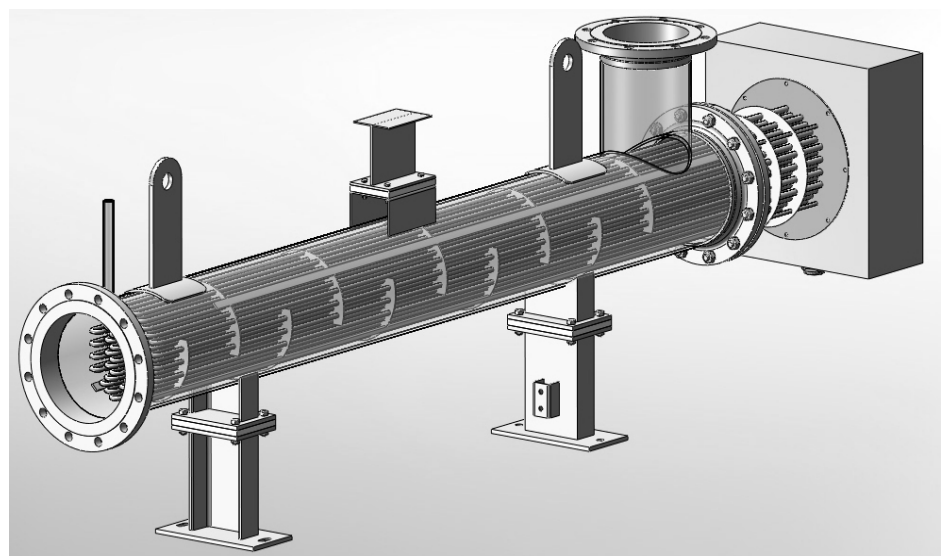


Electric process heaters and control panels

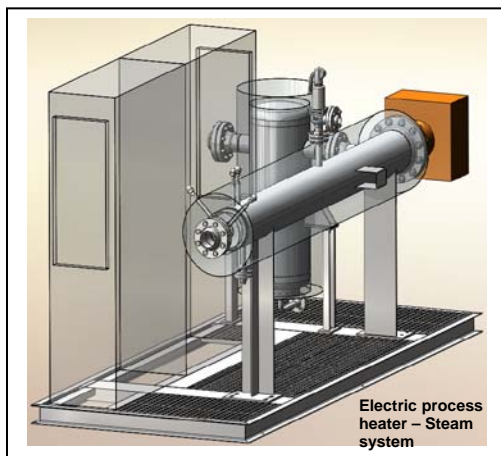
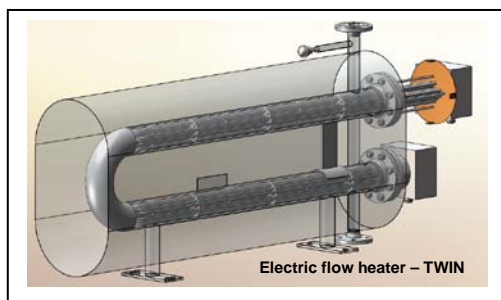
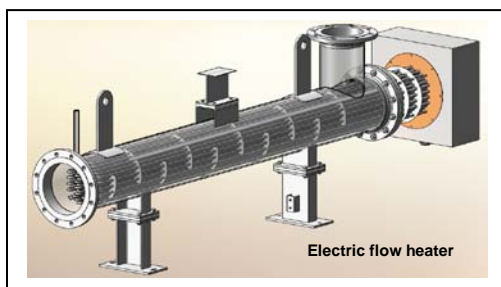
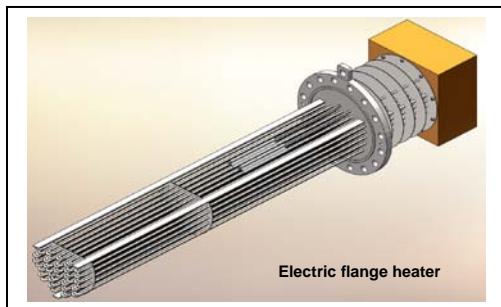


Electric process heaters and control panels

Our core expertise:

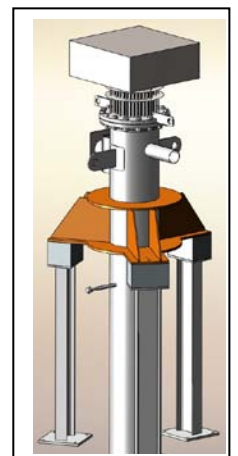
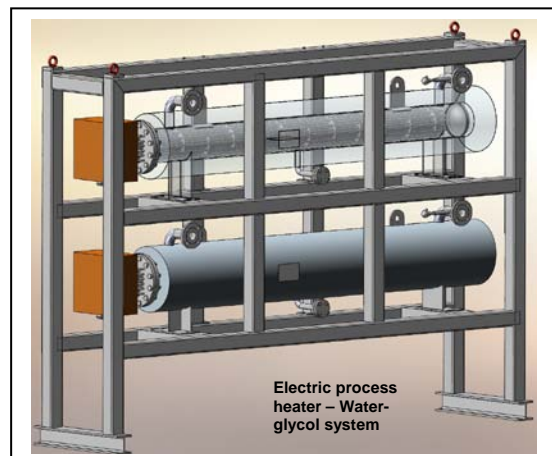
OhmEx plans, manufactures and supplies electric process heaters and electrical control panels

