CATALOG

FURNACES FOR CERAMIC AND GLASS

Art of heating
IN CERAMIC AND GLASS SEGMENT LAC COMPANY PRODUCES MORE THAN 200 FURNACES PER YEAR
The LAC company profile

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

The products find application in many technological processes of thermal production, namely:

- Low-temperature technologies
- Laboratory technologies
- Technology for the industrial production of glass and industrial ceramics
- Technology for thermal processing of ferrous metals in metallurgy
- Alloys’ technology for non-ferrous metals and thermal processing of non-ferrous metals in metallurgy
- Technology for thermal and chemical-thermal metal processing
- Technology for heat processing in metals shaping
- Technology for heat processing in welding
- Technology for production of hobby glass and ceramics

The manufacturing program does not represent only serially manufactured furnaces and dryers, but even accommodates the needs for atypical furnaces according to specific requirements of the customer. Development and design office in tandem with a team of service technicians is a guarantee of quality service to customers and a promise in the next company growth. Significant part of business is the manufacture of refractory castable shapes, whose essential part is used in manufacture of industrial furnaces. Other users are metallurgy companies and manufacturers of boilers for burning wood, pellets, and biomass. In the area of refractory concrete shaped blocks, the company belongs among the largest manufacturers in Europe. The company offers also supplies of heating elements, refractory and insulation materials, regulating elements, and reconstruction of furnaces, heating systems and switchboards.

The aggressive growth of the company is illustrated by its present 200 employees, capital assets in the amount of 480,000 €, 25,000 m² for production, warehousing and company administration. In 2007 the company certified its quality management system according to ČSN EN 9001 and in 2010 passed recertification according to the new standard ČSN EN ISO 9001:2009. In 2008 the company opened a branch in China.
DEVELOPED, DESIGNED AND MANUFACTURED IN CZECH REPUBLIC

PERFECT WORKSHOP PROCESSING

LOW POWER CONSUMPTION

SAFE OPERATION

MAINTENANCE SERVICES

LONG LIFETIME
SUMMARY

I. HOBBY CERAMIC FURNACES

1. Circular furnaces M ................................................................. pg. 06
2. Circular furnaces MGF .............................................................. pg. 07
3. Chamber furnaces KE ............................................................. pg. 08
4. Chamber furnaces K ............................................................... pg. 09
5. Laboratory furnace L ............................................................ pg. 10

II. INDUSTRIAL CERAMIC FURNACES

6. Bogie-hearth chamber furnaces VKK ........................................ pg. 12

III. ACCESSORIES

7. Firing aids .............................................................................. pg. 13

IV. MEASUREMENT AND CONTROL ......................................................... pg. 14

V. DESCRIPTION OF ACCESSORIES ......................................................... pg. 16
Especially for “hobby” ceramic shops, but also for professional ceramics burning which need to be charged into the furnace from the top. The shape and design ensure a perfect temperature distribution and possibility of fast rise to desired temperature. Furnace shell is made of polished stainless steel sheet metal. The use of top insulating materials reduces energy consumption. Matter of course is perfect workshop processing, hardware and smooth and safe operation.

**Standard design of furnace:**
- Ht40 AL controller
- Stand with height setting
- Wheels (2pcs)

**Accessories for an additional charge:**
- Ht40 AL or Bentrup TC44 controller
- Desk for the bottom of the furnace
- Distance columns
- Calibration of the controller measuring entry

