboratory furnaces LH ..... pg. 10

II. MUFFLE FURNACES

4. Laboratory muffle furnaces LMH ..... pg. 12

5. Vertical laboratory muffle furnaces LMV ..... pg. 14

III. SPECIAL FURNACES

6. Laboratory tube furnaces LT ..... pg. 16

7. High-temperature furnaces VP ..... pg. 18

8. Laboratory gradient furnaces SP ..... pg. 20

IV. CHAMBER FURNACES

9. Hardening chamber furnaces PKE ..... pg. 22

V. FURNACES AND DRYERS WITH INTERNAL AIR CIRCULATION

10. Tempering chamber furnaces PP ..... pg. 24

11. Dryers S ..... pg. 26

VI. FURNACES WITH GASTIGHT RETORT

12. Gastight hardening chamber furnaces with retort PKR ..... pg. 28

13. Gastight hardening chamber furnaces with retort and internal atmosphere circulation PKRC ..... pg. 30

VII. HARDENING WORKPLACE

14. Hardening laboratory table SKM ..... pg. 33

VIII. ATYPICAL FURNACES

15. Furnace for mechanical testing materials at increased temperature LT 90/300/11 ..... pg. 34

16. Small workplace CHTZ ..... pg. 35

17. Laboratory calcining furnace LH 30/12 ..... pg. 36

18. Laboratory dispersing unit LD 05 ..... pg. 38

19. Induction melting furnace I ..... pg. 39

IX. MEASUREMENT AND CONTROL ..... pg. 40

X. DESCRIPTION OF ACCESSORIES ..... pg. 42

These furnaces are suitable for all types of laboratory tests in medical, dental, hygienic, industry, ceramic, glassmaking, and other workplaces. They are suitable for technological testing where a very precise temperature distribution and a dynamic progress of the temperature curve are required. For control of cooling, it is possible to separate heat elements in the internal space of the furnace. It is especially suitable for material heat treatments, all sorts of fritting tests, calcinations, softening or material sintering point setting, samples firing etc. The rust-resistant mantle ensures a long service life of the furnace. The heating elements are placed in the ceramic heating boards. The heating coils are thus partially protected against corrosion by aggressive materials which can be released during use.

Standard design of furnace includes:

- Ht40 AL or Ht INDUSTRY controller
- Manually operated door opening downwards with an end switch
- Insulation from the mineral fibre insulation boards
- Heating panels from the refractory ceramics in the bottom and in the ceiling
- Ventilation chimney on the back part of the furnace
- Supply cable fitted with single-phase plug
- Thermocouple Type "S"
- Solid state relay - SSR

Optional accessories for extra charge:

- Injector with an exhaust fan and draft diverter (only with Ht INDUSTRY controller)
- Plate for furnace bottom
- Protective atmosphere inlet
- Calibration of the controller measuring entry
- Interface RS232 or EIA485
- Set HtMonit (includes interface + software)

Furnace type	Controller	Tmax	Volume	External dimensions	Internal dimensions	Input	Weight	Voltage	Furnace protection	Max. carrying capacity of bottom
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	kg	V	A	kg
L 03/12	Ht40 AL	1200	3	380x440x400	180x100x140	1,2	21	230	16/1	4
L 05/12	Ht40 AL	1200	5	430x470x430	230x130x170	2,4	26	230	16/1	6
L 09/12	Ht40 AL	1200	9	430x505x500	230x170x240	3	32	230	16/1	6
L 15/12	Ht40 AL	1200	15	450x505x600	250x170x340	3,5	39	230	16/1	6
L 03/12	Ht INDUSTRY	1200	3	380x440x400	180x100x140	1,2	21	230	16/1	4
L 05/12	Ht INDUSTRY	1200	5	430x470x430	230x130x170	2,4	26	230	16/1	6
L 09/12	Ht INDUSTRY	1200	9	430x505x500	230x170x240	3	32	230	16/1	6
L 15/12	Ht INDUSTRY	1200	15	450x505x600	250x170x340	3,5	39	230	16/1	6

Technical changes reserved

Furnaces LE are suitable for testing technology where the exact distribution of temperature, the controlled increase and decrease of temperature, and controlled cooling are important, and where it is also desirable that the heating elements are not in the interior space with the samples. This especially applies to heating material for the heat treatment of metal, various tests of sintering, calcination, determination of the softening point or of material sintering, combusting samples, enamel firing etc. The rust-resistant coating ensures the long life of the furnace. The heating spirals are placed in tubes of silica glass. This partially protects the spirals from corrosion by aggressive materials which can be released during use. A programmable controller and the master switch are located on the front side of the furnace.

Standard design of furnace includes:

- Ht60B controller
- Manually operated door opening downwards with an end switch
- Heating elements in quartz glass tubes
- Ventilation chimney on the back part of the furnace
- Slider for air supply control
- Supply cable fitted with single-phase plug
- Thermocouple Type "K"
- Solid state relay - SSR

Optional accessories for extra charge:

- Ht40 P controller
- Injector with an exhaust fan and draft diverter (only with Ht40 P controller)
- Protective atmosphere inlet
- Calibration of the measuring system
- Interface RS232 or EIA485
- Set HtMonit (includes interface + software)

Furnace type	Controller	Tmax	Volume	External dimensions	Internal dimensions	Input	Weight	Voltage	Furnace protection	Max. carrying capacity of bottom
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	kg	V	A	kg
LE 05/11	Ht60B	1100	5	470x330x455	170x130x230	1,8	18	230	16/1	6
LE 09/11	Ht60B	1100	9,4	490x370x515	190x170x290	2,3	23	230	16/1	6
LE 15/11	Ht60B	1100	14,4	550x370x565	250x170x340	3	30	230	16/1	6
LE 05/11	Ht40 P	1100	5	470x330x455	170x130x230	1,8	18	230	16/1	6
LE 09/11	Ht40 P	1100	9,4	490x370x515	190x170x290	2,3	23	230	16/1	6
LE 15/11	Ht40 P	1100	14,4	550x370x565	250x170x340	3	30	230	16/1	6

Technical changes reserved

These furnaces have a flexible use in laboratories. Suitable for the testing of different materials using heat processing, requiring higher operating temperatures above 1300°C where no harmful materials which can attack the coils or brick lining can be produced during use. It can be used for heat treatment of metals, glass or ceramics in smaller quantities. Rust-resistant construction, an attractive design, perfect display of the temperature, premier insulating materials, programmable temperature adjustment with high accuracy, a solid state relay (more fluent and quieter, the minimum disturbance of the surrounding mechanism), perfect workshop processing, the hardware and top operating safety. Working temperature is up to 1340°C.

Standard design of furnace includes:

- Ht40 AL controller
- Manually operated door opening upwards with an end switch
- Heating coils inserted in the lining grooves
- Ventilation chimney on the back part of the furnace
- Chamber composed of lightweight bricks
- Supply cable fitted with single-phase plug
- Thermocouple Type "S"
- Solid state relay - SSR

Optional accessories for extra charge:

- Ht INDUSTRY controller
- Injector with an exhaust fan and draft diverter (only with Ht INDUSTRY controller)
- Protective atmosphere inlet
- Calibration of the measuring system
- Interface RS232 or EIA485
- Set HtMonit (includes interface + software)

Furnace type	Controller	Tmax	Volume	External dimensions	Internal dimensions	Input	Weight	Voltage	Furnace protection	Max. carrying capacity of bottom
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	kg	V	A	kg
LH 06/13	Ht40 AL	1340	6	600x590x715	200x150x230	1,5	72	230	16/1	10
LH 09/13	Ht40 AL	1340	9	600x590x715	230x170x230	2	73	230	16/1	10
LH 15/13	Ht40 AL	1340	15	620x670x715	250x250x250	2,4	82	230	16/1	15
LH 30/13	Ht40 AL	1340	30	680x770x800	310x310x310	3,2	120	230	16/1	25
LH 06/13	Ht INDUSTRY	1340	6	600x590x715	200x150x230	1,5	72	230	16/1	10
LH 09/13	Ht INDUSTRY	1340	9	600x590x715	230x170x230	2	73	230	16/1	10
LH 15/13	Ht INDUSTRY	1340	15	620x670x715	250x250x250	2,4	82	230	16/1	15
LH 30/13	Ht INDUSTRY	1340	30	680x770x800	310x310x310	3,2	120	230	16/1	25

Technical changes reserved

Furnaces are used in laboratories for the heat-treatment testing of various samples, where aggressive fouling can occur. Rust-resistant construction, an attractive design, a draft prevents the evaporation of vapors at firing and markedly decreasing the temperature of the mantle, a perfect display of the temperature, top insulating materials (low power consumption, with the possibility of a fast start with the required temperature). Furnaces have programmable temperature adjustment with a high accuracy, a solid state relay for more fluent and quieter operation, with minimum disturbance of the surrounding mechanism. They also have a perfect workshop processing, the hardware, and top operating safety.