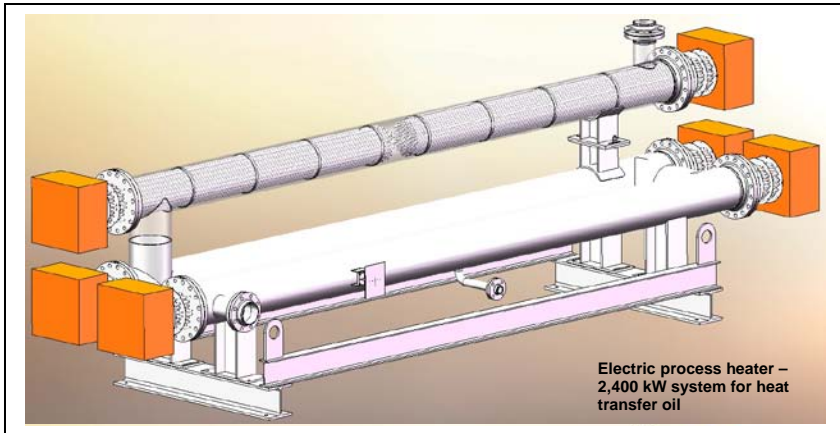
- for use in safe areas
- for explosion-protected zones to ATEX, IECEx 



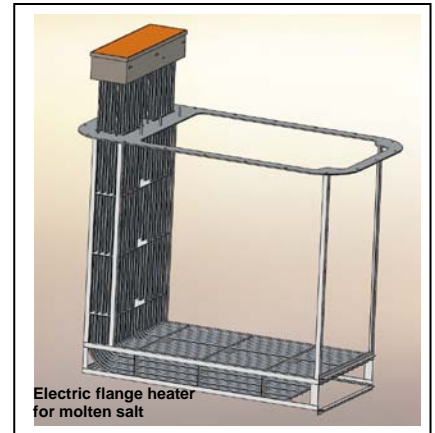
Industrial applications

- General engineering
- Oil and gas processing
- Storage and processing of inflammable materials
- Petrochemicals
- Chemistry
- Pharmaceutical industry
- Marine applications
- Energy generation
- Environmental technology
- Electrical systems
- Iron and steel production
- Dryer oven construction
- Building technology





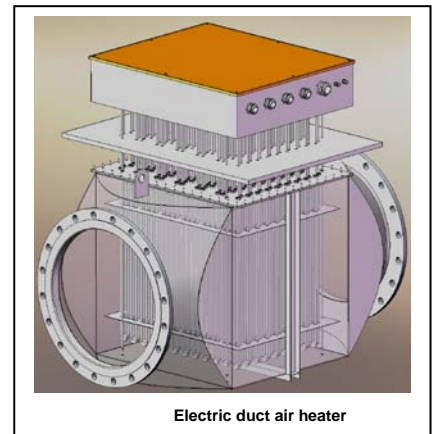
Electric process heater – 2,400 kW system for heat transfer oil



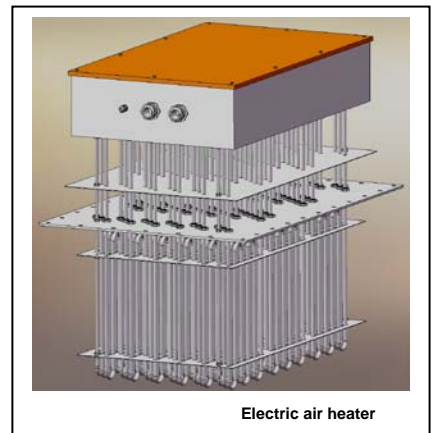
Electric flange heater for molten salt

Application areas

- Compressors / oil pre-heating / compressed air / water-glycol mixtures / heat carriers / fully desalinated or demineralised water
- Joule Thompson / hydraulics
- Room heating systems / built-in tank heating
- Inflammable materials such as benzines / oils / combustible gases / crude oil / molten salts
- Gases / nitrogen / chemicals
- Washing/drinking water / machine oil / seawater
- Power plant technology / steam super-heating / sealing steam / anti-icing / anti-condensation heating
- Catalytic afterburning / biodiesel production / air
- Heat carriers / water-glycol mixtures / corrosive fluids / fully desalinated or demineralised water
- Circulating air heaters / continuous furnaces
- Heating / air-conditioning / ventilation



Electric duct air heater



Electric air heater



Electric control panel



Electric duct air heater

Our services

Consultation

- Feasibility/efficiency studies / quotation
- Process-technology design
- Scheduling and project management
- Quality assurance

Planning / design

- Draft planning / production of design drawings
- Thermodynamic and electrical calculations
- 3-D volume modelling (Solid Works 2011 ®)
- Danger Risk analysis to DGRL
- Production of circuit diagrams

Manufacturing services (with cooperation partners)

- Mechanical production, welding
- Pressure vessel construction
- Heat insulation
- Electric control panels

Test services

- Drawing checking by an approved body (e.g. TÜV)
- Acceptance testing by an approved body / CE conformity declaration
- Pressure and integrity testing (demineralised water / helium / Nekal)
- Non-destructive testing FE, X-ray testing
- Electrical testing (insulation resistance, high-voltage test)

Service functions:

- Commissioning, training of operating personnel
- Documentation (WORD / EXCEL / PDF / DWG / DXF / STEP)

Certification:

Quality is an integral component of the **OhmEx** company philosophy, and therefore the basis of all our actions. In order to meet this claim at the highest level, we have introduced a **quality management system to DIN EN ISO 9001:2008**, which has been assessed and certified by DQS GmbH.