### 36 MONTHS WARRANTY

<table>
<thead>
<tr>
<th>Type LAC</th>
<th>Controller</th>
<th>Tmax</th>
<th>d</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 30/12</td>
<td>Ht40 AL</td>
<td>1280</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>M 45/12</td>
<td>Ht40 AL</td>
<td>1280</td>
<td>10</td>
<td>45</td>
</tr>
<tr>
<td>M 60/12</td>
<td>Ht40 AL</td>
<td>1280</td>
<td>10</td>
<td>60</td>
</tr>
<tr>
<td>M 100/12</td>
<td>Ht40 AL</td>
<td>1280</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>M 125/12</td>
<td>Ht40 AL</td>
<td>1280</td>
<td>10</td>
<td>125</td>
</tr>
<tr>
<td>M 200/12</td>
<td>Ht40 AL</td>
<td>1280</td>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td>M 30/13</td>
<td>Ht40 AL</td>
<td>1340</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>M 45/13</td>
<td>Ht40 AL</td>
<td>1340</td>
<td>10</td>
<td>45</td>
</tr>
<tr>
<td>M 60/13</td>
<td>Ht40 AL</td>
<td>1340</td>
<td>10</td>
<td>60</td>
</tr>
<tr>
<td>M 100/13</td>
<td>Ht40 AL</td>
<td>1340</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>M 125/13</td>
<td>Ht40 AL</td>
<td>1340</td>
<td>10</td>
<td>125</td>
</tr>
<tr>
<td>M 200/13</td>
<td>Ht40 AL</td>
<td>1340</td>
<td>10</td>
<td>200</td>
</tr>
</tbody>
</table>

* *proportions of the cylindrical furnace body with the lid*
These furnaces are suitable especially for all "hobby" production of bended and sintered glass also for fusing glass treatment. Can be apply both for artistic and industrial production depending on accessories and size. The shape and design ensures a perfect temperature distribution and possibility of fast rise to desired temperature. Furnace shell is made of polished stainless steel sheet metal. The use of top insulating materials reduces energy consumption. Matter of course is perfect workshop processing, hardware and smooth and safe operation.

Standard design of furnace:
- H40 AL controller
- Stand with height setting
- Wheels (2pcs)

Accessories for an additional charge:
- H40 AL or Bentrup TC44 controller
- Desk for the bottom of the furnace
- Distance columns
- Calibration of the controller measuring entry

36 MONTHS WARRANTY

<table>
<thead>
<tr>
<th>Type LAC</th>
<th>Controller</th>
<th>Tmax</th>
<th>Volume</th>
<th>External dimensions</th>
<th>Internal dimensions</th>
<th>Input</th>
<th>Weight</th>
<th>Total height of stand</th>
<th>Voltage</th>
<th>Furnace protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGF 30/90</td>
<td>H40 AL</td>
<td>900</td>
<td>30</td>
<td>615x420</td>
<td>410x265</td>
<td>3</td>
<td>65</td>
<td>565, 725</td>
<td>230</td>
<td>16/1</td>
</tr>
</tbody>
</table>

*proportions of the cylindrical furnace body with the lid
These furnaces are used for firing of the decorative and industrial ceramic, the glass heat treatment and the decoration in higher volume in ceramic and glass industries especially. The shape and design ensures a perfect temperature distribution and possibility of fast rise to desired temperature. Furnace shell is made of polished stainless steel sheet metal. The use of top insulating materials reduces energy consumption. Matter of course is perfect workshop processing, hardware and smooth and safe operation.

Standard design of furnace:
- Ht40 AL controller
- Without stand
- Ventilation chimney (on the ceiling)
- Slider for air supply control
- One-hand operation

Accessories for an additional charge:
- Ht Ceramic controller
- Stand
- Furnace superstructure for charge drying before setting it in the furnace
- Furnace bottom plate
- Calibration of the controller measuring entry

