

# **HOT WATER BOILER**

High Voltage Hot Water boiler Power: 4 - 60 MW Voltage: 6 - 14 kV

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Low voltage Hot Water Element boilers Power: 100 kW – 5 MW Voltage: 400 - 690 V



# STEAM BOILER

High voltage Electrode Steam Power: 4 - 60 MW Voltage: 6 - 14 kV

Low voltage Steam Element boilers Power: 100 kW – 5 MW Voltage: 400 - 690 V





99,9% EFFICIENCY NO POLLUTION - ZERO EMISSIONS NO FUEL HANDLING LESS INSTALLATION COST HIGH RELIABILITY FAST START-UP AND PRECISE CONTROL LESS MAINTENANCE UP TO 60 YEARS LIFE TIME



## ELPANNETEKNIK HIGH VOLTAGE ELECTRODE HOT WATER BOILER

The boiler is made for a 3-phase connection and an operating voltage of 6-15 kv and an operating temperature of up to 120°c. For higher temperatures we supply steam boilers in combination with a steam/water heat exchanger. The boiler is y-connected with one phase connected to each electrode as installed hanging on insulators in the pressure vessel ceiling. The current is conducted directly in the water between the phase electrodes and the neutral point electrodes consisting of 3 tubes which are fixed mounted in the pressure vessel. The power depends on the size of the surface that can conduct the current between phase and neutral.

Adjustable control shields of insulating material for controlling boiler capacity output are installed on a common yoke and are placed between the phase electrodes and the neutral point. The boiler water's conductivity is adjusted for maximum power output when the electrodes are completely exposed and the feeding temperature is correct. If the power becomes too high, water is replaced for reduction of conductivity. If the power is too low, chemical dosing is performed until preferred maximum power is reached. The boilers are normally delivered with an electrically insulated neutral point, increasing safety and reducing investment cost for transformers, but can also be directly connected to earth using a dedicated transformer.

# HIGH VOLTAGE HOT WATER SYSTEM



# PRINCIPLES OF OPERATIONS – HIGH VOLTAGE ELECTRODE HOT WATER BOILER SYSTEM

Unlike competitors producing only steam- or hot water boilers, Elpannetekniks wide product range enable the company to objectively optimize solutions for each project regardless required temperature. Elpannetekniks unique software, and less than 30 seconds from minimum to maximum load of boilers, enable the systems to be used for grid frequency balancing and for thermal energy storage. This providing opportunities for utilizing price differences peak / valley period and for balancing renewable energy to the electrical grid.

Demineralized hot water is circulated between the boiler and heat exchangers connecting towards heat accumulators for thermal energy storage and towards the energy consumers absorbing the thermal energy generated by the boiler.

Operating pressure is kept by pumping water from an expansion vessel towards the system. Two frequency controlled pumps, of which one in automatic spare, keep the operating pressure. When the operating pressure is reached, the speed is decreased. If the pressure still increases, an overflow valve open and the water is diverted to the expansion vessel.

Filling of the system is done through a demineralizing filter to receive a conductivity less than  $10\mu$ S/cm (at 25°C) and a pH above 7. After filling trisodium phosphate (Na3PO4) is added using a dosing unit to reach the necessary conductivity and a pH between 8.5 and 9.5.

Water samples for inspection are collected through a sample cooler.

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# CERTIFICATES

### Meeting the highest Quality demands – even within Nuclear and Offshore

# ALSTOM Cedf SIEMENS

### TIV NORD

# CERTIFICATE

This is to certify that:

### Elpanneteknik Sweden AB

Lilla Bommen 1 411 04 Göteborg Sweden



With the sites: Elpanneteknik Sweden AB, Idbäcksvägen 8, 611 38 Nyköping, Sweden

Applies a management system in accordance with: TÜV NORD Scandinavia AB certification scheme and

### EN ISO 9001:2015

Regarding the extent and scope:

Design, manufacture and sales of electric high and low voltage boilers, for steam and hot water applications within district heating, power generation, process and marine industry.

The validity of this confificate is assured through annual surveillance audits.

Carlicate No. 5749/3027606-01 Addit report number: 201811091415-247 Fewayword and certified by:

Jonas Jinnestrand Business Segment Manager TÜV NORD Scandinavia AB Helsingborg, 2018-11-14

102V NDPD: Scandinevia AB Gässbäcksvägen 20 SE-252 27 Helsingborg www.turnoid.ae

Valid from: 2018-11-14 Valid until: 2021-11-14



LOCAL TTS P-34.34





# WORLDWIDE NETWORK FOR SALES, **AFTERSALES** AND INSTALLATION