Standard design of furnace includes:

- Ht40 AL controller
- Manually operated door opening upwards with an end switch
- The door portal made of refractory shapes
- Inside of the peephole is protective clear glass
- Muffle insulated with the matting of the mineral grain and encased in the insulation desks
- Heating spiral on the muffle
- Ventilation chimney on the back part of the furnace
- Supply cable fitted with single-phase plug
- Thermocouple Type "S"

Optional accessories for extra charge:

- Ht INDUSTRY controller
- Injector with an exhaust fan and draft diverter (only with Ht INDUSTRY controller)
- Calibration of the measuring system
- Interface RS232 or EIA485
- Set HtMonit (includes interface + software)

Injector with an exhaust fan and draft diverter (only with Ht INDUSTRY controller)

Furnace type	Controller	Tmax	Volume	External dimensions	Internal dimensions	Input	Weight	Voltage	Furnace protection	Max. carrying capacity of bottom
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	kg	V	A	kg
LMH 04/12	Ht40 AL	1200	4	490x540x720	170x90x275	3	43	230	16/1	10
LMH 07/12	Ht40 AL	1200	7	490x540x720	170x170x275	3	46	230	16/1	10
LMH 11/12	Ht40 AL	1200	11	570x540x720	255x165x255	3,5	53	230	16/1	15
LMH 04/12	Ht INDUSTRY	1200	4	490x540x720	170x90x275	3	43	230	16/1	10
LMH 07/12	Ht INDUSTRY	1200	7	490x540x720	170x170x275	3	46	230	16/1	10
LMH 11/12	Ht INDUSTRY	1200	11	570x540x720	255x165x255	3,5	53	230	16/1	15

Technical changes reserved

Vertical charging (samples for testing) into a ceramic muffle. This muffle prevents the access of possibly aggressive materials, formed during heat treatment, to the heating elements. Rust-resistant construction, an attractive design, a perfect distribution of the temperature, top insulating materials (low power consumption with the possibility of a fast start with the asked temperature). These furnaces have a programmable temperature adjustment with a high accuracy, solid state relays for more fluent and quieter operation with a minimum disturbance of the surrounding mechanism. They also have a perfect workshop processing, the hardware, and top operating safety.

Standard design of furnace includes:

- Ht40 AL controller
- The lid is fulfilled by the sedge of mineral fibre, manually opened lid
- Muffle insulated with the matting of the mineral grain
- Heating spiral on the muffle
- Supply cable fitted with single-phase plug
- Circuit breaker on the back side of the furnace
- All electro elements placed in the area below the muffle
- Thermocouple Type "S"

Optional accessories for extra charge:

- Ht INDUSTRY controller
- Protective atmospher inlet
- Calibration of the measuring system
- Interface RS232 or EIA485
- Set HtMonit (includes interface + software)

Furnace type	Controller	Tmax	Volume	External dimensions	Internal dimensions	Input	Weight	Voltage	Furnace protection	Max. carrying capacity of bottom
		°C	l	(wxhxd) mm	(Øxh) mm	kW	kg	V	A	kg
LMV 2/12	Ht40 AL	1200	2	300x470x300	110x160	1,8	30	230	16/1	5
LMV 5/12	Ht40 AL	1200	5	300x550x350	170x230	2,6	40	230	16/1	5
LMV 2/12	Ht INDUSTRY	1200	2	300x470x300	110x160	1,8	30	230	16/1	5
LMV 2/12	Ht INDUSTRY	1200	5	300x550x350	170x230	2,6	40	230	16/1	5

Technical changes reserved

For special laboratory and research uses at which is charge loaded in a ceramic tube. These furnaces have all stainless-steel design, premium insulation materials (low electricity consumption, the possibility of a quick rise to the required temperature). They have programmable temperature control, semi-conductor relay for more fluent and noiseless operation, minimum interference of surrounding devices. Furnaces also have a perfect workshop design, technical equipment and high operational safety.

Standard design of furnace includes:

- Ht40 AL controller
- Frameless construction made of a stainless steel shell of bent sheet metal
- Desktop design
- Upper part of the furnace is manually tilted up by a handle
- Heating spirals are located in the insulation grooves
- Insulation from the mineral fibre insulation boards
- Electric wiring elements are placed in a separate switchboard
- Thermocouple Type "S"

Optional accessories for extra charge:

- Ht INDUSTRY controller
- Protective atmosphere inlet
- Stand for vertical positioning of the furnace
- Tube packer of mineral fibre
- three-zone heating system for models with tube length 750 mm
- Calibration of the measuring system
- Interface RS232 or RS485
- Set HtMonit (includes interface + software)

Furnace type	Controller	Tmax	External dimensions	Internal Ø of tube	Heating zone length	Tube lenght	Input	Weight	Voltage
		°C	(wxhxd) mm	Ø mm	mm	mm	kW	kg	V
LT 50/300/13	Ht40 AL	1300	570x310x510	50	300	660	3,2	75	230
LT 50/500/13	Ht40 AL	1300	810x310x510	50	500	900	5	85	400
LT 50/750/13	Ht40 AL	1300	1100x310x510	50	750	1220	8	95	400
LT 75/500/13	Ht40 AL	1300	810x400x600	75	500	660	6,5	85	400
LT 75/750/13	Ht40 AL	1300	1100x400x600	75	750	900	10	95	400
LT 100/500/13	Ht40 AL	1300	810x450x650	100	500	1220	7	85	400
LT 100/750/13	Ht40 AL	1300	1100x450x650	100	750	660	11,5	95	400
LT 50/300/13	Ht INDUSTRY	1300	570x310x510	50	300	660	3,2	75	230
LT 50/500/13	Ht INDUSTRY	1300	810x310x510	50	500	900	5	85	400
LT 50/750/13	Ht INDUSTRY	1300	1100x310x510	50	750	1220	8	95	400
LT 75/500/13	Ht INDUSTRY	1300	810x400x600	75	500	660	6,5	85	400
LT 75/750/13	Ht INDUSTRY	1300	1100x400x600	75	750	900	10	95	400
LT 100/500/13	Ht INDUSTRY	1300	810x450x650	100	500	1220	7	85	400
LT 100/750/13	Ht INDUSTRY	1300	1100x450x650	100	750	660	11,5	95	400

Technical changes reserved

These high temperature furnaces are used for research and laboratory tests. In addition to sintering dental ceramics such as tooth bridges made of zirconium oxides, for sintering of technical and quartz glass, material tests in metallurgy and other special-purpose applications. Desktop and freestanding models of compact high-temperature furnaces have many preferences. In particular this involves the first-class processing of stainless mantle, high-quality insulation and simple attendance. Depending on their sizes, all models are marked by their low weight. Therefore the desktop models can be easily placed on the most suitable place for charging. The charging edge of the freestanding models is designed for the easiest charging.