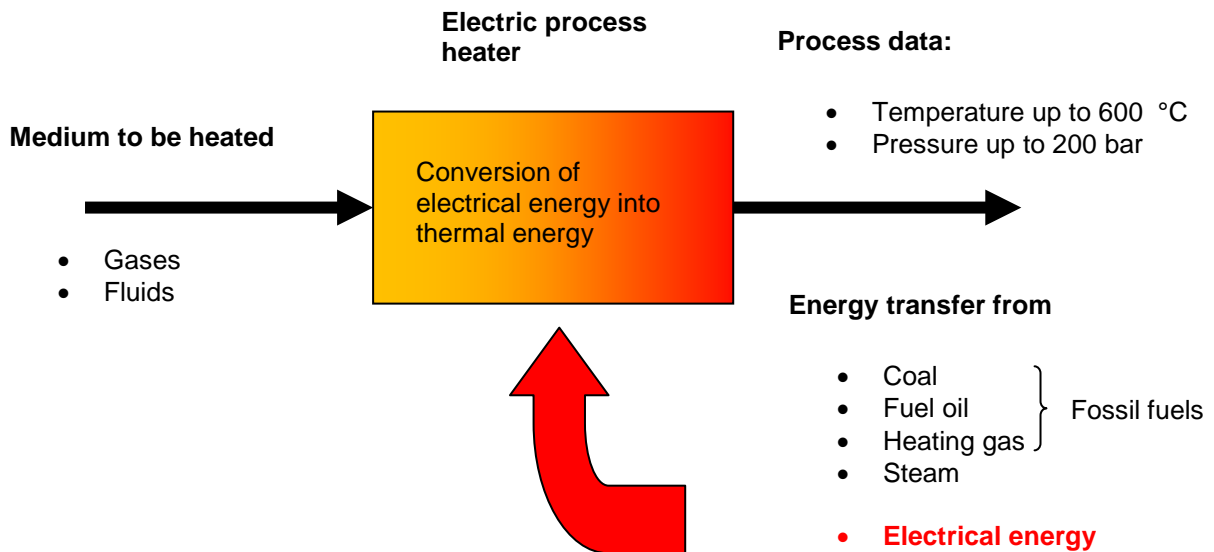


Technical information

Schematic view of a heating process

Many essential industrial processes require the heating of gaseous or fluid media. This takes place through energy transfer from fossil fuels, steam, or by the conversion of electrical energy into thermal energy.

OhmEx supplies electric process heaters.



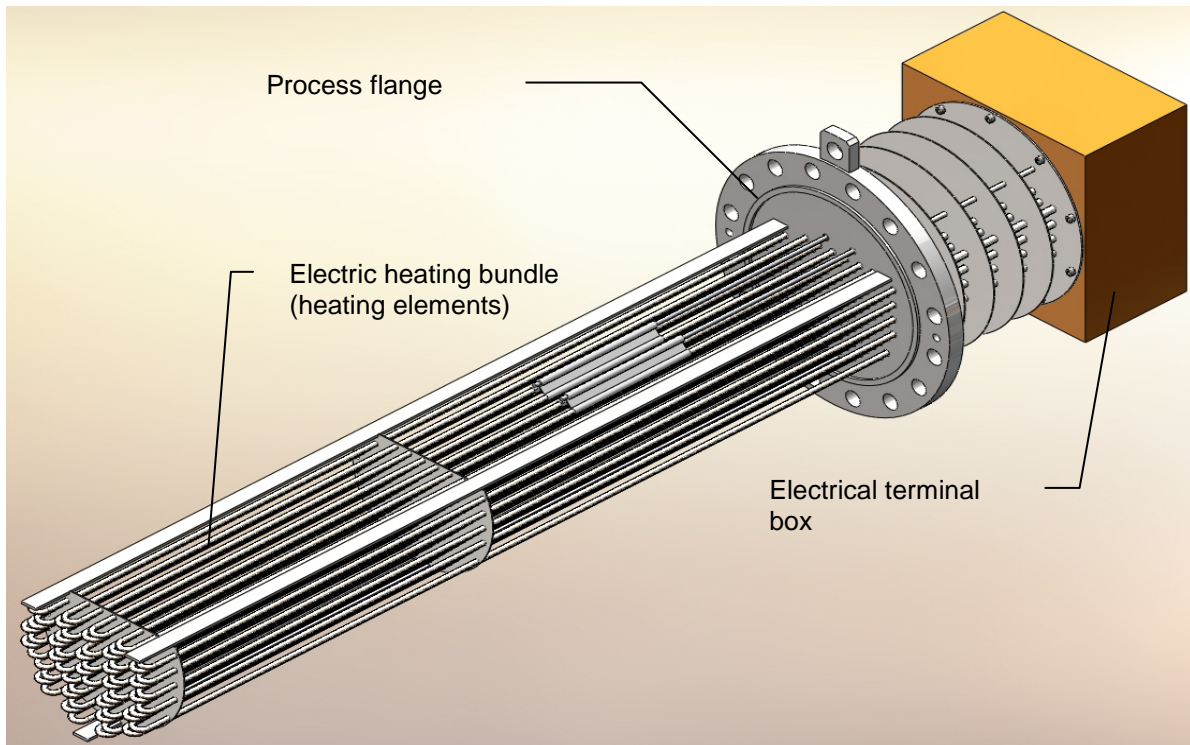
Advantages of our electric process heaters

Technical feature

Customer benefits

| | |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrical energy | <ul style="list-style-type: none"> • Process heat is available immediately • Accurate output and temperature regulation • High efficiency level (98%) • No environmental contamination / emissions |
| Design | <ul style="list-style-type: none"> • Compact design, low space requirement • Large selection of usable materials |
| Installation | <ul style="list-style-type: none"> • Easy and manageable • Low installation costs |
| Operation | <ul style="list-style-type: none"> • High operating reliability even in permanent operation • Long service life |
| Maintenance | <ul style="list-style-type: none"> • Good accessibility, e.g. for maintenance / cleaning • Low maintenance costs |