36 MONTHS WARRANTY
ALL METAL PARTS MADE OF STAINLESS STEEL METAL

<table>
<thead>
<tr>
<th>Type LAC</th>
<th>Controller</th>
<th>Tmax °C</th>
<th>Number of heating coils</th>
<th>Volume l</th>
<th>External dimensions (lxwxh) mm</th>
<th>Internal dimensions (lxwxh) mm</th>
<th>Input kW</th>
<th>Weight kg</th>
<th>Voltage V</th>
<th>Furnace protection Width for handling mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>KE 125/12</td>
<td>Ht40 AL</td>
<td>1280</td>
<td>3/5</td>
<td>125</td>
<td>910x910x1040</td>
<td>910x910x1040</td>
<td>9</td>
<td>100</td>
<td>400</td>
<td>16/3</td>
</tr>
<tr>
<td>KE 250/12</td>
<td>Ht40 AL</td>
<td>1280</td>
<td>3/5</td>
<td>275</td>
<td>1060x1060x1190</td>
<td>1060x1060x1190</td>
<td>14</td>
<td>260</td>
<td>400</td>
<td>25/3</td>
</tr>
<tr>
<td>KE 500/12</td>
<td>Ht40 AL</td>
<td>1280</td>
<td>3/5</td>
<td>504</td>
<td>1110x1220x1450</td>
<td>1110x1220x1450</td>
<td>19</td>
<td>390</td>
<td>400</td>
<td>32/3</td>
</tr>
</tbody>
</table>

*after dismounting the regulator and the door closing mechanism
CHAMBER FURNACES K

These furnaces are used for firing of the decorative and industrial ceramic, the glass heat treatment and the decoration in higher volume in ceramic and glass industries especially. The shape and design ensure a perfect temperature distribution and possibility of fast rise to desired temperature. Furnace has a robust steel construction, stable door suspension and aeration which prevent condensation during firing (rust reduction). Furnace shell is made of polished stainless steel sheet metal. The use of top insulating materials reduces energy consumption. Matter of course is perfect workshop processing, hardware and smooth and safe operation.

Standard design of furnace:
- Ht Ceramic controller
- Hand operated left side opened door
- Manually controlled ventilation flap
- Stand for K 50 – K 300

Accessories for an additional charge:
- INDUSTRY controller
- Atypical stand for K 50 – K 300
- Automatic ventilation flap
- Right side door opening
- Pressure cooling
- Calibration of the controller measuring entry
- Interface RS232 or RS485
- Set HtMonit (includes interface + software)