Standard design of furnace includes:

- Ht NDUSTRY controller
- Frameless construction made of a stainless steel shell of bent sheet metal (furnaces VP02; VP04, table models)
- Frame construction with stainless front and door (furnaces VP10, VP20)
- Hand operated door to the side equipped with a safety end limit switch
- Insulation from the ceramic fibre insulation boards
- Forced cooling of mantle through valve
- Heating elements from the material MoSi2 hanged vertically on the side walls
- Solid state relay - SSR regulating primary circuit of the transformer
- Thermocouple Type "B", placed in the chamber ceiling

Optional accessories for extra charge:

- Protective atmosphere inlet
- Calibration of the measuring system
- Interface RS232 or EIA485
- Set HtMonit (includes interface + software)

Furnace type	Controller	Tmax	Volume	External dimensions	Internal dimensions	Input	Weight	Voltage	Furnace protection	Max. carrying capacity of bottom
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	kg	V	A	kg
VP 02/16	Ht INDUSTRY	1600	2	660x680x740	130x150x135	3	90	230	16/1	1
VP 04/16	Ht INDUSTRY	1600	4	660x680x740	130x160x180	3	100	230	16/1	4
VP 10/16	Ht INDUSTRY	1600	10	850x1595x775	200x200x250	6	290	400	25/3	6
VP 20/16	Ht INDUSTRY	1600	20	850x1595x775	250x250x310	8	315	400	32/3	10
VP 70/16	Ht INDUSTRY	1600	70	1100x1750x1150	400x300x600	14	350	400	63/3	12
VP 02/17	Ht INDUSTRY	1700	2	660x680x740	130x150x135	3	90	230	16/1	1
VP 04/17	Ht INDUSTRY	1700	4	660x680x740	130x160x180	3	100	230	16/1	4
VP 10/17	Ht INDUSTRY	1700	10	850x1595x775	200x200x250	6	290	400	25/3	6
VP 20/17	Ht INDUSTRY	1700	20	850x1595x775	250x250x310	8	315	400	32/3	10
VP 70/17	Ht INDUSTRY	1700	70	1100x1750x1150	400x300x600	14	350	400	63/3	12

Technical changes reserved

Excellent for firing tests of several samples together under various temperatures. Acceleration of the firing of the samples is helped by the construction of the furnace, top insulating materials (low power consumption, the possibility of a quick rise to the desired temperature), a programmable temperature adjustment, solid state relays (fluent and quieter running, with a minimum of disturbance from the surrounding mechanism), perfect workshop processing, hardware, and top operational safety.

Standard design of furnace includes:

- Ht INDUSTRY controller
- Multilayered insulation
- Lid of the furnace is lagged by sedge of mineral grains
- Manually operated door opening
- Spiral heating wire is slide in grooves on sidewall of the furnace
- All electro elements placed in the area below the muffle
- Thermocouple type "S"

Accessories for an additional charge:

- Multichannel meter Ht100 (possibility to capture up to ten values)
- Interface RS232 or EIA485
- Set HtMonit (includes interface + software)

Type LAC	Controller	Tmax	Volume	External dimensions	Internal dimensions	Input	Weight	Voltage	Furnace protection
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	kg	V	A
SP 30/13	Ht INDUSTRY	1300	30	1700x1200x500	1400x140	7	240	400	20/3

Technical changes reserved

PKE quenching chamber furnaces are primarily used for quenching, annealing, and preheating of metal charges before forging, in oxidizing atmosphere. Furnaces with a protective atmosphere inlet can be used for heat treatment of the charge in partially oxidizing atmosphere. For charge processing in protective atmosphere, we recommend inserting a separate retort into the furnace.

Standard design of furnace includes:

- Mmanually operated door
- Ht40 P controller
- Furnace stand (except models PKE 12 and PKE 18)

Optional accessories for extra charge:

- Graphic temperature recorder
- RS232 or EIA485 interface (to interface the controller to a PC)
- Inlet of protective atmosphere
- Metal furnace floor plate
- Optimization of the temperature field to meet DIN 17052-1 ΔT20°C in the inner working chamber of the furnace (in empty furnace at Tmax)
- Calibration of the measuring system
- Small hardening table for PKE 12/12 and PKE 18/12(R) with a combination of quenching containers, ventilator, and PP 20 furnace- see small hardening work station data sheet
- Large hardening table for the PKE 25/12 through PKE 90/12 with hardening containers and ventilator - see large hardening work station data sheet
- Quenching container

Atypical accessories:

- Additional cooling
- Atypical stand
- Retort for quenching in protective atmosphere

Furnace type	Controller	Tmax	Volume	External dimensions	Internal dimensions	Input	Weight	Voltage	Furnace protection	Max. carrying capacity of bottom
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	kg	V	A	kg
PKE 12/12	Ht40 P	1280	12,2	700x570*x850	250x200x250	3	95	230	16/1	20
PKE 18/12	Ht40 P	1280	17,5	700x570*x950	250x200x350	3,5	115	230	16/1	30
PKE 18/12R	Ht40 P	1280	17,5	700x570*x950	250x200x350	5,5	115	400	16/3	30
PKE 25/12	Ht40 P	1280	25	700x1300x1100	250x200x500	7	140	400	16/3	50
PKE 45/12	Ht40 P	1280	44	800x1350x1100	350x250x500	13	165	400	25/3	100
PKE 65/12	Ht40 P	1280	65	800x1350x1350	350x250x750	16	195	400	32/3	130
PKE 90/12	Ht40 P	1280	87	800x1350x1600	350x250x1000	18	225	400	32/3	150

* Height of furnace with stand: 1300 mm

Technical changes reserved

TEMPERING CHAMBER FURNACES PP

Chamber furnaces with a forced circulation of the inner atmosphere are used for special applications such as preheating and annealing in industry or the preheating of moulds. Our standard range meets most requirements. A stainless steel muffle with a long life, high mechanical and corrosion resistance, horizontal circulation ensures the even distribution of air inside the furnace. And the first-rate insulating materials bear low operational expenses of the furnace.

Detail of door closing

Standard design of furnace includes:

- Manually operated door opening to the side
- Ht40 AL controller: furnaces for temperature 450°C
- Ht INDUSTRY controller: furnaces for temperatures 650°C and 850°C
- Shelves (according to the table)
- Manually controlled ventilation flap
- Stand

Optional accessories for extra charge:

- Inlet of protective atmosphere
- Semi-gastight furnace design
- Graphic temperature recorder (the regulator and recorder are located in a small switchboard on the side of the furnace)
- RS232 or EIA485 interface
- HtMonit set (includes interface and software)
- Automatic ventilation flap
- Optimization of the temperature field to meet DIN 17052-1 ΔT10°C in the inner chamber of the furnace (empty furnace at Tmax)
- Calibration of the measuring system

Atypical accessories:

- Atypical stand
- Door opening to the left and upwards (options of hydraulic or pneumatic, pantographic hinges)
- Additional shelves
- Single-handed manual opening (standard for models PP 20 through PP 140)
- Forced cooling

