

# SAN<sup>®</sup>

Member of the NIBE Group

Electro Heat



## Process Heating

## Electrical Heating through decades

With more than 50 years of experience SAN Electro Heat's most valuable asset is special know-how about design, product development, and manufacturing of professional electrical heating equipment for industrial use.

The company is geared to deliver 100% customized products, and thus functions both as a catalyst for a development project and as a supplier of the final product. At the same time we ensure and maintain the required quality level, mechanical and electrical dimensioning, approvals, and documentation.

**ΩNIBE** Being part of the Swedish NIBE Group gives us world wide representation - sales and production - and we are thus able to service our customers anywhere in the world.

## SAN Electro Heat a/s is driven by a desire to deliver advanced heating solutions to critical customer applications

Today's customers demand reliable and cost efficient solutions. We can deliver 100% customized products, and our close cooperation with our customers gives us a deep knowledge about each specific application. Thus it is our mission to understand our customers' change in need and requirement and constantly adapt and develop our products accordingly.

We are able to deliver products approved according to our customers' requests.

It is our vision to become all customers' first choice whenever they need technical electric heating for their project.

SAN's know-how is today divided into four business areas:

- Wind Power
- Railway Systems
- Process Heating
- Heating Cables

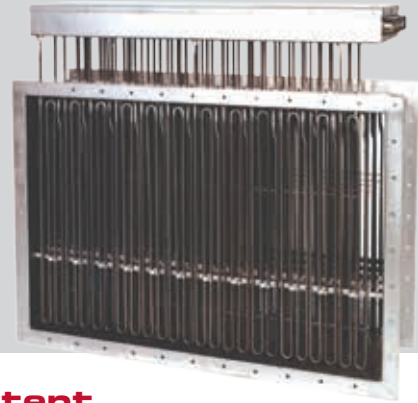
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# All-Purpose Electric Heating



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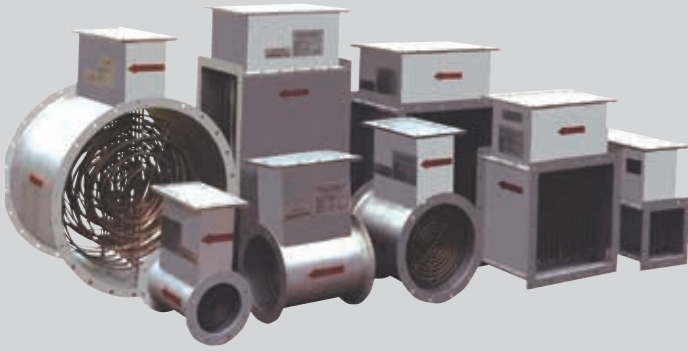
### Electrical Heaters for Liquids, Gas and Space Heating

SAN Electro Heat a/s designs, develops and manufactures all types of systems for electrical heating of gases, liquids, vapours and solids.

The company prides itself on working closely together with its customers to manufacture systems which meet the most stringent international standards. The company's expertise in the field of electrical heating covers the chemical, pharmaceutical, petrol chemical (both on shore and off shore applications), steel, textile, glass, power generation and foodstuff industries. In fact, any application where process heating is required. The company is able to supply heating elements, pressure vessels and control panels/systems, all fully tested and certified to meet the required standards, including Ex-proof.

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## Electrical Heaters in Off Shore Versions

Background heating of working- and living-quarters. Manufactured in acid-proof stainless steel, fitted with IP 65 terminal boxes with built-in thermostats for temperature control, and prevention of excess surface temperatures on the heating elements. In each group, one of the elements is equipped with an internal thermo couple monitoring temperature rise as overheat protection in the event of reduced air flow or failure.

### Technical Data:

Output:	From 5kW to 132kW
Voltage:	3x440V
Op. parametres:	-15°C to +22°C
Temperature class:	T4
Casing:	IP 65

## Electrical Heater for Nitrogen

Built into a certified welded pressure tank with inlet and outlet flanges.

Raised terminal box with built-in thermo couple.