36 MONTHS WARRANTY

<table>
<thead>
<tr>
<th>Type LAC</th>
<th>Controller</th>
<th>Tmax °C</th>
<th>Volume l</th>
<th>External dimensions (šxvxh) mm</th>
<th>Internal dimensions (šxvxh) mm</th>
<th>Input kW</th>
<th>Weight kg</th>
<th>Voltage V</th>
<th>Furnace protection Max floor load capacity kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>K 50/13</td>
<td>Ht Ceramic</td>
<td>1300</td>
<td>50</td>
<td>910x1405x1070</td>
<td>350x350x400</td>
<td>5.5</td>
<td>125</td>
<td>400</td>
<td>16/3 50</td>
</tr>
<tr>
<td>K 70/13</td>
<td>Ht Ceramic</td>
<td>1300</td>
<td>80</td>
<td>910x1465x1070</td>
<td>350x450x450</td>
<td>7.5</td>
<td>165</td>
<td>400</td>
<td>16/3 50</td>
</tr>
<tr>
<td>K 120/13</td>
<td>Ht Ceramic</td>
<td>1340</td>
<td>120</td>
<td>1010x1535x1140</td>
<td>450x530x500</td>
<td>10.5</td>
<td>260</td>
<td>400</td>
<td>16/3 80</td>
</tr>
<tr>
<td>K 150/13</td>
<td>Ht Ceramic</td>
<td>1340</td>
<td>150</td>
<td>1010x1620x1160</td>
<td>450x600x530</td>
<td>15</td>
<td>320</td>
<td>400</td>
<td>25/3 80</td>
</tr>
<tr>
<td>K 200/13</td>
<td>Ht Ceramic</td>
<td>1340</td>
<td>200</td>
<td>1060x1800x1105</td>
<td>500x750x530</td>
<td>20</td>
<td>360</td>
<td>400</td>
<td>40/3 120</td>
</tr>
<tr>
<td>K 250/13</td>
<td>Ht Ceramic</td>
<td>1340</td>
<td>230</td>
<td>1090x1800x1230</td>
<td>520x800x550</td>
<td>23</td>
<td>420</td>
<td>400</td>
<td>40/3 120</td>
</tr>
<tr>
<td>K 300/13</td>
<td>Ht Ceramic</td>
<td>1340</td>
<td>310</td>
<td>1105x1820x1340</td>
<td>560x800x710</td>
<td>27</td>
<td>480</td>
<td>400</td>
<td>63/3 200</td>
</tr>
<tr>
<td>K 500/13</td>
<td>Ht Ceramic</td>
<td>1340</td>
<td>490</td>
<td>1460x1825x1460</td>
<td>650x1000x750</td>
<td>40</td>
<td>770</td>
<td>400</td>
<td>80/3 300</td>
</tr>
<tr>
<td>K 700/13</td>
<td>Ht Ceramic</td>
<td>1340</td>
<td>730</td>
<td>1550x1925x1610</td>
<td>750x1100x900</td>
<td>60</td>
<td>990</td>
<td>400</td>
<td>100/3 400</td>
</tr>
<tr>
<td>K 1000/13</td>
<td>Ht Ceramic</td>
<td>1340</td>
<td>1000</td>
<td>1570x2120x1775</td>
<td>800x1263x1000</td>
<td>75</td>
<td>2300</td>
<td>400</td>
<td>125/3 500</td>
</tr>
<tr>
<td>K 1500/13</td>
<td>Ht Ceramic</td>
<td>1340</td>
<td>1540</td>
<td>1800x2300x2050</td>
<td>950x1350x1200</td>
<td>110</td>
<td>2950</td>
<td>400</td>
<td>200/3 1800</td>
</tr>
<tr>
<td>K 2000/13</td>
<td>Ht Ceramic</td>
<td>1340</td>
<td>2100</td>
<td>2150x2500x2450</td>
<td>1000x1500x1400</td>
<td>130</td>
<td>3300</td>
<td>400</td>
<td>250/3 1000</td>
</tr>
<tr>
<td>K 120/14</td>
<td>Ht Ceramic</td>
<td>1400</td>
<td>120</td>
<td>1010x1535x1140</td>
<td>450x530x500</td>
<td>10.5</td>
<td>230</td>
<td>400</td>
<td>16/3 80</td>
</tr>
<tr>
<td>K 150/14</td>
<td>Ht Ceramic</td>
<td>1400</td>
<td>150</td>
<td>1010x1620x1160</td>
<td>450x600x530</td>
<td>15</td>
<td>280</td>
<td>400</td>
<td>25/3 80</td>
</tr>
<tr>
<td>K 200/14</td>
<td>Ht Ceramic</td>
<td>1400</td>
<td>200</td>
<td>1060x1800x1105</td>
<td>500x750x530</td>
<td>20</td>
<td>310</td>
<td>400</td>
<td>40/3 120</td>
</tr>
<tr>
<td>K 250/14</td>
<td>Ht Ceramic</td>
<td>1400</td>
<td>230</td>
<td>1090x1800x1230</td>
<td>520x800x550</td>
<td>23</td>
<td>360</td>
<td>400</td>
<td>40/3 120</td>
</tr>
<tr>
<td>K 300/14</td>
<td>Ht Ceramic</td>
<td>1400</td>
<td>310</td>
<td>1105x1820x1340</td>
<td>560x800x710</td>
<td>27</td>
<td>420</td>
<td>400</td>
<td>63/3 200</td>
</tr>
<tr>
<td>K 500/14</td>
<td>Ht Ceramic</td>
<td>1400</td>
<td>490</td>
<td>1460x1825x1460</td>
<td>650x1000x750</td>
<td>40</td>
<td>700</td>
<td>400</td>
<td>80/3 300</td>
</tr>
<tr>
<td>K 700/14</td>
<td>Ht Ceramic</td>
<td>1400</td>
<td>730</td>
<td>1550x1925x1610</td>
<td>750x1100x900</td>
<td>60</td>
<td>920</td>
<td>400</td>
<td>100/3 400</td>
</tr>
<tr>
<td>K 1000/14</td>
<td>Ht Ceramic</td>
<td>1400</td>
<td>1000</td>
<td>1570x2120x1775</td>
<td>800x1263x1000</td>
<td>75</td>
<td>2100</td>
<td>400</td>
<td>125/3 500</td>
</tr>
<tr>
<td>K 1500/14</td>
<td>Ht Ceramic</td>
<td>1400</td>
<td>1540</td>
<td>1800x2300x2050</td>
<td>950x1350x1200</td>
<td>110</td>
<td>2600</td>
<td>400</td>
<td>200/3 1800</td>
</tr>
<tr>
<td>K 2000/14</td>
<td>Ht Ceramic</td>
<td>1400</td>
<td>2100</td>
<td>2150x2500x2450</td>
<td>1000x1500x1400</td>
<td>130</td>
<td>3200</td>
<td>400</td>
<td>250/3 1000</td>
</tr>
</tbody>
</table>