Furnace type	Controller	Tmax	Volume	External dimensions	Internal dimensions	Input*	Number of shelves	Max. carrying capacity of shelves	Weight	Voltage	Furnace protection	Max. carrying capacity of bottom
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	ks	kg	kg	V	A	kg
PP 20/45	Ht40 AL	450	20	700x650x1050	300x200x350	3	-	-	115	230	16/1	30
PP 40/45	Ht40 AL	450	35	800x1450x1050	300x300x400	6	2	15	160	400	16/3	50
PP 70/45	Ht40 AL	450	70	850x1550x1150	350x400x500	8	2	20	190	400	20/3	80
PP 140/45	Ht40 AL	450	135	950x1650x1250	450x500x600	12	2	30	300	400	20/3	150
PP 270/45	Ht40 AL	450	270	1150x1750x1650	600x600x750	20	2	35	580	400	40/3	200
PP 540/45	Ht40 AL	450	540	1300x1950x1800	750x800x900	24	2	40	750	400	50/3	250
PP 20/65	Ht INDUSTRY	650	20	700x650x1050	300x200x350	3	-	-	130	230	16/1	30
PP 40/65	Ht INDUSTRY	650	35	800x1450x1050	300x300x400	6	2	15	200	400	16/3	50
PP 70/65	Ht INDUSTRY	650	70	850x1550x1150	350x400x500	8	2	20	250	400	20/3	80
PP 140/65	Ht INDUSTRY	650	135	950x1650x1250	450x500x600	12	2	30	350	400	20/3	150
PP 270/65	Ht INDUSTRY	650	270	1150x1750x1650	600x600x750	20	2	35	720	400	40/3	200
PP 540/65	Ht INDUSTRY	650	540	1300x1950x1800	750x800x900	24	2	40	850	400	50/3	250
PP 20/85	Ht INDUSTRY	850	20	850x650x1050	300x200x350	3	-	-	130	230	16/1	30
PP 40/85	Ht INDUSTRY	850	35	850x1450x1050	300x300x400	7	2	15	200	400	20/3	50
PP 70/85	Ht INDUSTRY	850	70	900x1550x1150	350x400x500	9	2	20	250	400	20/3	80
PP 140/85	Ht INDUSTRY	850	135	1000x1650x1250	450x500x600	14	2	30	350	400	25/3	150
PP 270/85	Ht INDUSTRY	850	270	1300x1750x1650	600x600x750	20	2	35	720	400	40/3	200
PP 540/85	Ht INDUSTRY	850	540	1500x1950x1800	750x800x900	30	2	40	850	400	50/3	250

*The ventilator wattage on PP 20 is 0,25kW, on PP 40-140 models for all temperatures and PP 270/45 is 0,37kW and models PP 270/85 and PP 540 for temperatures is 1,1kW.

Technical changes reserved

The dryers are suitable for drying, vulcanization, preheating, curing and other modifications of various materials in plastics, rubber, automotive, electrotechnic industry etc. A stainless steel muffle with a long life, high mechanical resistance and corrosion resistance. Horizontal circulation ensures the even distribution of air inside the dryer, and the first-rate insulating material bears low operational expenses.

Standard design of dryer includes:

- Ht40 AL controller
- Limit unit
- Venting bleeder
- Stand
- Shelves (see table)

Optional accessories for extra charge:

- Graphic temperature recorder
- Ht INDUSTRY controller
- Relative humidity measurement
- METREX gas analyzer
- Automatic venting flap
- Exhaust fan (serves for forced waste product exhaust)
- Forced cooling
- Travel wheels
- Door inspection window
- Interior furnace lighting
- Door opening to the right
- Single-handed door closing
- RS232 or EIA485 interface
  (serves for connection of the controller to a PC)
- Set HtMonit (includes interface + software)
- Optimization of the temperature field to meet DIN 17052-1 ΔT10°C in the inner space of the furnace
  (in empty furnace at Tmax)
- Calibration of the measuring system

Atypical accessories:

- Door opening upwards (electro-hydraulic)
- Door opening upwards (pneumatic - pantograph)
- Door opening upwards (manual - pantograph)
- Adaptation for vertical circulation
  of the atmosphere in the furnace
- Additional shelves

Furnace type	Controller	Tmax	Volume	External dimensions	Internal dimensions	Input	Number of fans	Number of shelves	Max. carrying capacity of shelves	Weight	Voltage	Furnace protection	Max. carrying capacity of bottom
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	ks	ks	kg	kg	V		kg
S 60/02	Ht40 AL	200	60	1050x1350x950	450x300x450	2	1	1	15	60	230	16/1	40
S 100/02	Ht40 AL	200	100	1050x1550x1000	450x500x450	3	2	1	15	100	230	16/1	50
S 250/02	Ht40 AL	200	240	1400x1550x1200	800x500x600	4	1	1	25	250	400	16/3	70
S 400/02	Ht40 AL	200	380	1400x1750x1200	800x800x600	4	1	1	25	350	400	16/3	70
S 60/03	Ht40 AL	300	60	1050x1350x950	450x300x450	3	1	1	15	60	230	16/1	40
S 100/03	Ht40 AL	300	100	1050x1550x1000	450x500x450	3	2	1	15	100	230	16/1	50
S 250/03	Ht40 AL	300	240	1400x1550x1200	800x500x600	4	1	1	25	250	400	16/3	70
S 400/03	Ht40 AL	300	380	1400x1750x1200	800x800x600	6	1	1	25	350	400	16/3	70

Technical changes reserved

GASTIGHT HARDENING CHAMBER FURNACES WITH RETORT PKR

PKR gastight chamber furnaces with retort are used especially for heat treatment of materials in controlled atmosphere (argon, nitrogen, forming gas etc.) with low gas drain, to the max. temperature 1000°C (1100°C when using an Inconel retort) for bright annealing, tempering, soldering, steel powder sintering.

Standard design of furnace includes:

- Manual exhaust flap
- Manually operated door
- Ht INDUSTRY controller
- Limit unit
- Stand
- Manually-operated inlet of protective atmosphere for one gas
- Standard manometer to check for overpressure in the retort
- Inlet for connection of pump (maximum pressure in the retort when the vacuum pump is turned on is 2 mbar)
- G ½" adaptor to interface the rubber hose interface to the cooling collar
- Thermistor for retort collar temperature checking and signal alarm for presence of coolant in the retort collar
- Safety overpressure valve on output of protective atmosphere with pressure level 0,2 bar
- Ammeters to check the condition of the heating elements (number depends on the number of phases involved in heating)

Optional accessories for extra charge:

- Graphic temperature recorder
- Interface RS232 or EIA485
- Atypical stand
- Charge thermocouple
- Vacuum pump
- Manovacuometer
- Spare retort
- Automatic supply of protective atmosphere for one or more gases
- Calibration of the measuring system
- Optimization of the temperature field to fulfill DIN 17052-01 ΔT 20°C in inner space of the furnace (in empty furnace, at Tmax.)
- Forced cooling
- Retort made of Inconel material
- Monitoring system of optimal pressure in the retort (only in combination with automatic atmosphere inlet)

Furnace type	Controller	Tmax	Volume	External dimensions	Internal retort dimensions	Input	Weight	Voltage	Furnace protection	Max. carrying capacity of bottom
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	kg	V	A	kg
PKR 35/10	Ht INDUSTRY	1000*	24	1400x1450x1300	220x200**x450	11	400	400	20/3	
PKR 55/10	Ht INDUSTRY	1000*	30	1450x1450x1300	320x135**x450	13	570	400	25/3	150
PKR 130/10	Ht INDUSTRY	1000*	75	1450x1450x1550	450x200**x700	21	950	400	40/3	200
PKR 180/10	Ht INDUSTRY	1000*	110	1650x1650x1550	550x235**x700	29	1050	400	50/3	200
PKR 350/10	Ht INDUSTRY	1000*	230	1800x1750x1850	700x340**x1050	50	1350	400	80/3	300

* Tmax is 1100°C with retort Inconel ** internal height of retort without vault

Technical changes reserved

GASTIGHT HARDENING CHAMBER FURNACES WITH RETORT AND INTERNAL ATMOSPHERE CIRCULATION PKRC

PKRC gastight chamber furnaces with retort and internal atmosphere circulation are used especially for heat treatment of materials in controlled atmosphere (argon, nitrogen, forming gas etc.) with low gas drain, to the max. temperature 950°C (1100°C when using an Inconel retort) for bright annealing, tempering, soldering, steel powder sintering.