### Technical Data:

Output:	230,6kW
Voltage:	3x600V
Operating temperature:	-35°C to -15°C
Operating pressure:	13.5 bar
Casing:	IP 55



## High Voltage Heater for Heating of Process Air in Spray-Drying Plants

in 3 groups, with special flanges, tested at 75kV impulse voltage and 10kV Megger.

### Technical Data:

Temperature out:	340°C
Air:	70.000 kg/h
Material:	Stainless steel, AISI 304
Output:	2,4MW - 3x800kW
Voltage:	3x10,6kV
Dimensions duct: (HxWxL)	2 x 2 x 4,2m
Insulation:	300mm Skamol

## Process Heater

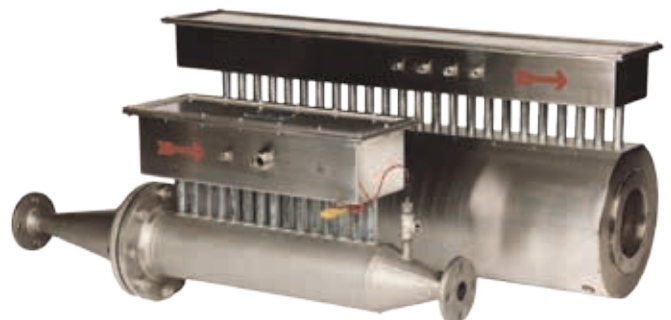
Output:	12kW
Voltage:	3x380V
Operating temperature:	450°C

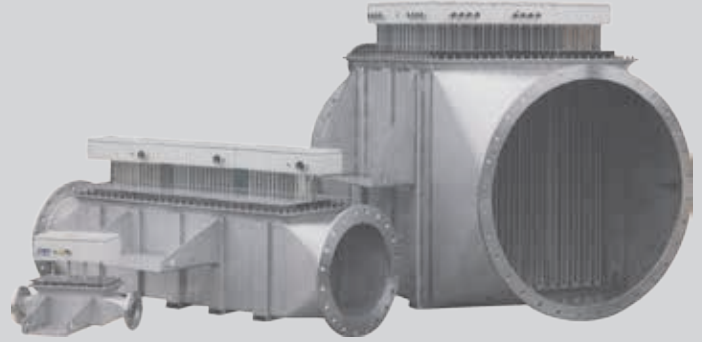
## Gas Heater

Output:	21kW
Voltage:	3x380V
Operating temperature:	150°C
Operating pressure:	15 bar
Variable flow:	0-300Nm <sup>3</sup> /h

## Regulation

Thyristor control with zero scale. Information panel showing temperature, kilowatt meter, ammeter and reset function.





## Duct Heaters for Ventilation Systems e.g. on Ships

SAN's duct heater for ventilation heating (35°C) is manufactured from stainless steel with stainless steel heating elements. The ducts are equipped with perforated plates to optimize the air distribution. An anti-condensation heating element is installed in the terminal box to prevent condensation when the heating elements are not operating. A double overheating protection and if necessary a fire thermostat are mounted.

## Electric Heaters for Preheating Process Air used in the Chemical Industry

Manufactured from stainless steel and divided into 10 detachable sections for extremely easy servicing. The electrical heater is divided into 2 groups, respectively 157.7kW and 143.3kW.

### Technical Data:

Output:	301kW
Voltage:	3x690V
Operating temperature:	350°C
Equipment channels:	AISI 304 (W.1.4301)
Heating elements:	AISI 316 Ti (W.1.4571)
Dimensions (HxWxL):	1000x1200x626mm

## Process Heater for Air / Steam

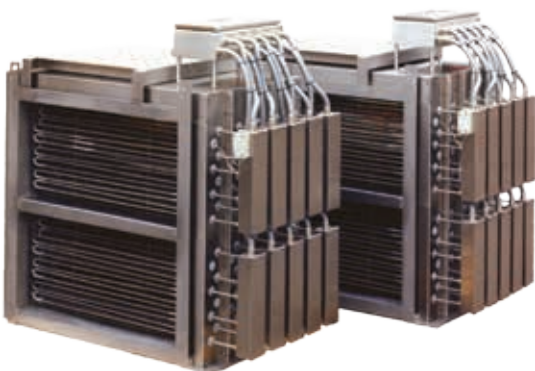
Manufactured from a special type of stainless steel which withstands temperatures of more than 500°C. The heater is divided into sections. Controlled by a PLC regulator, which monitors temperatures, flow volume and composition of hot elements.