**Electric flange heater
Type FHK**

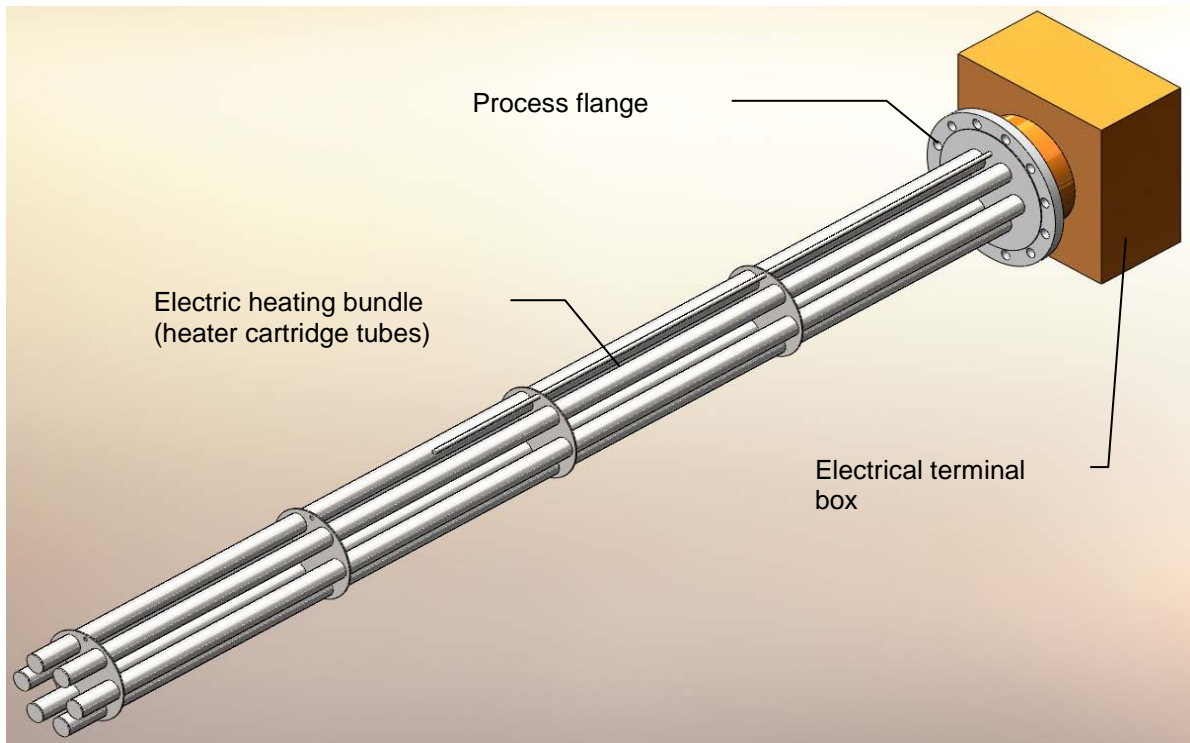


Description

The FHK series of electric flange heaters offers a solution for the heating of fluids in process tanks, pressure vessels or similar applications. The flange heater consists of a number of heating elements, which are TIG-welded into the process flange. The electrical connection takes place in a robust Electrical terminal box.

| Key data | Typical application areas |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Process flange to DIN / ANSI • Nominal width DN 40- DN600 / 1"- 24" • Pressure level up to PN160 / 2500 lbs • Heating output up to 1500 kW • Connection voltage max. 690 V • Ambient temperature -50/ + 60 °C • Heating up to +400 °C | <ul style="list-style-type: none"> • Pre-heating of oil / water / glycol • Process heating • Cleaning and flushing tanks • Heat transmission systems • Boiler equipment • Frost protection |
| Process flange/heating elements materials | Production / design codes |
| <ul style="list-style-type: none"> • Incoloy 800/825 (1.4876 / 2.4858) • Stainless steel 1.4404 (AISI 316L) • Inconel 600 / 625 • Stainless steel 1.4541 (AISI 321) • Stainless steel 1.4571 (316 Ti) | <ul style="list-style-type: none"> • PED 97/23/EG • ASME VIII Div. 1/2 • AD2000 notices • Ship classifications: DNV Det Norske Veritas LR Lloyds Register; BV Bureau Veritas, GL Germanischer Lloyd • GOST • SQL / SELO (China) |

