

## SPECIFICATION EUCERK 144

### • THERMAL UNIT

The thermal unit must be composed of:

Blown air modulating gas burner WEISHAUP T WG20 series, CE approved, maximum heat input 159.9 kW.

The burner must be complete of the following components:

- LCD display with managing panel, necessary to set and display the single program steps and the relating working status, as well as memorize incidental anomalies;
- Butterfly gas valve and air shutter, moved by servo controls with stepper motor, allowing an optimal combination of comburent air and gas in the whole regulation time;
- Ionization flame sensor, needed to control the flame indicator in any phase during operation; in case the flame signalling doesn't match the program sequence, the sensor blocks the system;
- Pressure stabilizer, necessary to compensate any fluctuation of the gas pressure in the supply net, so to keep the gas pressure and gas flow constant;
- Electromagnetic double valve in A class, needed to open and intercept the gas supply. Inlet pressure 20-300 mbar;
- Minimum pressure switch, with the function of starting a gas shortage program in case the pressure of the gas is too low, avoiding then the block of the burner;
- Air pressure switch, causing a block in case of interruption of the air flow.

The burner must be in compliance with the standards EN676, EN292, EN50 081-1, EN50 082-1 and EN60 335, as well as have a CE mark in compliance to the directives 90/396 CE, 89/336 CE, 73/23 CE, 92/42 CE and 98/37 CE.

COMBUSTION CHAMBER in AISI 310 stainless steel, thickness 30/10.

RECIRCULATION CHAMBER in AISI 316 stainless steel.

CENTRIFUGAL FAN with reverse blades in AISI 316 stainless steel, directly coupled to the motor. The impeller with diameter 315 mm has to be tested complying with DIN24163. The motor of the two-poles fan (2800 g/min) with protection degree IP55, must be able to be three-phase supplied at 380 V - 50 Hz.

ELECTRICAL PANEL on unit board, it must be made in steel sheet, painted with thermosetting epossidic powders with protection degree IP 55. The electrical panel must have a door lock switch.

The electrical panel must contain the following electric and electrical components:

- Microcontrol card with 9 inputs and 6 outputs for the management and control of the electromechanical organs of the combustion unit (regulation in modulation) by means of a data bus interface with climatic controller;
- Safety thermostat with fix setting at 245 °C at manual rearming;
- Adjustable working thermostat from 0 to 300 °C at automatic rearming;
- Adjustable modulation and anticondensate thermostat from 0 to 300 °C at automatic rearming;
- Adjustable post-ventilation thermostat from 0 to 300 °C at automatic rearming;
- Differential pressure switch for the continuous control of the suction pressure of the radiant circuit;
- Fuses, overload cutout and anything else necessary for the safe and proper working of the electro-mechanical elements part of the thermal unit;
- Internal 220-230 V socket for the electrical supply of the exhaust analysis equipment.

## DOUBLE PIPE RADIANT MODULES

The double pipe radiant module must be composed of a couple of radiant pipes with diameter 315 mm, and must be free to oscillate in the frame longitudinally to compensate the thermal expansion. The radiant pipelines must be made in aluminized steel treated at high temperature in controlled atmosphere, to obtain on the surface the highest radiant power and temperature homogeneity, with no use of paints.

The frame for support and containment of the radiant pipes, having a section measuring ab. 800x400 mm, must be totally composed of profiles in galvanized steel with rectangular section of minimum 50x30 mm, as well as be composed of a transversal structure constituted of a "L" profile measuring 50x50x2 mm.

Each radiant module measuring 6 meters, must be hanged up by means of 4 brackets in galvanized steel, free to run longitudinally, to adapt the brackets interaxis to the building structure.

The lateral and upper part of the radiant module must be insulated with white fibreglass, with inorganic binder, totally devoid of phenol and formaldehyde, coupled with aluminium sheets

Along the lateral part of the support and containment frame, must be fixed a cover in pre-painted steel sheet, colour white/grey, that has to be partially fretted for structural and aesthetical reasons.