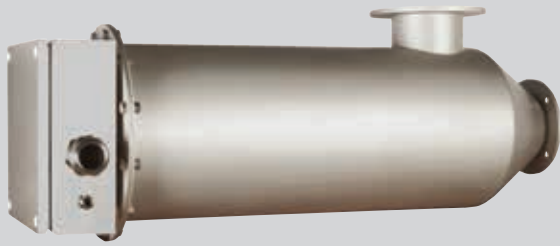
### Technical Data:

Output:	275kW
Voltage:	3x400V
Operating temperature:	500°C

## Vacuum Heater

Output:	65kW
Voltage:	3x400V + PE
Temperature out:	270°C
Casing:	IP 65
Design codes:	BS5500





**Process Heater**

Output: 40kW  
 Voltage: 3x400V+PE  
 Temperature in: 25°C  
 Temperature out: max. 350°C  
 Air flow: 360kg/h  
 Materials: Stainless steel, AISI 304, 316  
 Protection: IP66  
 Thermo couple as over heat protection.

**Process Heater**

With replacable heating battery  
 Output: 35kW  
 Voltage: 3x575V+PE  
 Temperature in: 20°C  
 Temperature out: 330°C  
 Air flow: 400kg/h  
 Materials: Stainless steel, AISI 316

**High-Voltage Heater for use in Processing Raw Materials**

The world's first high-voltage electrical heater was delivered by SAN in 1986. This equipment was developed by SAN's engineering department, and won the Danish Engineers' Association Prize for electrical innovation in 1988. The unit is built with 2 independent insulation systems, where the material itself is both an electrical and thermal insulation. To facilitate service, each of the 14 sections is mounted on rollers, and can, with little effort, easily be rolled out of the heater. This equipment is fitted with pyrometers to measure temperature levels in the heating elements.

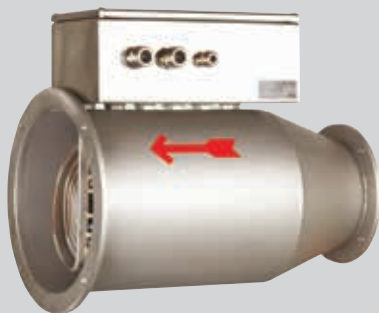
**Process Heater**

Output: 9kW  
 Voltage: 3x415V  
 Temperature in: 25°C  
 Temperature out: max. 350°C  
 Air flow: 80kg/h  
 Materials: Stainless steel, AISI 304, 316  
 Protection: IP66  
 Thermo couple as over heat protection.

**Technical Data:**

Output: 14,000kW  
 Voltage: 3x10,600V  
 Operating temperature: 430°C  
 Max press. in conductor: 17,500Pa  
 High-voltage test: 28,000V  
 Shock tension test: 75,000V  
 Dimensions (HxWxL): 3 x 3.5 x 10m





## Process Heater

Output: 14,5kW  
 Voltage: 3x400V  
 Specific Watt load: 3W/cm<sup>2</sup>

## Mobile Load Resistor

SAN mobile load resistor 1MW divided into groups. The load resistor is built as a mobile unit, to be tugged by a motorized unit at max. 15km/h - 10 mph. The dimensions of the trailer is approx. 3200 x 1500mm. The resistor is mounted with airfilled rubber wheels, a pole with appliance suitable for a standard ball on the tugging vehicle and a lamp arrangement for a standard trailer. Additionally, the load resistor is equipped with a parking brake at the back-end. The total height of the unit is approx. 2000mm. The load resistor is built with control panel at the back end, the resistive part in the middle and the reactive part at the front. The resistive part is cooled by 4 fans, which are placed at the bottom with vertical out blow at the top. The reactive part is with natural cooling via gaps in the side plates. The resistive part is built by SAN tubular heating elements, which are divided into groups. The reactive part is built by coils divided into 2 off 3x50KVar and 21 off 3x100KVar.