Technical changes reserved
These furnaces are suitable for all 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:**
- H140 AL or 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
- Airing chimney on the back part of the furnace
- Supply cable fitted with single-phase plug
- Thermocouple Type “S”
- Solid state relay

**Accessories for an additional charge:**
- Injector with an exhaust fan and draft diverter
- Plate for furnace bottom
- Protection atmosphere inlet
- Calibration of the controller measuring entry
- Interface RS232 or RS485
- Set HMonit (includes interface + software)
<table>
<thead>
<tr>
<th>Type LAC</th>
<th>Controller</th>
<th>Tmax</th>
<th>Volume</th>
<th>External dimensions</th>
<th>Internal dimensions</th>
<th>Input</th>
<th>Weight</th>
<th>Voltage</th>
<th>Furnace protection</th>
<th>Max floor load capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>L 03/12</td>
<td>HR40 AL</td>
<td>1200</td>
<td>3</td>
<td>380x440x400</td>
<td>180x100x140</td>
<td>1.2</td>
<td>21</td>
<td>230</td>
<td>16/1</td>
<td>4</td>
</tr>
<tr>
<td>L 05/12</td>
<td>HR40 AL</td>
<td>1200</td>
<td>5</td>
<td>430x470x430</td>
<td>230x130x170</td>
<td>2.4</td>
<td>26</td>
<td>230</td>
<td>16/1</td>
<td>6</td>
</tr>
<tr>
<td>L 09/12</td>
<td>HR40 AL</td>
<td>1200</td>
<td>9</td>
<td>430x505x500</td>
<td>230x170x240</td>
<td>3</td>
<td>32</td>
<td>230</td>
<td>16/1</td>
<td>6</td>
</tr>
<tr>
<td>L 15/12</td>
<td>HR40 AL</td>
<td>1200</td>
<td>15</td>
<td>450x505x600</td>
<td>250x170x340</td>
<td>3.5</td>
<td>39</td>
<td>230</td>
<td>16/1</td>
<td>6</td>
</tr>
<tr>
<td>L 03/12</td>
<td>INDUSTRY</td>
<td>1200</td>
<td>3</td>
<td>380x440x400</td>
<td>180x100x140</td>
<td>1.2</td>
<td>21</td>
<td>230</td>
<td>16/1</td>
<td>4</td>
</tr>
<tr>
<td>L 05/12</td>
<td>INDUSTRY</td>
<td>1200</td>
<td>5</td>
<td>430x470x430</td>
<td>230x130x170</td>
<td>2.4</td>
<td>26</td>
<td>230</td>
<td>16/1</td>
<td>6</td>
</tr>
<tr>
<td>L 09/12</td>
<td>INDUSTRY</td>
<td>1200</td>
<td>9</td>
<td>430x505x500</td>
<td>230x170x240</td>
<td>3</td>
<td>32</td>
<td>230</td>
<td>16/1</td>
<td>6</td>
</tr>
<tr>
<td>L 15/12</td>
<td>INDUSTRY</td>
<td>1200</td>
<td>15</td>
<td>450x505x600</td>
<td>250x170x340</td>
<td>3.5</td>
<td>39</td>
<td>230</td>
<td>16/1</td>
<td>6</td>
</tr>
</tbody>
</table>