**Electric flange heater
Type FHK-P**

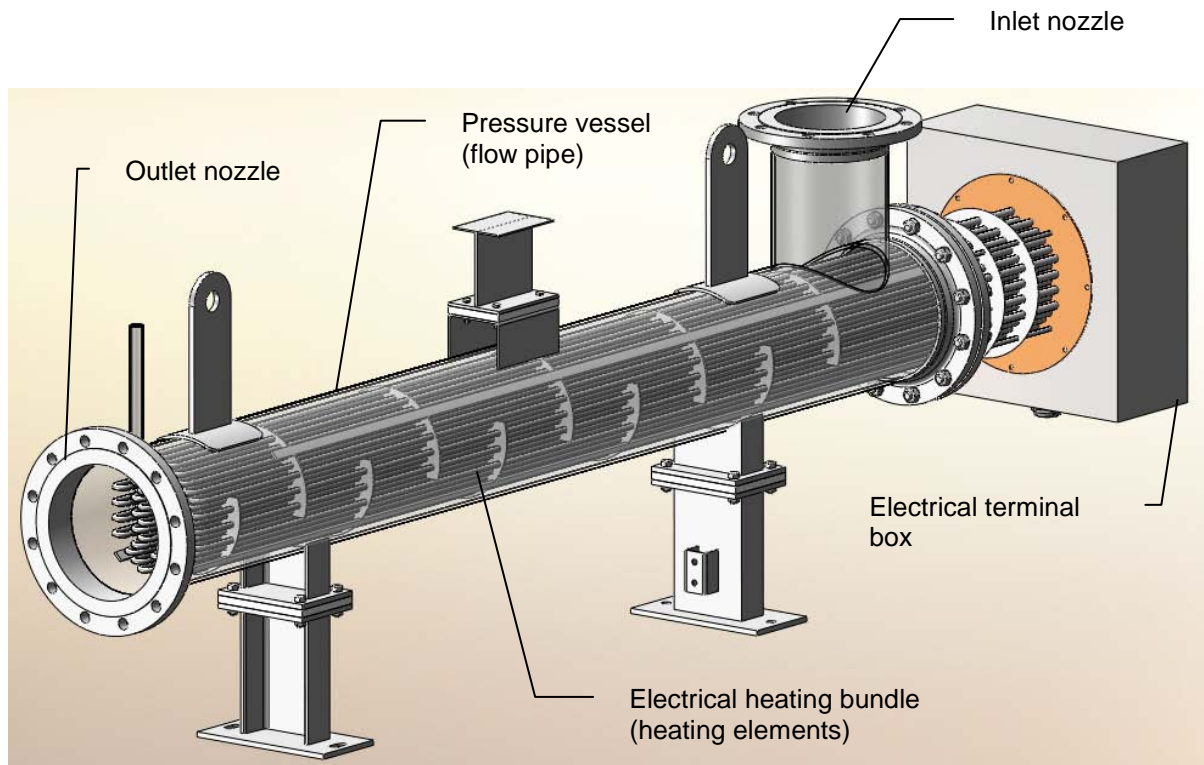


Description

The FHK-P series of electric flange heaters offers a solution for the heating of fluids in process tanks, pressure vessels or similar applications. The flange heater consists of a number of heater cartridge tubes welded into a process flange, into which replaceable ceramic heating elements are installed. These can be replaced easily and individually, without having to remove the complete flange heater (**an advantage for example in large storage tanks**). The electrical connection takes place in a robust Electrical terminal box.

| Key data | Typical application areas |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Process flange to DIN / ANSI • Nominal width DN 40- DN600 / 1"- 24" • Pressure level up to PN160 / 2500 lbs • Heating output up to 1500 kW • Connection voltage max. 690 V • Ambient temperature -50/ + 60 °C • Heating up to +400 °C | <ul style="list-style-type: none"> • Pre-heating of oil / water / glycol • Process heating • Cleaning and flushing tanks • Heat transmission systems • Boiler equipment • Frost protection |
| Process flange/heating elements materials | Production / design codes |
| <ul style="list-style-type: none"> • Incoloy 800/825 (1.4876 / 2.4858) • Stainless steel 1.4404 (AISI 316L) • Inconel 600 / 625 • Stainless steel 1.4541 (AISI 321) • Stainless steel 1.4571 (316 Ti) | <ul style="list-style-type: none"> • PED 97/23/EG • ASME VIII Div. 1/2 • AD2000 notices • Ship classifications: DNV Det Norske Veritas LR Lloyds Register; BV Bureau Veritas, GL Germanischer Lloyd • GOST • SQL / SELO (China) |

**Electric flow heater
Type STR**

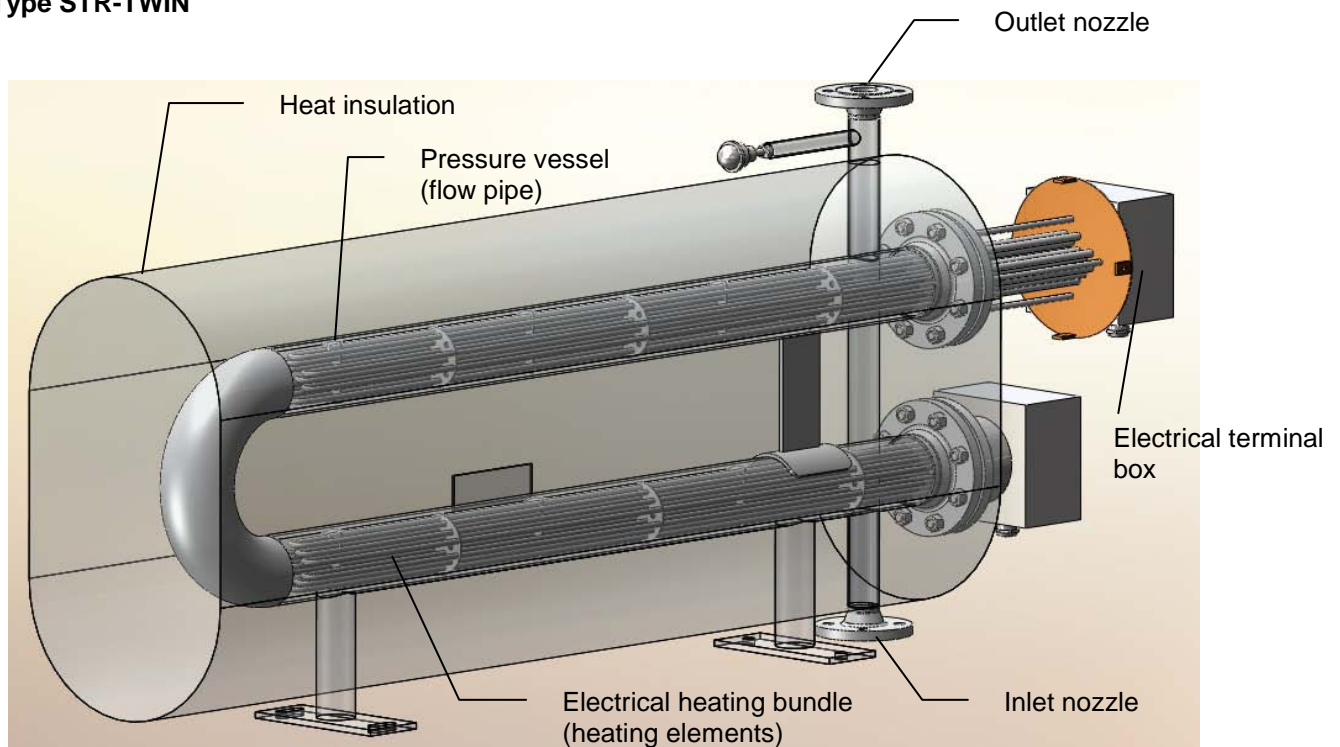


Description

The STR series of electric flow heaters is suitable for use for the heating of (pressurised) gases and fluids in the industrial environment, and is manufactured to customer specifications. These process heaters carry the CE designation in compliance with the current CENELEC standards, and also comply with the applicable IEC standards.