## Preheating of Power Station Emission Gases:

Electrical heaters for preheating emission gases. Manufactured from acid-proof stainless steel, with heating elements of the same materials, type BC, mounted on detachable flange plates with IP 55 cable duct, raised 250mm over the heat conductor. This type of electrical heater is for varying pressure and temperature. As safety, a thermo couple is mounted directly on the heating elements.

### Technical Data:

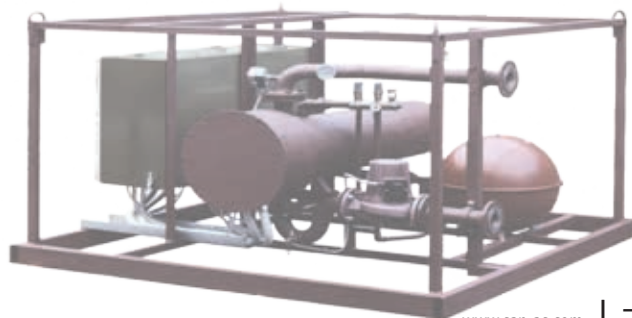
Output:	368kW	88kW
Voltage:	3x380V	3x380V
Volume of gas:	13,300kg/h	12,900kg/h
Operating temp.:	350°C	20°C
Pressure range:	6500Pa	8500Pa
Casing:	IP 55	IP 34
Composition:	AISI 316 (W.1.4436)	Galvanized steel plate

## Flow Heater Unit

Complete flow system for the heating of liquid. Consisting of OB pre-heater divided into groups, uninsulated with 2 1/2" in- and outletpipes with flanges. The unit is built in a steel frame for 20 feet container transport and comprises pressure expansion container with 2 off safety valves, air discharger, manometer, circulation pump and control panel.

### Technical Data:

Output:	155kW
Voltage:	3x415V
Group division:	3 groups, 5 - 75 - 75kW





## Flow Heater

Output:	3,5kW
Voltage:	230V
Temperature in:	10°C
Temperature out:	140°C
Specific Watt load:	2,2W/cm <sup>2</sup>
Media:	Air
Air flow:	30kg/h

## Electrical Heater

Output:	60kW
Voltage:	3x380V
Temperature in:	0°C
Temperature out:	180°C
Air volume:	779m <sup>3</sup> /h

Insulated duct with flanges, stainless steel heating elements.  
PT100 sensor as overheat protection.  
To be controlled by a thyristor.

## External Heater

With motor, pump, and expansion valve. For heating of lubricating oil in gearboxes, e.g. in arctic areas where additional heating is required.

The built-in pump circulates the lubrication oil through the gearbox.

The flow heater is equipped with a pump, temperature limiter, and PT100 sensor. ETL approved.



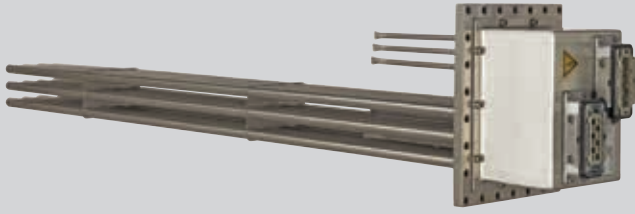
## Steam Heater

EX electrical steam heater  
Power: 12 kW  
Voltage: 380-415V  
corresponding to 15 kg steam/h at 2 bar. g.  
Complete with automatics, armature, instruments and cover.  
For EX Zone 1.





# Advanced Heating Solutions

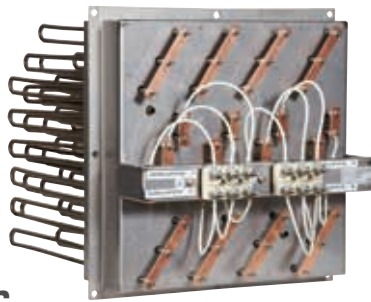


## Flange Heater for Hydraulic Oil

Power: 6kW  
 Voltage: 3x400V  
 Specific Watt load: 0,75W/cm<sup>2</sup>  
 Immersion depth: 1180mm  
 Material: Stainless steel  
 with replacable heating element without draining the vessel.