Technical changes reserved
These furnaces are designed for all professional ceramists, production plants, firing of ceramics, earthenware, glasses, porcelain or decorating. They have a stable door suspension. Dislocation of heating elements ensures excellently equal temperature distribution inside the furnace. The use of top insulating materials reduces energy consumption. Matter of course is perfect workshop processing, hardware and smooth and safe operation.

Standard design of furnace:
- INDUSTRY controller with the limit unit Ht40B
- Bogie with the metal wheels coated by the vulcanite for undercarriage on the floor
- Lever mechanism for lowering operating force when inserting boogie
- Manually operated ventilation flap
- Door is opening manually on „C” hangings to the left side
- Solid state relay – SSR
- Heated bogie
- Optimization of the temperature field to fulfill DIN 17052-1 ΔT 20°C in the internal usable space (in the empty furnace at Tmax)

Accessories for an additional charge:
- Rails of length equal to the 2,5 multiple furnace length installed on the floor
- Second bogie manually or electrically driven
- Electric drive bogie
- Metal plates on the desktop of the bogie to the temperature 90°C, i.e. only for the type VKT xxx/09
- Ammeters for checking heating elements conditions
- Pressure cooling
- Automatic ventilation flap
- Lining from the fireproof bricks and the refractory concrete portal
- Doors opening up
- Second door — model with possibility of inserting boogie from both sides
- Exhaust combustion chamber
- Machine installation (for correct installation we recommend to put machine into operation by LAC specialist)
- Graphic temperature recorder
- Calibration of the controller measuring entry
- Interface RS232 or RS485
- Set HtMonit (includes interface + software)