Circulation fan in the furnace door

Standard design of furnace design:

- Manual exhaust flap
- Ht INDUSTRY controller
- Limit unit
- Stand
- Manually-operated inlet of protective atmosphere for one gas
- Standard manometer to check for overpressure in the retort
- Inlet for connection of pump (maximum pressure in the retort when the vacuum pump is turned on is 2 mbar)
- G ½" adaptor to interface the rubber hose interface to the cooling collar
- Thermistor for retort collar temperature checking and signal alarm for presence of coolant in the retort collar
- Safety overpressure valve on output of protective atmosphere with pressure level 0,2 bar
- Ammeters to check the condition of the heating elements (number depends on the number of phases involved in heating)

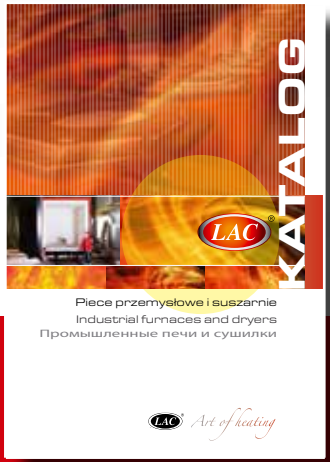
Optional accessories for extra charge:

- Graphic tempereture recorder
- Interface RS232 or EIA485
- Atypical stand
- Charge thermocouple
- Vacuum pump (using vacuum pump RB 0006)
- Manovacuometer
- Spare retort
- Automatic supply of protective atmosphere for one or more gases
- Calibration of the measuring system
- Optimization of the temperature field to fulfill DIN 17052-01 ΔT 20°C in inner space of the furnace (in empty furnace, at Tmax.)
- Forced cooling
- Retort made of Inconel material
- Monitoring system of optimal pressure in the retort (only in combination with automatic atmosphere inlet)

Furnace type	Controller	Tmax	Volume	External dimensions	Internal retort dimensions	Input	Weight	Voltage	Furnace protection	Max. carrying capacity of bottom
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	kg	V	A	kg
PKRC 55/09	Ht INDUSTRY	950*	30	1450x1450x1450	320x135**x370	13	600	400	25/3	150
PKRC 130/09	Ht INDUSTRY	950*	75	1450x1450x1950	450x200**x620	21	980	400	40/3	200
PKRC 180/09	Ht INDUSTRY	950*	110	1650x1650x2050	500x235**x620	29	1100	400	50/3	200
PKRC 350/09	Ht INDUSTRY	950*	230	1800x1750x2350	700x240**x970	50	1380	400	80/3	300

* Tmax is 1100°C with retort Inconel ** internal height of retort without vault

Technical changes reserved



You can learn more about heat treatment furnaces in the catalog of "Industrial furnaces and dryers". On request in printed form or download on our website www.lac.cz

HARDENING LABORATORY TABLE SKM

The hardening laboratory table can be used for preheating, quenching and tempering charge hardening, powder cementation and artificial ageing.

The SKM contains::

- Small hardening workbench
- Hardening: PKE 12/12, PKE 18/12(R), PK 16/12(R), PK 17/12(R), furnaces L and LH
- Tempering: PP 20/45, PP 20/65

Standard hardening centre equipment includes:

- Hardening vessel for water (SKM: 50-60l)
- Hardening vessel for oil (SKM: 50-60)
- Baskets for the vessels
- Cooling fan for air hardening

Optional equipment for extra charge:

- Spare vessels
- Additional baskets for vessels
- Refractory shaped pieces to surround the hardening grid
- Thermostat-controlled heating of the hardening medium
- Calibration of the measuring system

Hardening vessel

Furnace type	Fan output	External dimensions	Vessels dimensions	Grid dimensions	Input	Weight	Voltage
	W	(wxhxd) mm	mm	mm	kW	kg	V
SKM	120	1855*x850x750	200x550x550	350x350	3	200	230

Dimensions including side vessel

Technical changes reserved

FURNACE FOR MECHANICAL TESTING MATERIALS AT INCREASED TEMPERATURE LT 90/30/11

This laboratory tube furnace is designed for testing materials up to 1100°C and is mounted in the frame of blasting stool. Tested sample enclosed in dies is positioned in the electrically heated furnace workspace (splitted into 2 parts) in which the controller maintains temperature according to a running program or regulates it to a constant value.

Description of construction:

- Ht40 AL controller
- Frameless construction made of a stainless steel shell of bent sheet metal
- Double door design
- Insulation from the mineral fibre insulation boards
- Heating spirals are located in the insulation grooves
- Temperature in the working chamber is measured by thermocouples Type "S"
- Electric wiring elements are placed in a separate switchboard
- Thermocouples Type "S"

Furnace type	Controller	Tmax	External dimensions	Refractory tube length	Internal Ø of tube	Heating zone length	Input	Weight	Voltage
		°C	(wxhxd) mm	mm	Ø mm	mm	kW	kg	V
LT 90/300/11	Ht40 AL	1100	600x700x470	410	60	300	4,6	41	400

Technical changes reserved

SMALL WORKPLACE CHTZ

The workplace serves for the heat and chemical-heat treatment of metal parts. It is suitable for the treatment of those parts in which the quality of surface is important. The charge is under a protective atmosphere during treatment and transportation into the hardening bath which prevents the creation of clinkers on the charge surface.

The line can be used for the following types of chemical thermal treatment:

- Hardening
- Carburizing
- Carbonitriding
- Nitriding
- Tempering

The workplace is made up of these devices:

CARBONIZING FURNACE
Inner dimensions (wxhxd): 300x150x400 mm
Max. work temperature: 950°C
Input: 13kW
Max. charge weight: 20kg

HARDENING BATH:
Volume of hardening medium: approx. 200l
Input: 3kW
Equipped with heating, cooling and circulation of hardening medium
Pneumatically controlled grid for charge

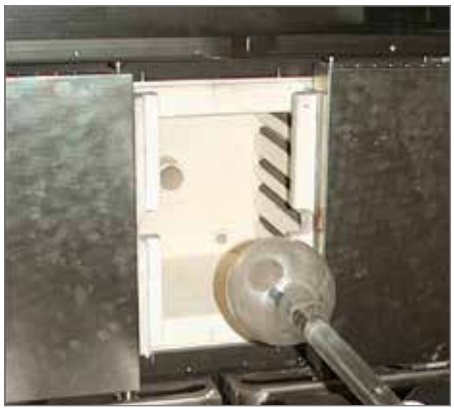
NITRIDING FURNACE
Inner dimensions (wxhxd): 300x150x400 mm
Max work temperature: 650°C
Input: 13kW
Max. charge weight: 20kg

TEMPERING FURNACE:
Inner dimensions (wxhxd): 300x300x400 mm
Max. work temperature: 850°C
Input: 7kW
Max charge weight: 50kg

PROCESS MEDIA DISTRIBUTOR:
Serves for process media supply into the case hardening, nitriding and tempering furnace.
Process media: methanol, propane, carburizing, nitrogen, air.

LABORATORY CALCINING FURNACE LH 30/12

This atypical furnace is designed for laboratory calcination of titanium dioxide (TiO_2). The charge is inserted into the quartz glass retort. The retort is filled into the furnace space by stacker. The temperature is controlled by temperature controller. The furnace consists of laboratory furnace, automatic retort stacker and carrier table. All these part are connected with a bolt and thus form a compact unit.