- **FIRST DOUBLE PIPE RADIANT MODULE** **6 metres**
- **FIRST DOUBLE PIPE RADIANT MODULE** **3 metres**

- **STRAIGHT DOUBLE PIPE RADIANT MODULE** **6 metres**
- **STRAIGHT DOUBLE PIPE RADIANT MODULE** **3 metres**

- **DOUBLE PIPE RADIANT MODULE WITH H.T. JOINT** **6 metres**
- **DOUBLE PIPE RADIANT MODULE WITH H.T. JOINT** **3 metres**
- **DOUBLE PIPE RADIANT MODULE WITH JOINT** **6 metres**
- **DOUBLE PIPE RADIANT MODULE WITH JOINT** **3 metres**

The double pipe radiant module with joint must be equipped, in both tubes, with a dilatation joint in stainless steel with an internal telescopic element, sliding on rails and fixed with a seal ring suitable to resist the operating temperatures. In the radiant module with HT joint, the seal ring inserted in the telescopic joint must be able to resist the high temperatures generated nearby the burner.

- **DOUBLE PIPE RADIANT MODULE WITH ELBOW** **6 metres**
- **DOUBLE PIPE RADIANT MODULE WITH ELBOW** **3 metres**

The double pipe radiant module with elbow, in one end must be composed of right or left 90° elbows in both pipes.

- **DOUBLE PIPE RADIANT MODULE WITH DOUBLE ELBOW** **6 metres**

The double pipe radiant module with double elbow, must be composed in both ends and in both pipes of a 90° elbow.

- **"T" DOUBLE PIPE RADIANT MODULE** **6 metres**
- **"T" DOUBLE PIPE RADIANT MODULE** **3 metres**

The "T" double pipe radiant module must be equipped, in one tube and at a distance along the longitudinal axis that is variable and connected to the project requirements, two 90° mirror-like elbows, to allow the perpendicular connection to another module.

- **FINAL "T" DOUBLE PIPE RADIANT MODULE** **6 metres**
- **FINAL "T" DOUBLE PIPE RADIANT MODULE** **3 metres**

The final "T" double pipe radiant module must be composed, on the central point of a pipe of two 90° mirror-like elbows, to allow the perpendicular connection to another module. To both ends of the two pipes must be composed of a 180° elbow.

- **FINAL DOUBLE PIPE RADIANT MODULE** **6 metres**
- **FINAL DOUBLE PIPE RADIANT MODULE** **3 metres**  
 The double pipe radiant module must be composed of a 180° elbow at one end of both tubes.
  
- **SPECIAL STRAIGHT DOUBLE PIPE RADIANT MODULE** **from 0 to 3 metres**
- **SPECIAL STRAIGHT DOUBLE PIPE RADIANT MODULE** **from 3 to 6 metres**  
 The special straight double pipe radiant module must have a length vary on the project requirements.
  
- **STEP DOWN DOUBLE PIPE RADIANT MODULE** **from 0 to 3 metres**
- **STEP DOWN DOUBLE PIPE RADIANT MODULE** **from 3 to 6 metres**  
 The step down double pipe radiant module must be composed of elbows in both tubes, so to decrease or increase in height the terminal end of the module respect to the start part with a maximum angle of 45°.
  
- **“OMEGA” DOUBLE PIPE RADIANT MODULE** **from 0 to 3 metres**
- **“OMEGA” DOUBLE PIPE RADIANT MODULE** **from 3 to 6 metres**  
 The “omega” double pipe radiant module must be composed of elbows in both tubes, so to step over or pass under an obstacle with two passages in height of max. 45°. The start and end parts must be on the same horizontal axis.
  
- **LATERAL DEVIATION DOUBLE PIPE RADIANT MODULE** **from 0 to 3 metres**
- **LATERAL DEVIATION DOUBLE PIPE RADIANT MODULE** **from 3 to 6 metres**  
 The lateral deviation special double pipe radiant module must be composed of tubes with elbows, so to avoid an obstacle with deviations having max. 45°. The start and end parts must be on the same horizontal axis.

