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TECHNICAL SPECIFICATION

Doc No: DSF-SPC-MEC-014

Rev. 1

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HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

BOILERS

JUNE 2021

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REVISION HISTORICAL SHEET

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1. SCOPE

1.1 GENERAL

This Specification covers the minimum requirements for the design, fabrication and supply of boilers. Boilers are usually used for heating installations of natural gas combined with burner systems, at Metering and Regulating Stations in the Greek Natural Gas Transmission System.

1.2 ADDITIONAL INFORMATION

Additional information may be given in the project's requirements, basic design documents and drawings, and should be read in conjunction with this Technical Specification.

Any conflict between requirements of this Technical Specification, basic design documents and drawings, Standards, Material Requisition and Datasheet shall be referred to Owner for clarification before proceeding with fabrication of the subject part.

2. REFERENCES

Items/equipment to be supplied under this Specification shall comply with the requirements of the latest edition of the Codes, Standards, Specifications and Practices as applicable, except if specifically, modified hereafter:

2.1 REFERENCE DOCUMENTS

- Technical Specification DSF-SPC-MEC-013 [Burners]
- Technical Specification DSF-SPC-QAC-003 [Noise control]

2.2 REFERENCE CODES AND STANDARDS

- 2014/68/EU [Pressure Equipment Directive (PED) of the European Parliament and of the Council of 15 May 2014 on the harmonization of the laws of the Member States relating to the making available on the market of pressure equipment Text with EEA relevance]
- B.Δ. 277/63



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(ΦΕΚ 65Α/1963)

[Περί ατμολεβήτων, εγκαταστάσεως και λειτουργίας αυτών]

- ELOT EN 10216-2 [Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 2: Non alloy and alloy steel tubes with specified elevated temperature properties]
- ELOT EN 1561 [Founding - Grey cast irons]
- ELOT EN 12952-8 [Water-tube boilers and auxiliary installations - Part 8: Requirements for firing systems for liquid and gaseous fuels for the boiler]
- ELOT EN 13445 [Unfired pressure vessel]
- ELOT EN 10028 [Flat products made of steel for pressure purposes]



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3. MATERIALS

Steel plate boilers as well as cast iron boilers may be used.

The materials shall be of an approved grade (e.g. steel plates according to **ELOT EN 10028**).

Tube material will be as per **ELOT EN 10216-2** (Materials P235GH and P265GH).

Cast iron shall at least fulfill the requirements laid down in **ELOT EN 1561**.

4. TECHNICAL REQUIREMENTS

Boilers shall be of a type suitable for natural or forced draft gas burners and natural gas.

Boiler shall preferably be of the three-pass type.

The requirements to greater boiler systems of the closed type with safety relief valves shall be fulfilled i.e. the boilers shall be equipped with:

- a water temperature control device
- an overheat shut-off device (max. permissible water temperature is 110 °C)
- a low water level safety device
- an alarm system connected to above-mentioned safety device



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- each boiler shall be fitted with at least two (2) safety relief valves

In addition, boiler shall be fitted with a thermometer and a pressure gauge connected to the water circuit and a thermometer for measuring the flue gas temperature.

The water temperature control device shall enable adjustment of the outlet water temperature at least between 65 °C and 95 °C.

Boiler shall be equipped with a high-low thermostat for controlling the two stage gas burner on step 1 or step 2.

The temperature difference between the water thermostats make and break points shall not be higher than 4 °C.

Boiler shall be insulated in order to minimize the heat losses.

At the burner rating, stated boiler efficiency shall be at least 0.87. The exhaust gas temperature shall never be lower than 90 °C.


Boiler efficiency shall be at least 0.84 with a load corresponding to 35% of the nominal useful output, unless otherwise specified by European Norms or Greek Legislation.

Boiler fluid will be a mixture of water and triethylene glycol (60%/40% by weight) added 1% inhibitor, (DODIGEN).

The boilers shall be suitable for operation/installation under the following conditions:

- max. operating pressure $P_g = 3.5$ bar (gauge) at a maximum temperature of 110 °C.
- boiler outlet temperature 90 Deg °C.
- design temperature difference between water glycol mixture outlet and return will be 20 Deg °C.
- flange connections for water inlet and outlet.
- flue gas ducting preferably 300 mm.

The required heat capacity of each boiler shall be, of the above-mentioned conditions as shown in the relevant boiler Process specifications, depending on the M/R station category in question. Actual capacity will be specified. Boilers should preferably be designed such that later extension of capacity is possible.

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The boiler shall be designed to avoid any disturbing noise caused by local overheating or insufficient water circulations, and to minimize the fire box pressure.

5. QUALITY CONTROL

5.1 FACTORY TEST

At the factory, the boilers shall be tested according to the requirements given by Standards and Greek regulation mentioned in para 2.0

At all times during which work on the order is being carried out, purchaser or his representative shall have free access to those parts of the Manufacturer's premises which concern the manufacture and testing of the items ordered. The Manufacturer shall, without charge, provide the Purchaser or his Representative with all reasonable facilities necessary to satisfy him that the product is being produced in compliance with his specification.

5.2 STATION COMMISSIONING

Owner reserves the right to reject a boiler if the outcome of the station commissioning reveals that the requirements of this specification are not satisfied.

6. MINIMUM DERIVERABLE REQUIREMENTS

The following documentation / drawings are the minimum requirements for the deliverables by the Vendor, at three (3) copies, unless otherwise specified:

- Detailed construction and assembly drawings including parts list detailing material standard and grade, item description, locations of outlets, etc.
- Design calculations, dimensions, etc. including completed material requisitions and datasheets.
- Testing specification and certifications,
- Identification plate text (nameplate),
- overall weight (with and without water),
- manufacturing schedule,



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- Comprehensive operation, maintenance and reconditioning manuals in Greek and English,
- List of recommended tools, consumable spare parts, etc.,
- List of materials and certifying authorities.
- As-built drawings,
- drawing showing spare part numbering,
- commissioning manual,
- operation manual
- servicing manual
- Electronic files (word documents and/or AutoCAD documents as applicable and scanned PDF files) of all Documents, Drawings and Certificates.

All boilers documentation shall be approved by Owner prior purchase order and afterwards this approval shall be obtained by the Vendor and a copy of the approved material shall be forwarded to the Purchaser.

7. SPARE PARTS

It's a minimum two (2) spare gaskets plus 10% bolts and nuts (minimum two) shall be supplied with the delivery.

8. DELIVERY

The delivery is not considered fulfilled until all items and the associated documentation and certificates are received.

One-piece boiler shall be furnished.

All outlets shall be capped and all flange faces shall be protected against corrosion and damaging.

Where necessary, boiler and its components shall be supported by temporary and erection stiffeners to avoid distention and damage during transportation stiffeners to avoid distention and damage during transportation and erection.



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