| Key data | Typical application areas |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Process flange to DIN / ANSI • Pressure level up to PN160 / 2500 lbs • Heating output up to 3000 kW • Connection voltage max. 690 V • Ambient temperature -50/ + 60 °C • Heating up to +600 °C | <ul style="list-style-type: none"> • Combustible / heating gases • Industrial gases (e.g. air / nitrogen) • Heating, heat transfer and lubrication oils • Fresh water and extinguishing water • Glycol-water mixtures • Crude oil / hydrocarbons / fluids • Superheated steam |
| Pressure vessel/heating element materials | Production / design codes |
| <ul style="list-style-type: none"> • Incoloy 800/825 (1.4876 / 2.4858) • Stainless steel 1.4404 (AISI 316L) • Inconel 600 / 625 • Stainless steel 1.4541 (AISI 321) • Stainless steel 1.4571 (316 Ti) | <ul style="list-style-type: none"> • PED 97/23/EG • ASME VIII Div. 1/2 • AD2000 notices • Ship classifications: DNV Det Norske Veritas LR Lloyds Register; BV Bureau Veritas, GL Germanischer Lloyd • GOST • SQL / SELO (China) |

**Electric flow heater
Type STR-TWIN**

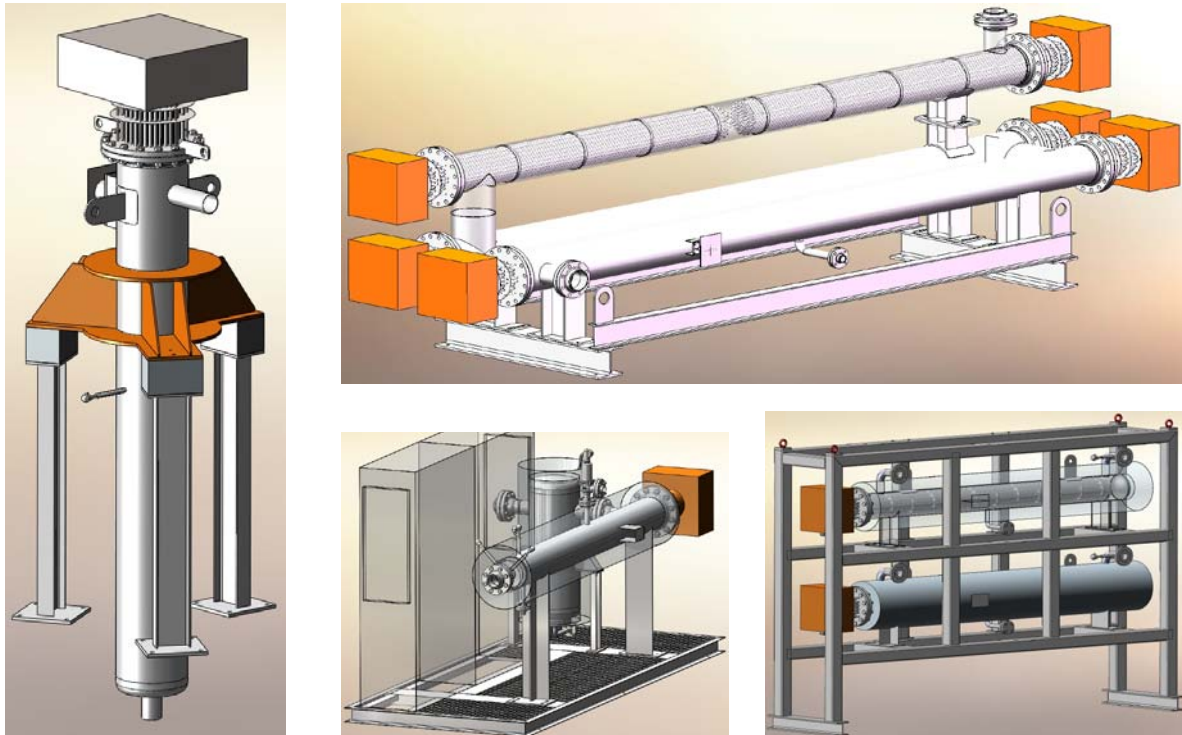


Description

The STR-TWIN series of electric flow heaters is suitable for use for the heating of liquid media or pressurised gases (such as air / oxygen / nitrogen) with low volume or mass flows and for high medium temperatures up to 600 °C. These heaters are manufactured to customer specifications. These process heaters carry the CE designation in compliance with the current CENELEC standards, and also comply with the applicable IEC standards.

| Key data | Typical application areas |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Process flanges to DIN / ANSI • Pressure level up to PN160 / 2500 lbs • Heating output up to 1500 kW • Connection voltage max. 690 V • Ambient temperature -50/ + 60 °C • Heating up to +600 °C | <ul style="list-style-type: none"> • Combustible / heating gases • Industrial gases (e.g. air / nitrogen) • Heating, heat transfer and lubrication oils • Fresh water and extinguishing water • Glycol-water mixtures • Crude oil / hydrocarbons / fluids • Superheated steam |
| Pressure vessel/heating element materials | Production / design codes |
| <ul style="list-style-type: none"> • Incoloy 800/825 (1.4876 / 2.4858) • Stainless steel 1.4404 (AISI 316L) • Inconel 600 / 625 • Stainless steel 1.4541 (AISI 321) • Stainless steel 1.4571 (316 Ti) | <ul style="list-style-type: none"> • PED 97/23/EG • ASME VIII Div. 1/2 • AD2000 notices • Ship classifications: DNV Det Norske Veritas LR Lloyds Register; BV Bureau Veritas, GL Germanischer Lloyd • GOST • SQL / SELO (China) |