Description of construction:

- Frameless construction made of a stainless steel shell of bent sheet metal
- Into a shell is inserted module with insulation and furnace mask
- Double door controller by pneumatic cylinders
- The chamber is made up of lightened bricks
- Space between shell and module is cooled/ventilated by exhaust fan located on the back wall of furnace
- Furnace is equipped with injector exhaust fumes from retort
- Retort loading in into the chamber provides automatic stacker
- Retort rotation ensures transmission with adjustable speed
- Heating system consists of heating spirals which are located in the grooves on the sides of chamber
- Temperature in the working chamber is measured by thermocouples Type S
- Control system is in a separate switchboard and where is located PLC control panel with controllers
- Furnace is equipped with communication line RS485 a EIA232

Furnace type	Control system	Tmax	Volume	External dimensions	Internal chambre dimensions	Input	Weight	Voltage
		°C	l	(wxhxd) mm	(wxhxd) mm	kW	kg	V
LH 30/12	PLC	1200	30	1090x1540x2070	310x310x310	5,5	253	400

Technical changes reserved

LABORATORY DISPERSING UNIT LD 05

Laboratory dispersing unit LD 05 is designed for direct manufacturing of slurry containing metal nanoparticles from the dry powder. The equipment provides manufacturing capacity of 500 grams of slurry in 20 minutes. Laboratory dispersing unit LD 05 is equipped with vacuum pump and inert gas inlet with automatic regulation enabling to process a metal nano--powder and slurry under protective atmosphere. Protective inert atmosphere prevent product degradation by air oxygen.

Description of construction:

- Body completely made from stainless steel
- Control unit regulating dispersing speed and securing protective atmosphere
- Batching plant dedicated for transfusion of nano-material from a transportation keg into the reservoir
- Reservoir made from stainless steel of inner volume of 0,2l dedicated for dry nano-powder application into the reaction vessel
- Reactor vessel made from borosilicate glass with jacket for temperature control of the process (heating/cooling)
- Vacuum pump connected to the control unit

Accessories for an additional charge:

- Transportation keg
- Measuring probes for pressure sensor, temperature measurement, pH electrode etc.

INDUCTION MELTING FURNACE I

NEW PRODUCT

This furnace is designed mainly for the melting of small amounts of non--ferrous metal (gold, silver, copper, brass).

Benefits:
- High energy efficiency
- Extremely rapid melting with a minimum of burning
- Low cooling water and electricity consumption while melting
- Very compact design
- Melt removal by tilting or removal of crucible
- Simple user-friendly operation

Standard design of furnace includes:
- HF source
- Flow sensor
- Foot pedal switch
- Graphite crucible (1pc)
- Protective ceramic insert (1pc)
- Separate power switch

Optional accessories for extra charge:
- Thermocouple to control overheating
- Crucible insulating lid
- Water meter to show amount of water consumed
- Tongs for crucible manipulation
- Power cable

Consumables:
- Graphite crucibles
- Ceramic protective insert

Atypical accessories:
- Closed cooling circuit
- Gas burner for protective atmosphere

Furnace type	Capacity	Tmax	Crucible volume	Input	Weight	Voltage	Protection	Source	Furnace dimensions	Furnace height after tilting	Furnace depth after ejection from stand
	kg CU	°C	l	kW	kg	V	A	(wxhxd) mm	(wxhxd) mm	mm	kg
I 03/13	2,5	1300	0,3	7,5	50	230	25	350x410x520	350x300x400	380	253

Technical changes reserved

TEMPERATURE CONTROLLERS

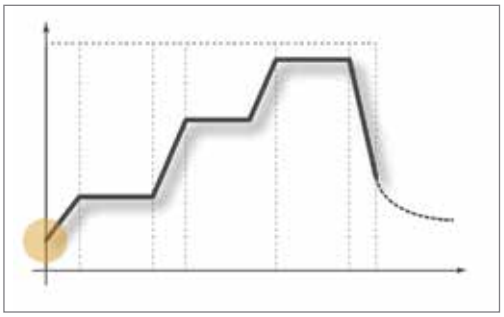
Electric resistance furnaces manufactured by LAC Ltd. are fitted with the following types of high duality PID controllers: Ht60B, Ht40 P, Ht40 AL or Ht INDUSTRY. These types of controllers are microprocessor controlled devices meeting all the requirements for temperature control and the security of electro-thermal devices.

HT60B TEMPERATURE CONTROLLER

- PID/2-state controller
- Controlling of stp value
- 1 measuring input
- 2 outputs
- Communication line
- Ramp function
- Automatic/manual operation

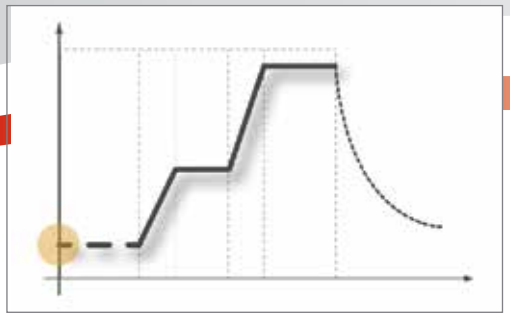
HT40 P TEMPERATURE CONTROLLER

- 1 measuring input
- 3 outputs
- Communication line
- 10 programs, each program with 15 steps
- Real-time clock
- Superior controller in system „Master - Slave"
- Datalogger with 500 measurements
- Easy operation



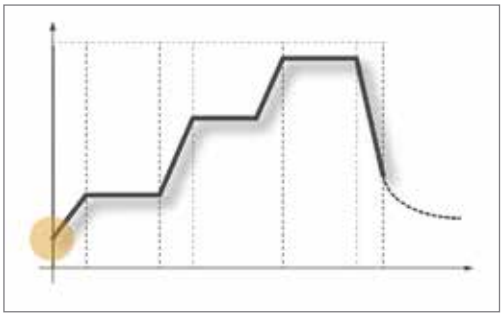
HT40 AL TEMPERATURE CONTROLLER

- 1 measurement input
- 3 control outputs
- Communication line
- Simple program (2x ramp-up, 2x soak)
- Possibility of delay in starting the program
- Running a program using the keyboard
- Simple operation



HT INDUSTRY TEMPERATURE CONTROLLER

- 1 input
- 2 controller outputs (heating, cooling)
- Alarm output
- 4 event outputs
- 2 communication lines (PC, Master – Slave)
- 2 digital outputs
- 30 programs with 15 steps
- Changing in a program during its course
- Start of the program with the key
- Start of the program with the real-time clock
- Datalogger, memory of measured values

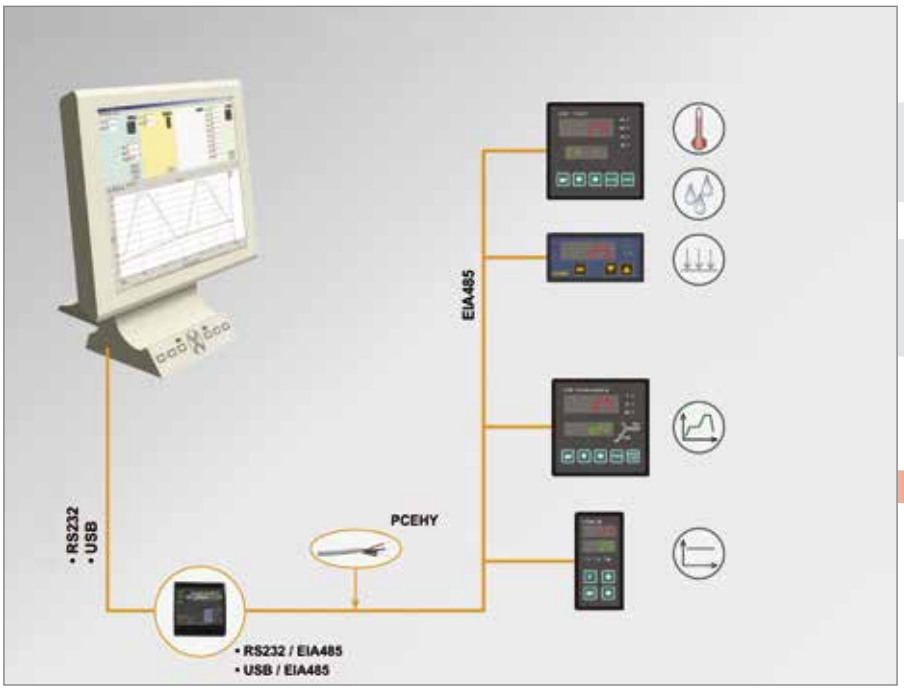


MONITORING SOFTWARE HTMONIT

This program is designed for monitoring 1 up to 4 devices of HT series.