### **SINGLE PIPE RADIANT MODULES**

The single pipe radiant module must be composed of one radiant tube with diameter 315 mm, and must be free to oscillate in the frame longitudinally to compensate the thermal expansion. The radiant pipeline must be made in aluminized steel treated at high temperature in controlled atmosphere, to obtain on the surface the highest radiant power and temperature homogeneity, with no use of paints.

The frame for support and containment of the radiant pipes, having a section measuring ab. 480x400 mm, must be totally composed of profiles in galvanized steel with rectangular section of minimum 50x30 mm, as well as be composed of a transversal structure constituted of a “L” profile measuring 50x50x2 mm.

Each radiant module measuring 6 meters, must be hanged up by means of 4 brackets in galvanized steel, free to run longitudinally, to adapt the brackets interaxis to the building structure.

The lateral and upper part of the radiant module must be insulated with white fibreglass, with inorganic binder, totally devoid of phenol and formaldehyde, coupled with aluminium sheets

Along the lateral part of the support and containment frame, must be fixed a cover in pre-painted steel sheet, colour white/grey, that has to be partially fretted for structural and aesthetical reasons.

- **STRAIGHT SINGLE PIPE RADIANT MODULE** **6 metres**
- **STRAIGHT SINGLE PIPE RADIANT MODULE** **3 metres**
  
- **SINGLE PIPE RADIANT MODULE WITH H.T. JOINT** **6 metres**
- **SINGLE PIPE RADIANT MODULE WITH H.T. JOINT** **3 metres**
- **SINGLE PIPE RADIANT MODULE WITH JOINT** **6 metres**
- **SINGLE PIPE RADIANT MODULE WITH JOINT** **3 metres**  
 The single pipe radiant module with joint must be equipped, in both tubes, with a dilatation joint in stainless steel with an internal telescopic element, sliding on rails and fixed with a seal ring suitable to resist the operating temperatures. In the radiant module with HT joint, the seal ring inserted in the telescopic joint must be able to resist the high temperatures generated nearby the burner.

- **SINGLE PIPE RADIANT MODULE WITH ELBOW** **6 metres**
- **SINGLE PIPE RADIANT MODULE WITH ELBOW** **3 metres**  
 The single pipe radiant module with elbow, in one end must be composed of a right or left 90° elbow.
  
- **SINGLE PIPE RADIANT MODULE WITH DOUBLE ELBOW** **6 metres**  
 The single pipe radiant module with double elbow, in both ends must be composed of a 90° elbow.
  
- **“T” SINGLE PIPE RADIANT MODULE** **6 metres**
- **“T” SINGLE PIPE RADIANT MODULE** **3 metres**  
 The "T" single pipe radiant module must be equipped, in one tube and at a distance along the longitudinal axis that is variable and connected to the project requirements, two 90° mirror-like elbows, to allow the perpendicular connection to another module.
  
- **START LATERAL DEVIATION SINGLE PIPE RADIANT MODULE** **6 metres**
- **START LATERAL DEVIATION SINGLE PIPE RADIANT MODULE** **3 metres**  
 The start lateral deviation single pipe radiant module must be composed of a double tube module frame, with a straight tube and the other with a 90° elbow in one end, so to allow the passage from single to double pipe modules.
  
- **SPECIAL STRAIGHT SINGLE PIPE RADIANT MODULE** **from 0 to 3 metres**
- **SPECIAL STRAIGHT SINGLE PIPE RADIANT MODULE** **from 3 to 6 metres**  
 The special straight single pipe radiant module must have a length vary on the project requirements.
  
- **STEP DOWN SINGLE PIPE RADIANT MODULE** **from 0 to 3 metres**
- **STEP DOWN SINGLE PIPE RADIANT MODULE** **from 3 to 6 metres**  
 The step down single pipe radiant module must be composed of a tube with elbows, so to decrease or increase in height the terminal end of the module respect to the start part with a maximum angle of 45°.
  