**Electric process heater - System
Type ANL**

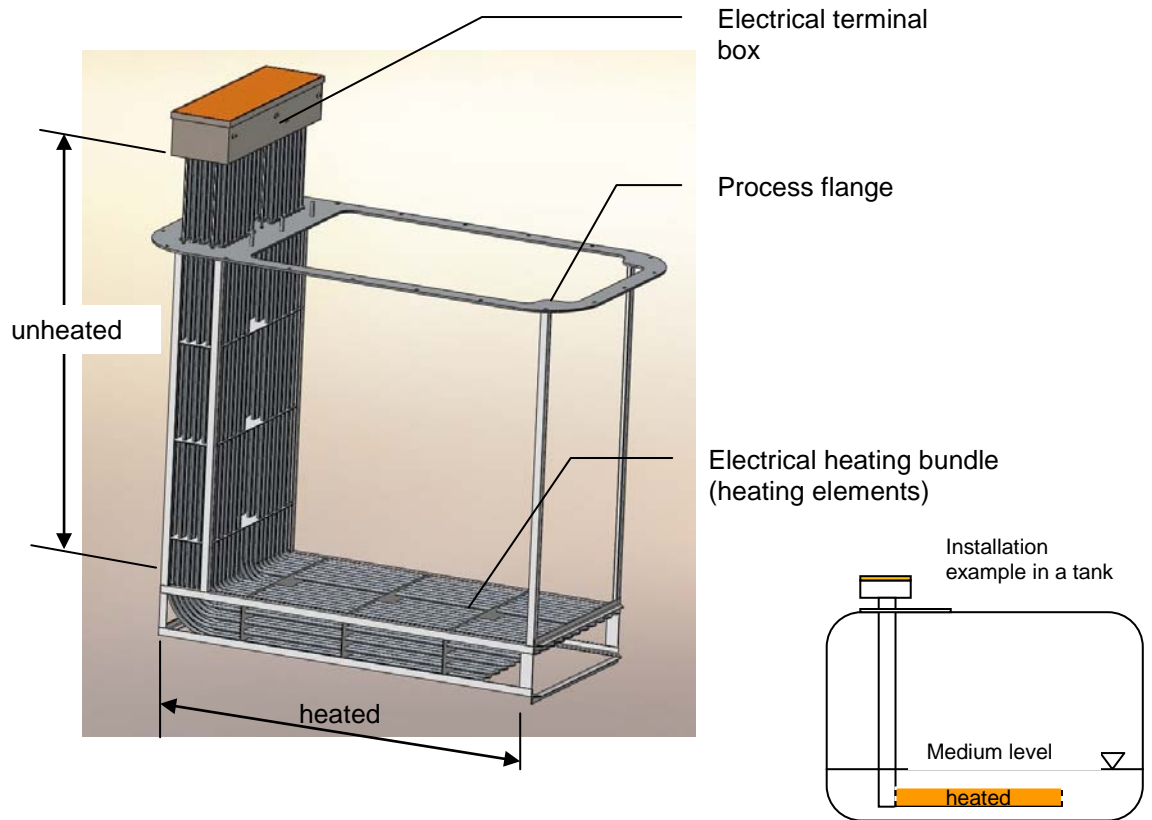


Description

The ANL series of system electric process heaters is suitable for use for the heating of (pressurised) gases and fluids in the industrial environment, and is manufactured to customer specifications. These process heaters carry the CE designation in compliance with the current CENELEC standards, and also comply with the applicable IEC standards.

| Key data | Typical application areas |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Process flanges to DIN / ANSI • Pressure level up to PN160 / 2500 lbs • Heating output up to 4000 kW • Connection voltage max. 690 V • Ambient temperature -50/ + 60 °C • Heating up to +600 °C | <ul style="list-style-type: none"> • Combustible / heating gases • Industrial gases (e.g. air / nitrogen) • Heating, heat transfer and lubrication oils • Fresh water and extinguishing water • Glycol-water mixtures • Crude oil / hydrocarbons / fluids • Superheated steam |
| Pressure vessel/heating element materials | Production / design codes |
| <ul style="list-style-type: none"> • Incoloy 800/825 (1.4876 / 2.4858) • Stainless steel 1.4404 (AISI 316L) • Inconel 600 / 625 • Stainless steel 1.4541 (AISI 321) • Stainless steel 1.4571 (316 Ti) | <ul style="list-style-type: none"> • PED 97/23/EG • ASME VIII Div. 1/2 • AD2000 notices • Ship classifications: DNV Det Norske Veritas LR Lloyds Register; BV Bureau Veritas, GL Germanischer Lloyd • GOST • SQL / SELO (China) |

