# TECHNICAL SPECIFICATION FOR SUPPLY AND INSTALLATION OF HEATING ELEMENTS AND SPARE PARTS FOR REGENERATIVE AIR PREHEATER ON UNIT 6

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Actual specification includes **6** pages

## 1. OBJECTIVE

This specification includes minimal requirements for scope of supply and installation of heating elements for Ljungström Air Preheater (RAPH) on Unit 6 of thermal power plant Šoštanj.

## 2. BACKGROUND

The Ljungström regenerative air preheater (RAPH) is a regenerative heat exchanger with a rotating heat transfer surface. The rotor with the installed heating elements (heat storage mass) rotates continuously inside a housing. Air and flue gas flows are separated from each other by means of seals.

The hot flue gas coming from the boiler enters the RAPH through the flue gas duct and imparts heat to the heating elements of the turning rotor. The combustion air transported via the FD fan enters the RAPH through the air duct and reabsorbs the heat stored in the heating elements. This heat exchange is a continuous process for the recovery of the heat stored in the flue gas and thus contributes to an economic boiler operation. The air preheater works based on the counterflow principle. The flue gas inlet and the air outlet side is called "hot side" whereas the flue gas outlet and the air inlet side is referred to as the "cold side" of the RAPH.

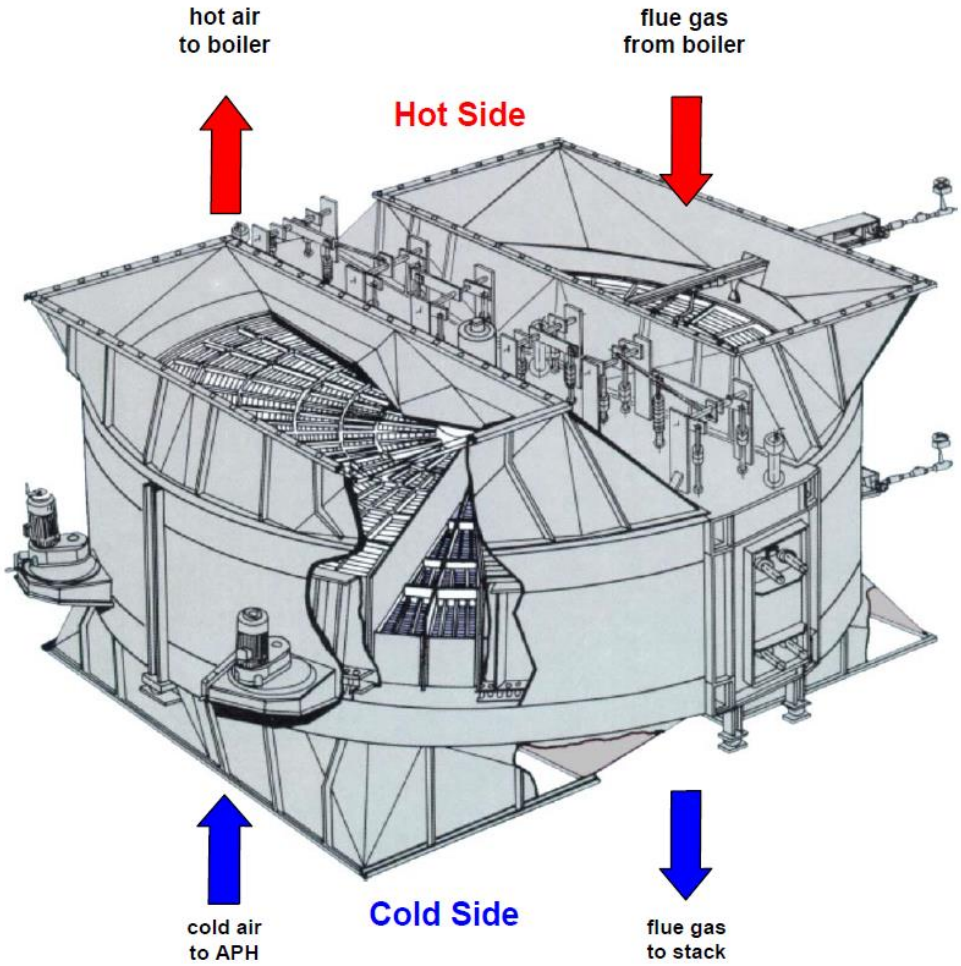


*Figure 1: The Ljungström regenerative air preheater (RAPH) type LCVZB 31,5/1800.*

**The tender comprises three separate lots (for two RAPH):**

**LOT 1:** Supply of the heating elements cold end and intermediate layer for all 5 rings on both RAPH.

**LOT 2:** Supervision service during the installation of heating elements and revision, cold and hot commissioning after revision.

**LOT 3:** Supply of spare parts for revision.

## 3. SCOPE OF SUPPLY

**a) Heating elements – replacement of the intermediate and cold end layer (LOT 1).**

Layer 1 (Cold Side, bottom):

| | |
|---|---|
| Type of element | Type DUN |
| Heat transfer surface / APH (projected) | 5.634 m² |
| Base material | 1.8961 |
| Plate thickness | 1,00 mm |
| Height of layer | 300 mm |
| Container material | 1.8965 |
| Number of containers | 216 pcs. |

Layer 2 (Intermediate Layer):

| | |
|---|---|
| Type of element | Type DU |
| Heat transfer surface / APH (projected) | 18.461 m² |
| Base material | St 12.03 |
| Plate thickness (without enamel) | 0,50 mm |
| Height of layer | 750 mm |
| Container material | 1.0038 |
| Number of containers | 216 pcs. |

**b) Spare parts for 2 RAPH (LOT 3):**

- Set of secondary seals for radial sealing system,
- Set of secondary seals for axial sealing system,
- Set of secondary seals for circumferential sealing system,
- Gear rim for rotor drive unit (2 per one RAPH),
- Rotor pins.

**IMPORTANT!**

**Required heating elements must be compatible to SCR Denox reactor which is installed in Thermal powerplant Šoštanj.**

**The contractor must have appropriate and original workshop drawings of air preheater interior-i.e., rotor assembly including all supports for heating elements and heating elements for all three layers.**

**Corrosion protection**

The baskets must be covered with temporary corrosion protection or under special conservation for minimum 6 months of the date of the delivery.

## 4. SCOPE OF SERVICES

**Supervision service (LOT 2)**

During assembly works and revision the supplier must provide supervisor to guide local personnel. All special tools needed to perform the intended erection work must be provided by contractor (hydraulic units for lifting the heating elements, hydraulic unit for turning the rotor when the main drives are out of service, etc.).

**Cold and hot commissioning (LOT 2)**

After finishing of the erection work cold and hot commissioning must be done to set sealing plates and ensure that all operating parameters are according to designed operation (check the tender attachment).

## 5. PROVIDER REFERENCES

The client requires three purchases and installation of heating elements with spare parts in the last five (5) years. Each reference must be verified by the provider's client.

## 6. WARRANTY

In the case of deviation from guaranteed performance poor quality and application of inadequate material, the manufacturer or distributor must immediately approach to remedy the deficiencies or deliver adequate new part of the relevant material (within 2 months). The cost of correcting shortcomings borne by the manufacturer or distributor.

The warranty period for supplied heating elements and spare parts is minimum 8000 operating hours or 24 months after delivery date.

For the parts which will be replaced during the warranty period the new warranty period has to be minimum 36 months after the original equipment delivery date.

## 7. ATTACHMENTS

- rotor.pdf
- RAPH unit 6 operation and technical data.pdf