- **“OMEGA” SINGLE PIPE RADIANT MODULE** **from 0 to 3 metres**
- **“OMEGA” SINGLE PIPE RADIANT MODULE** **from 3 to 6 metres**  
 The “omega” single pipe radiant module must be composed of a tube with elbows, so to step over or pass under an obstacle with two passages in height of max. 45°. The start and end parts must be on the same horizontal axis.
  
- **SPECIAL LATERAL DEVIATION SINGLE PIPE RADIANT MODULE** **from 0 to 3 metres**
- **SPECIAL LATERAL DEVIATION SINGLE PIPE RADIANT MODULE** **from 3 to 6 metres**  
 The special lateral deviation single pipe radiant module must be composed of a tube with elbows, so to avoid an obstacle with deviations having max. 45°. The start and end parts must be on the same horizontal axis.
  
- **SUPPORTING FRAME FOR COMBUSTION UNIT**  
 The supporting frame necessary to fix the thermal unit to vertical or horizontal surfaces of the building, must be composed of tubes with a 50x30 mm rectangular section and reinforcement profiles, welded one each other, in hot-dip galvanized steel.
  
- **EXTERNAL COVER FOR COMBUSTION UNIT**  
 The external cover necessary to protect the thermal unit from bad weather and from atmospheric agents, must be made in aluminium sheet, colour white/grey. The upper part of the external cover must have a hole to allow the exhaust and a short chimney pipe with conic cap for the intake of the comburent air from outside; the lower and lateral part must have air intakes. The front part of the external cover must be fixed with two plastic hinges, to be easily lifted and so allow a simply maintenance of the thermal unit.

## **EXHAUST PIPELINE FOR THERMAL UNIT**

The exhaust pipeline must be composed of single-tube combinable elements Ø 120 mm, in AISI 316 stainless steel with thickness 0,5 mm. The connection must be gauged with male/female expansion at triple-lip gasket.

The mechanical seal between the element must be guaranteed by closing clamps in stainless steel.

- **LINEAR ELEMENT - length 1000 mm**
- **LINEAR ELEMENT - length 500 mm**
- **CLOSING CLAMP IN STAINLESS STEEL**
- **WALL STIRRUP IN STAINLESS STEEL**
- **CHIMNEY ANGULAR IN STAINLESS STEEL**
- **TERMINAL ELEMENT FOR CHIMNEY WITH WIND CAP**

- **CLIMATIC CONTROLLER**

The climatic controller must be composed of a weekly digital thermostat, inserted in a plastic case with fixing holes on the bottom and closing of the cap with insulating screws. The climatic controller, totally programmable by the user, must be able to manage and control the combustion unit both in manual and in automatic operation, in connection to the regulation of the temperature until max 60 weekly hour steps. By means of a 2-lines LCD display, it must be able to display day, hours, minutes, live room temperature and set temperature, whilst by means of lights it must be able to be controlled the working status of the electro-mechanical components of the combustion unit. In absence of electrical supply, a lithium battery must be able to keep in memory the set programme.

- **CASE FOR CLIMATIC CONTROLLER**

The case for the climatic controller must have the box and the plate for cable inlet with gasket made in steel sheet, painted with thermal con with thermosetting epossidic powders. The door with transparent frame in Plexiglas, must have a lock with double-sided key. The electrical control panel with protection degree IP55 must be complete of screws for the earthing and wall fixing.

- **SENSOR PROBE**

The probe with black bulb and PTC sensor ( $R_0=2000$  ohm a  $25^{\circ}\text{C}$  not polarized) that detect the "internal working temperature" must be able to be connect to the electrical control panel of the combustion unit. The case supporting the sensor probe must be in plastic material with protection degree IP56 and must allow the wall fixing.