The program allows:

- Monitoring connected devices
- Insert data into the database
- Display measured data in the graph
- Search in the graph and print graphs and tables
- Program Ht INDUSTRY controller profiles
- Start or end programs



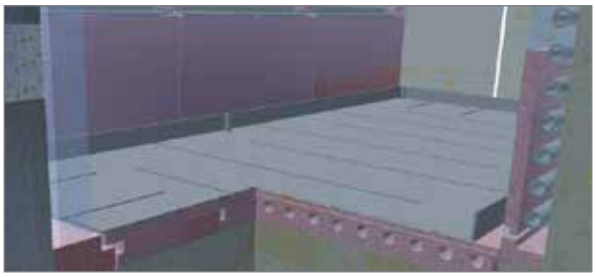
CALIBRATION OF THE CONTROLLER MEASURING ENTRY
Issue of a calibration certificate defining the deviation between the temperature values displayed by the controller.

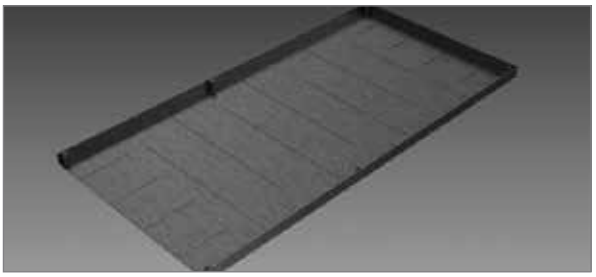
CALIBRATION OF THE MEASURING SYSTEM
Issue of a calibration certificate which defines the deviation and the theoretical values entering the controller from the thermocouple and reflecting the deviation of all elements used in the measuring system.

SOLID STATE RELAY - SSR
Switch devices which contain no moving parts that can make noise or that can be worn out by frequent switching are used to control furnace operations.

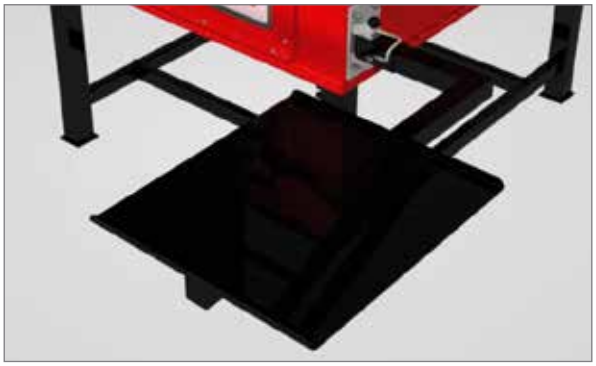
PLATE FOR FURNACE BOTTOM – FOR LABORATORY FURNACES
Furnace bottom plate covering and protecting the heating elements or bottom insulation against damage and prevents its contact with the charge.

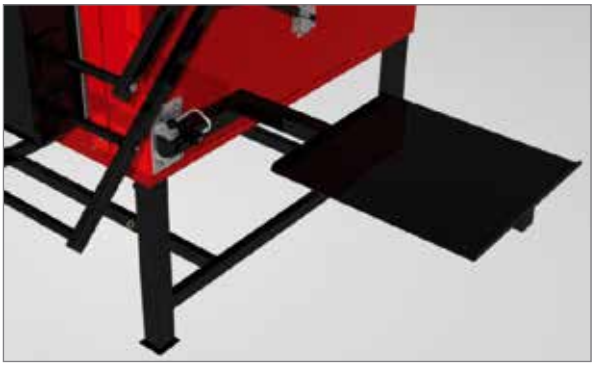
STEEL PLATE FOR FURNACE BOTTOM
Metal plate with a protective frame protecting the bottom of the furnace against damage while manipulating with heavy charge in the furnace chamber.





ROTARY TABLE
Hinged rotary table secured to the side of the furnace, used as a workspace for handling the charge in front of the furnace. The table is removable, its height is the same as the height of the furnace sill.





GRAPHIC TEMPERATURE RECORDER
This device is located in the control panel of the furnace and provides a paper print out recording of the temperature in the furnace at any given time.

STAND FOR MOUNTING FURNACE IN VERTICAL POSITION
Only for LT furnaces. The stand allows installation of the furnace into the position where tube is oriented vertically.

TUBE SEAL FROM MINERAL FIBRE INSULATION
Only for LT furnaces. Shaped seal designed for enclosure of the ends of tube.

OPTIMIZATION OF THE TEMPERATURE FIELD TO FULFILL DIN 17052-01
Adjustment of the internal airflow, or adjustment of the furnace heating system according to the informa- tion detected by furnace measuring equipment. These adjustments provide optimization of temperature distribution in the furnace; alternatively the furnace can be fine-tuned for a specific charge.

COOLING

VENTILATION CHIMNEY
Ventilation of the inner furnace space, airflow cannot be controlled. On request, a seal made of insulating materials can be supplied.

SLIDERS FOR AIR SUPPLY CONTROL
The source of air supply to the inner space of the furnace is located at the bottom part of the door or in the bottom of the furnace. The amount of air suction can be regulated by covering the inlet using a simple mechanism – the slider.

MANUALLY CONTROLLED VENTILATION FLAP
Ventilation; the flap is opened or closed manually.

AUTOMATIC VENTILATION FLAP
Ventilation of the furnace inner space, flap opening or closing is controlled by the controller. The Ht INDUSTRY controller is necessary in order to use the automatic ventilation flap.

INJECTOR WITH AN EXHAUST FAN AND DRAFT DIVERTER
Stainless steel exhaust chimney with a fan that improves the exhaust from the furnace and together with installed draft diverter reduces their temperature and forms preparation for aggressive gases exhaust.

EXHAUST FAN – FOR FORCED EXHAUST OF WASTE PRODUCTS
The exhaust fan is connected to the automatic ventilation flap. Emissions of up to approximately 500 °C can be emitted directly from the furnace. For higher temperatures it is necessary to reduce the temperature of exhaust air by mixing it with cold air. The exhaust fan can only be used in combination with the Ht INDUSTRY controller.

FORCED COOLING—CANNOT BE COMBINED WITH SEMI-GASTIGHT DESIGN
Active cooling of the charge. Cool air is blown by the fan through the valve at the bottom of the furnace and then travels through the automatic ventilation flap into the furnace chamber. The furnace controller starts the fan and opens the flap according to the furnace cooling speed programmed. The forced cooling system can only be used in combination with the Ht INDUSTRY controller.

MULTI-ZONE HEATING SYSTEM

For some furnaces it is technically possible to divide heating system into several sections, and then is each section managed separately according to its own thermocouple. This solution is designed for furnaces that require very precise temperature distribution.

THREE-ZONE HEATING SYSTEM
The heating system divided into three parallel branches. It is intended only for LT type furnaces with a minimum pipe length of 750 mm.

STANDARDS RS232 OR EIA485

Standards RS232 and EIA485 serve as a communication link between a PC and an external electronic device. RS232 serves to connect one PC with one device, EIA485 can connect up to 30 devices, by using repeaters this number can be further increased.

SET HTMONIT – INCLUDES INTERFACE AND SOFTWARE

Set includes a connector for one of these interfaces situated on accessible place on the furnace, the furnace cable and PC software and equipment - HtMonit software.

INTERFACE RS232 OR EIA485

Includes a connector situated on an accessible place on the furnace.

GAS ANALYZER METREX

Serves to monitor the dangerous concentration of vapors during drying, its output is connected to an automatic ventilation flap or other elements to ensure the safeness (exhaust fan, siren, etc.).