<table>
<thead>
<tr>
<th>Type LAC</th>
<th>Controller</th>
<th>Tmax °C</th>
<th>Volume l</th>
<th>External dimensions (xxyxh) mm</th>
<th>Internal dimensions (xxyxh) mm</th>
<th>Input kW</th>
<th>Weight kg</th>
<th>Voltage V</th>
<th>Furnace protection</th>
<th>Max tonnage kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>VKK 1000/12</td>
<td>INDUSTRY</td>
<td>1280</td>
<td>1170</td>
<td>2250x2000x2350</td>
<td>1000x900x1300</td>
<td>45</td>
<td>1500</td>
<td>400</td>
<td>80/30</td>
<td>2000</td>
</tr>
<tr>
<td>VKK 1500/12</td>
<td>INDUSTRY</td>
<td>1500</td>
<td>2250x2000x2550</td>
<td>1000x1000x1500</td>
<td>70</td>
<td>1800</td>
<td>400</td>
<td>125/3</td>
<td>3500</td>
<td></td>
</tr>
<tr>
<td>VKK 2000/12</td>
<td>INDUSTRY</td>
<td>2000</td>
<td>2250x2100x2300</td>
<td>1000x1000x2000</td>
<td>95</td>
<td>2200</td>
<td>400</td>
<td>160/3</td>
<td>3500</td>
<td></td>
</tr>
<tr>
<td>VKK 3000/12</td>
<td>INDUSTRY</td>
<td>3025</td>
<td>2400x2000x3600</td>
<td>1100x1100x2500</td>
<td>130</td>
<td>2500</td>
<td>400</td>
<td>250/3</td>
<td>4500</td>
<td></td>
</tr>
<tr>
<td>VKK 5000/12</td>
<td>INDUSTRY</td>
<td>5000</td>
<td>2400x2500x4400</td>
<td>1100x1400x3300</td>
<td>160</td>
<td>3200</td>
<td>400</td>
<td>250/3</td>
<td>5000</td>
<td></td>
</tr>
<tr>
<td>VKK 7000/12</td>
<td>INDUSTRY</td>
<td>7084</td>
<td>2400x2500x5800</td>
<td>1100x1400x4600</td>
<td>195</td>
<td>4000</td>
<td>400</td>
<td>300/3</td>
<td>8000</td>
<td></td>
</tr>
<tr>
<td>VKK 1000/13</td>
<td>INDUSTRY</td>
<td>1340</td>
<td>1170</td>
<td>2250x2000x2350</td>
<td>650x1000x750</td>
<td>65</td>
<td>1500</td>
<td>400</td>
<td>125/3</td>
<td>2000</td>
</tr>
<tr>
<td>VKK 1500/13</td>
<td>INDUSTRY</td>
<td>1340</td>
<td>1500</td>
<td>2250x2100x2550</td>
<td>1000x900x1300</td>
<td>95</td>
<td>1800</td>
<td>400</td>
<td>160/3</td>
<td>3500</td>
</tr>
<tr>
<td>VKK 2000/13</td>
<td>INDUSTRY</td>
<td>1340</td>
<td>2000</td>
<td>2250x2100x3100</td>
<td>1000x1000x1500</td>
<td>115</td>
<td>2200</td>
<td>400</td>
<td>200/3</td>
<td>3500</td>
</tr>
<tr>
<td>VKK 3000/13</td>
<td>INDUSTRY</td>
<td>1340</td>
<td>3025</td>
<td>2400x2200x3600</td>
<td>1100x1100x2500</td>
<td>160</td>
<td>2500</td>
<td>400</td>
<td>250/3</td>
<td>4500</td>
</tr>
<tr>
<td>VKK 5000/13</td>
<td>INDUSTRY</td>
<td>1340</td>
<td>5000</td>
<td>2400x2500x4400</td>
<td>1100x1400x3300</td>
<td>200</td>
<td>3200</td>
<td>400</td>
<td>300/3</td>
<td>5000</td>
</tr>
<tr>
<td>VKK 7000/13</td>
<td>INDUSTRY</td>
<td>1340</td>
<td>7084</td>
<td>2400x2500x5800</td>
<td>1100x1400x4600</td>
<td>265</td>
<td>4000</td>
<td>400</td>
<td>400/3</td>
<td>8000</td>
</tr>
</tbody>
</table>

Technical changes reserved
FIRING AIDS

There are various firing aids available which serves for better utilisation of the internal furnace space.

INTERLAYER PLATES AND DISTANCE POLES
Particularly interlayer plates are used to protect the furnace bottom or as interlayer plates for firing on multiple floors (cordierite-mullite material). Distance poles are used to build the floors. We can supply these aids in various standardized sizes but also in dimensions on request. Interlaying crosses are intended for specific charge position.

WARNING
New and unused interlaying plates must be dried before first firing. Temperature in furnace for this purpose should achieve 350 °C for approx. three and a half hours. After this process which protects the plate from cracking, it is possible to use the plates routinely.
TEMPERATURE CONTROLLERS

Electric resistance furnaces manufactured by LAC Ltd. are fitted with the following types of high-quality PID controllers: Ht40 AL, Ht Ceramic or INDUSTRY. These types of controllers are microprocessor-controlled devices meeting all the requirements for temperature control and the security of electro-thermal devices. On request can be some types of furnaces fitted with Bentrup TC 44 regulators.