- **EXTERNAL SENSOR**

The external sensor with PTC sensor ( $R_0=2000$  ohm at  $25^{\circ}\text{C}$  not polarized) detecting the "external temperature", must be connected to the electrical control panel of the combustion unit. The case containing the external sensor must be made in plastic material with IP56 protection degree and allow the wall fixing.

## **MANAGEMENT SOFTWARE**

The management software, by means of a compatible PC, must be able to program the regulation of each single thermal unit with an infinite number of working intervals. The room temperature must be programmable and the operation of the thermal units must be optimized with a climatic regulation by means of 2 external sensors. The software must permit the graphic display the working variables of the whole system and of each single unit in real time or in relation to the time historical data. All the functions must be easily controlled by a standard alpha-numerical keyboard and/or mouse. The setting and the display of the working variables must be able to constantly be monitored remotely with the addition a modem.

- **MANAGEMENT SOFTWARE from 1 to 2 THERMAL UNIT**
- **MANAGEMENT SOFTWARE from 3 to 5 THERMAL UNIT**
- **MANAGEMENT SOFTWARE from 6 to 10 THERMAL UNIT**
- **MANAGEMENT SOFTWARE from 11 to 20 THERMAL UNIT**
- **MANAGEMENT SOFTWARE from 21 to 50 THERMAL UNIT**
- **MANAGEMENT SOFTWARE from 51 to 100 THERMAL UNIT**
- **CENTRAL UNIT FOR PERSONAL COMPUTER**  
The central unit for PC must be composed of a desktop PC with Windows 2000® or Windows XP® OS, of minimum one PCI slot available and display monitor.
- **INTERFACE CARD FOR PC**  
The interface card must have two PCI - RS422/485 16C650serial ports with DB9M connectors.
- **DATA BUS CABLE**  
The data bus cable must be a screened and twisted in pairs cable (Li-ycy 2x2x0.75)
- **REI120 PANELLING**  
The REI panel must have dimensions of 2000x1000x100 mm and have a metallic self-supporting structure, with inside rock wool making it in compliance with the homologation REI 120.
- **LANDING PLATFORM FOR MAINTENANCE**  
The landing platform for maintenance must have a walkable surface in steel with reliefs of ab. 1700x1400 mm, with two trapdoors complete with cap with dimensions 500x500 mm. The outside sides of the platform must have a protection banister high 1000 mm. The maintenance platform must be made with rectangular profiles and hot-dip galvanized steel sheets.
- **STAIRCASE WITH PROTECTION - LENGTH 2000 mm**  
The staircase with protection is necessary to reach the landing platform in case of maintenance, it must have four stirrups for the wall fixing and be made in hot-dip galvanized steel.
- **TRAPDOOR FOR STAIRCASE**  
The trapdoor for staircase must be totally made in hot-dip galvanized steel.

- **EXTERNAL AIR INTAKE KIT FOR THERMAL UNIT**

The external air intake kit must be supplied by the manufacturer of the burner and used only when the installation of the thermal unit is inside the building.

- **LOWER PROTECTION FOR DOUBLE PIPE MODULE**

- **LOWER PROTECTION FOR SINGLE TUBE MODULE**

The lower protection, necessary to shield specific parts of the building structure from the radiance coming from the radiant pipes, must have a length of 1000 mm and be made in aluminium sheet.

- **LOWER PROTECTION FOR DOUBLE PIPE MODULE WITH INSULATION**

- **LOWER PROTECTION FOR SINGLE TUBE MODULE WITH INSULATION**

The lower protection, necessary to shield specific parts of the building structure from the radiance coming from the radiant pipes, must have a length of 1000 mm and be made in pre-painted steel sheet with a 40 mm thickness felt insulation.

- **LATERAL REFLECTOR KIT**

The lateral reflector kit, necessary to reflect the radiance and then deviate the radiant cone towards the desired zone, must be composed of a special shaped mirror-finished aluminium sheet having length 2000mm, complete of supporting strap and joint.