## Flange Heater

Power: 12kW  
 Voltage: 3x690V  
 Specific Watt load: 2W/cm<sup>2</sup>  
 Immersion depth: 950mm  
 Media: Oil  
 Operating temp.: 90°C  
 Connection box: IP65



## Flange Heater for Tunnel Ovens

Output: 32kW  
 Voltage: 3x400V

## Immerge Heater

For hydraulic oil with magnets for fixation, 2000W - 3x690V - 1W/cm<sup>2</sup>.  
 Available in other voltages and wattages upon request.  
 Material: Stainless steel AISI 316.



## Glycol Heaters

Our glycol heaters are used for pre-heating of cooling water in the cooling/heating system in converters in wind turbines before start-up of the wind turbine.

The glycol heaters are delivered in various materials and designs to meet customer requirement.



## Immersion Heaters

All our immersion heaters are available in required voltage, power and length, with flange or thread. All the heaters are designed to comply with requirements and specifications for products used in the process industry. Also available as food approved versions.





### For Thawing Soil

Used in church yards in connection with urn graves during winter weather with hard frost. Also applicable for other digging works.

Power: 1200W,  
or other upon request  
Voltage: 230V

Adjustable built-in thermostat 30-110°C and overheat protection.

Low surface temperature upwards. Heating only downwards.



### Filter Housing

For heating of oil in the process industry. Built-in adjustable mechanical temperature limiter. Pt100 sensor. Material: AISI 316. With built-in high temperature heating cable. Wattage according to customer requirements.

### Heating Element in Cast Material

Power: 200W  
Voltage: 65V  
For dairy industry.



### Finned Tubular Radiator

Industrial radiator for heating of rooms - garages - cabinets etc., with great demands for a robust construction. Available in grey painted steel. Available as standard or in voltage, power, and length according to customer specification.

SPECIAL VERSION: vibration- and shock safe, e.g. for use on ships.

Protection class: IP55.

Standard colour: RAL 7032 grey. Other colours upon request.

Surface temperature: 120°C at 22°C ambient temperature.



### Panel Furnace

For mounting on the wall or floor bracket, especially applicable for heating of churches. Very low surface temperature and very low noise when operating.

Voltage: 230V, 400V or 3x400V  
Colour: white RAL 9016 (Standard)  
other colours upon request  
Insulation: IP 22





## Controller consisting of PLC and Switches

Programmed as a Pi-controller, containing a range of security programmes for monitoring safety, maximum flow alarm, maximum temperature, etc. The switchboard is equipped with control panel and meters showing voltage, current and temperatures.



## Flow Modules for Heating of Air and Liquids

Materials used are according to the customers' requirements and demands.

Can be built-up easily and mounted as required. Pressure, temperature levels and materials used will depend on the specific project and application.

After installation, the equipment is pressure tested according to the specifications.



## Self-Regulating Heating Cable

This cable is often used as it changes emission of heat (Watt/m) in relation to the ambient temperature because of the way it is constructed. The cable can also be delivered as type EEx and with an outer PTFE jacket.

## Pipe Tracing

Everywhere in the chemical industry it is necessary to avoid heat loss in pipelines. Previously steam was used but today it is an economical advantage to use electrical heating cables during installation as well as during operation.

SAN offers a wide range of industrial heating cables up to 1000°C as well as a complete range of controls and thermostats.



## Valve/Tube Heating

Special design is necessary for optimum functioning, and to ensure minimum operation costs, SAN offers tailor made solutions.



# SAN<sup>®</sup>

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## Electro Heat

- Process Heating
- Heating Elements
- Heating Cables
- Finned Tubular Radiators
- Immersion Heaters
- Church Heating
- Frost Protection
- Ex-Material
- Oilfilled Radiators
- Drum Heaters
- Heating Pads
- Flow Heaters
- Air Duct Heaters
- High-voltage Resistors
- Controllers



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