PROTECTIVE ATMOSPHERE

PROTECTIVE ATMOSPHERE INLET

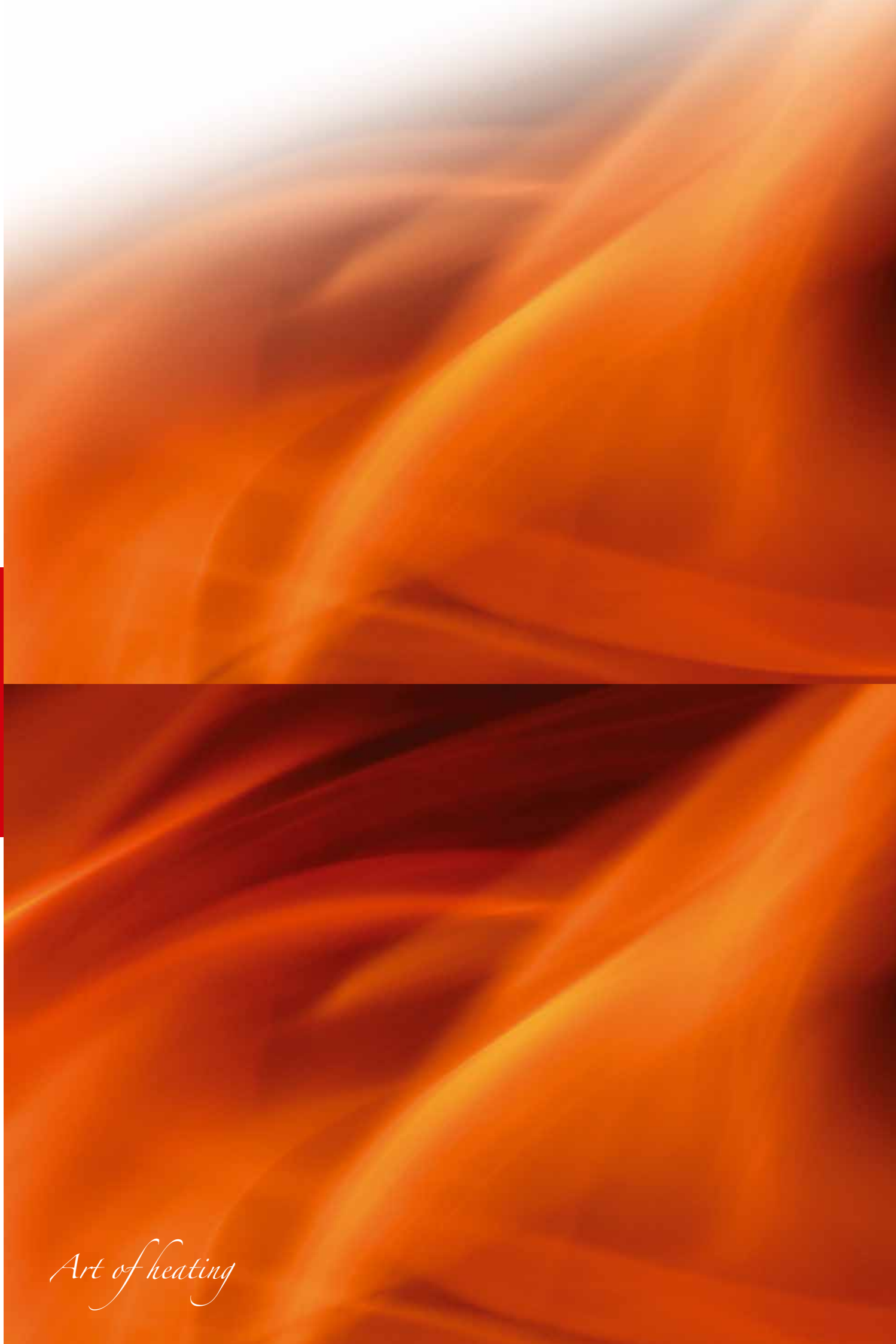
Preparation of the furnace for a supply of protective atmosphere into the furnace chamber with hose input on the side of the furnace. In smaller furnaces, e.g. 550 liters volume, a bottle reducing valve with a flow meter is included.

SEMI-GASTIGHT DESIGN OF THE FURNACE

Adjust of the furnace design to ensure the best possible gas-tightness of the furnace workplace. This version does not replace the gas-tight design, the furnace is not suitable for heat treatment under a defined protective atmosphere (e.g. bright annealing). This design is useful for heat treatment with the requirement to suppress oxidation.

RETORT FOR HEAT TREATMENT IN CONTROLLED ATMOSPHERE

A closed case from heat-resistant material with an inlet of protective atmosphere. The charge is inserted in the retort before being inserted into the furnace. The retort can be used for preventing oxidation or decarburization of steel parts during the heat treatment.


Art of heating

HEADQUARTERS

LAC, s. r. o.
Stefanikova 116
664 61 Rajhrad
Czech Republic

phone: +420 547 230 016
fax: +420 547 230 212
info@lac.cz
www.lac.cz

PRODUCTION PLANT: INDUSTRIAL FURNACES AND DRYERS

LAC, s. r. o.
Jiriho z Podebrad 26
664 62 Hrusovany u Brna
Czech Republic

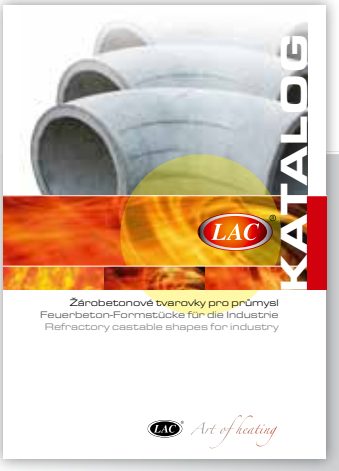
phone: +420 547 230 016
fax: +420 547 230 212
info@lac.cz
www.lac.cz

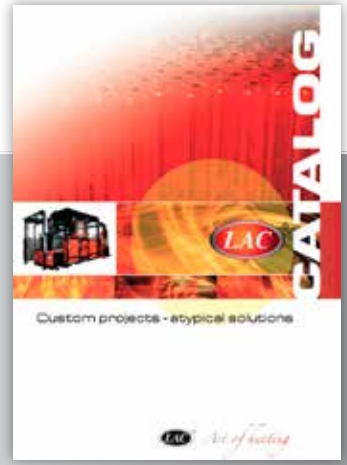
PRODUCTION PLANT: REFRACTORY CASTABLE SHAPES

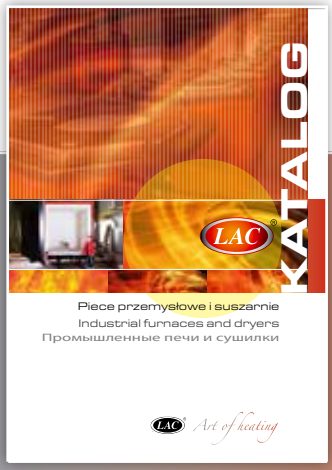
LAC, s. r. o.
Drnholecka 522
671 67 Hrusovany nad Jevisovkou
Czech Republic

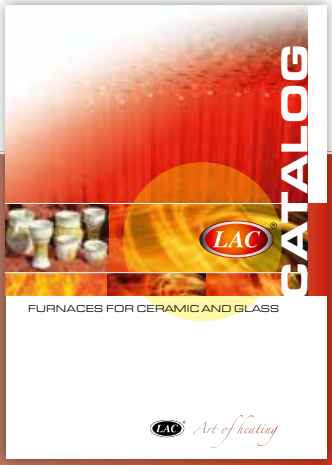
phone: +420 515 238 211
fax: +420 515 229 696
info@lac.cz
www.lac.cz

Art of heating









LAC, Ltd.
Stefanikova 116
664 61
Czech Republic

phone: +420 547 230 016
fax: +420 547 230 212
www.lac.cz