Temperature controller Ht40 AL
- The device allows the controlling of the temperature to a constant value or by the program (1 program)
- The regulation to a constant value can be disabled
- The program can be launched with a defined time delay
- Measurement accuracy of ± 0.1% from the measuring scope (min. 540 °C), regulation accuracy of ± 1 °C
- One auxiliary output for controlling an additional function – end of program signal, program operation signal, end of program signal
- Configurable alarm output (limit temperature monitoring)
- The controller can be equipped with a RS232 or RS485 serial communication line
- The device can be connected to a PC using the series communication line, and the course of the measured and desired temperatures can be displayed on a PC using the HtMonit software (the temperature course can be stored in the memory of a PC)
- Automatic setup of the PID parameters of the control loop

Temperature controller Ht Ceramic
- Program controller designed for controlling of complex technological devices—can be equipped with one input, two control outputs and one alarm output
- Device allows temperature control to constant value or according to the program (up to 20 programs)
- Easy operation
- Real time clock (program starts at the programmed time)
- Regulation accuracy of ± 1 °C
- Optional connection to PC using the RS232 or RS485 interface
- Optional modification of parameter settings during the program
The INDUSTRY Temperature Controller

- Program controller designed for controlling of complex technological devices—can be equipped with one input, two control outputs, four slave outputs and one alarm output
- Device allows temperature control to constant value or according to the program (up to 30 programs); programs can be connected by using the JuMP step
- Easy operation
- Real time clock (program starts at the programmed time)
- Regulation accuracy of ±1 °C
- Optional connection to PC using the RS232 or RS485 interface
- Optional fitting with two communication lines (connect to PC and control of subordinate controllers simultaneously, so-called MASTER – SLAVE)
- Optional modification of parameter settings during the program
- Recording of measured values (datalogger), up to 4000 records

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 INDUSTRY controller profiles
- Start or end programs
DESCRIPTION OF ACCESSORIES

CALIBRATION OF THE CONTROLLER MEASURING ENTRY
Issue of a calibration certificate which defines 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 to the controller from thermocouple reflecting the deviation of all elements used in measuring system.

SOLID STATE RELAY - SSR
To control the furnace power are used the switching elements which contain no moving parts which can be wear out by frequent switching and also make noise.

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.

GRAPHIC TEMPERATURE RECORDER
Device located in the control panel of the furnace which records the temperature in the furnace according to the time on a paper strip.

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 information detected by furnace measuring. These adjustments lead to optimization of temperature distribution in furnace; alternatively the furnace can be tune for specific charge.
COOLING

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

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

MANUALLY CONTROLLED VENTILATION FLAP
Ventilation, opening or closing the flap is controlled manually.

AUTOMATIC VENTILATION FLAP
Ventilation the furnace innerspace, opening or closing the flap is controlled by controller. It can be combined only with INDUSTRY controller.

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.

PRESSURE COOLING
Active cooling of the charge. To the bottom of the furnace through the flap is blown cool air that goes through an automatic ventilation flap from the furnace space. Starting the fan and opening the flaps controls the controller according to the furnace cooling speed adjustment. It can be combined only with the INDUSTRY controller.

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.

PROTECTION ATMOSPHERE

PROTECTION ATMOSPHERE INLET
Preparation of the furnace for a supply of the protective atmosphere into the furnace workspace ended by hosepipe input on the side of the furnace. In smaller furnaces, about 550 liters volume, bottle reducing valve with a flow meter is part of the supply. Inlet can be supplemented by automatically controlled solenoid valve – can be combined only with the INDUSTRY controller.
HEADQUARTERS:
LAC, Ltd.  phone: +420 547 230 016
Stefanikova 116  fax: +420 547 230 212
664 61 Rajhrad  info@lac.cz
Czech Republic  www.lac.cz

SUBSIDIARY – MANUFACTURE OF INDUSTRIAL FURNACES AND DRYERS
LAC, Ltd.  phone: +420 547 231 312
Jirího z Podebrad 26  fax: +420 547 230 212
664 62 Hrusovany u Brna  info@lac.cz
Czech Republic  www.lac.cz

SUBSIDIARY – MANUFACTURE OF REFRACTORY CASTABLE SHAPES
LAC, Ltd.  phone: +420 515 238 211
Drnholec 522  fax: +420 515 229 696
671 67 Hrusovany nad Jevíškovou  info@lac.cz
Czech Republic  www.lac.cz