Electric flange heater Type FHK-L

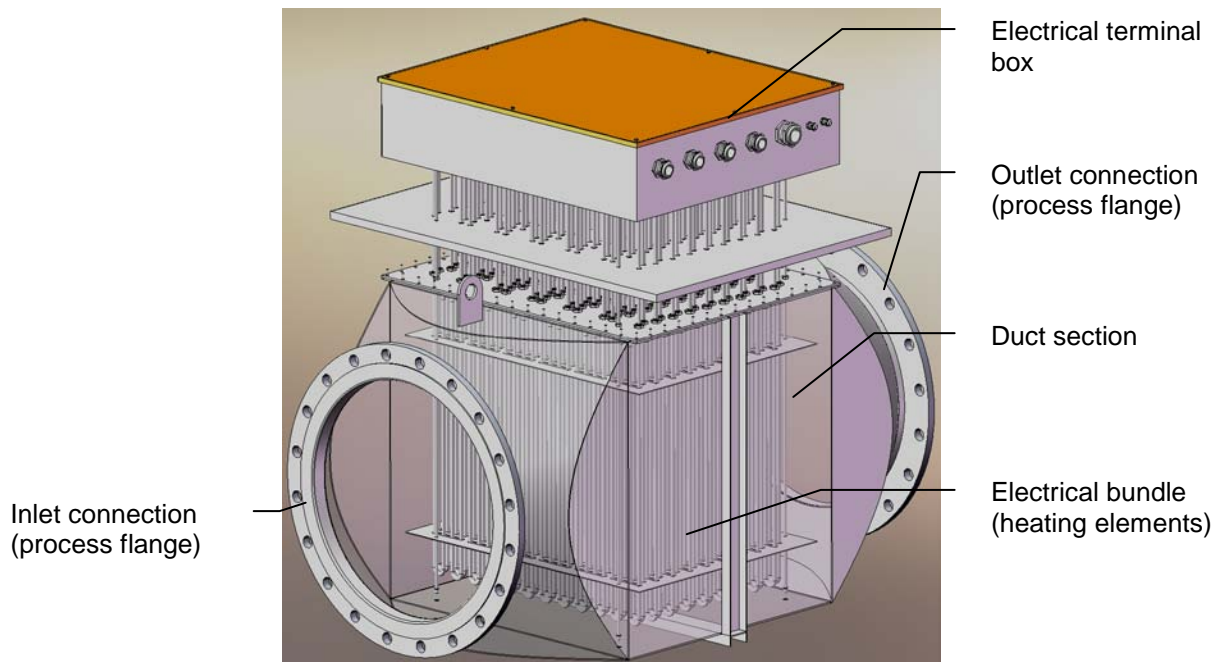


Description

The FHK-L series of electric flange heaters offers a solution for the heating of fluids / molten salts or similar applications in process tanks or underground containers. Containers with very low filling levels can also be heated, since only the lower horizontal area is heated. The flange heater consists of a number of heating elements, which are installed into the process flange. The electrical connection takes place in a robust Electrical terminal box.

| Key data | Typical application areas |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Process flange to DIN / ANSI • Heating output up to 1500 kW • Connection voltage max. 690 V • Ambient temperature -50/ + 60 °C • Heating up to +600 °C | <ul style="list-style-type: none"> • Pre-heating of oil / water / glycol • Process heating • Cleaning and flushing tanks • Heat transmission systems • Boiler equipment • Frost protection • Molten salts |
| Process flange/heating elements materials | Production / design codes |
| <ul style="list-style-type: none"> • Incoloy 800/825 (1.4876 / 2.4858) • Stainless steel 1.4404 (AISI 316L) • Inconel 600 / 625 • Stainless steel 1.4541 (AISI 321) • Stainless steel 1.4571 (316 Ti) | <ul style="list-style-type: none"> • AD2000 notices • Ship classifications: DNV Det Norske Veritas LR Lloyds Register; BV Bureau Veritas, GL Germanischer Lloyd • GOST • SQL / SELO (China) |

**Electric duct air heater
Type LEH-R**

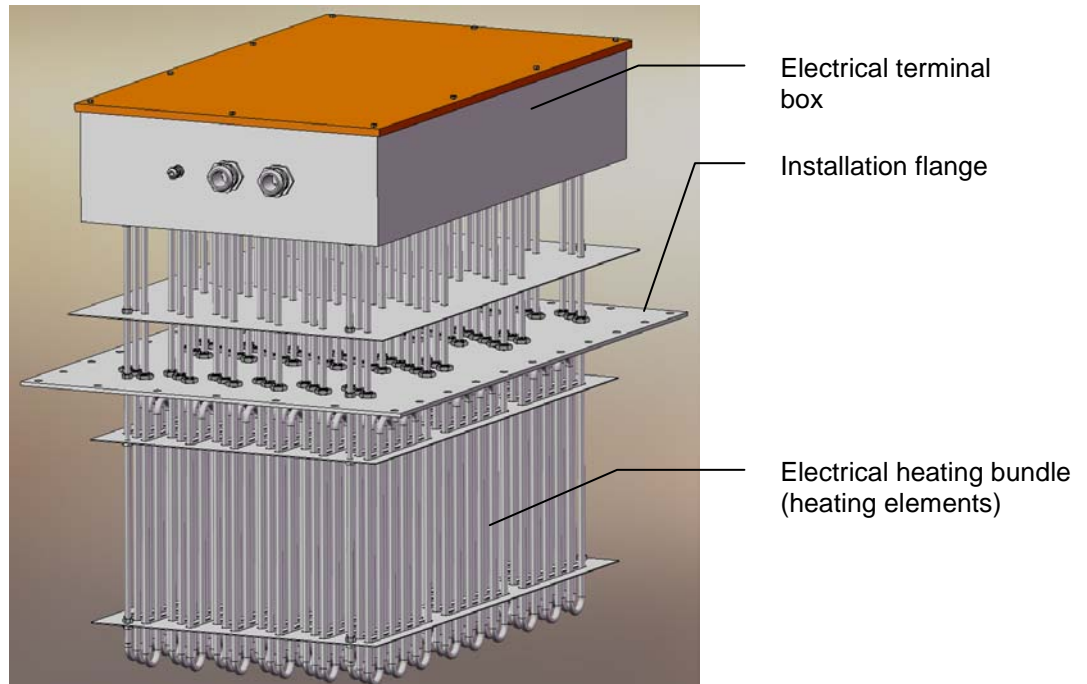


Description

The LEH-R series of electric duct air heaters is suitable for use for the heating of gases (e.g. air / nitrogen / flue gases) in the industrial environment, and is manufactured to customer specifications. These heaters are designed as standard with round flange connection to DIN EN 1092 on the inlet and outlet side (smooth collar with welding-neck flanges). These air heaters carry the CE designation in compliance with the current CENELEC standards, and also comply with the applicable IEC standards.

| Key data | Typical application areas |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Process flanges to DIN / ANSI • Pressure level up to PN10 (Standard) • Heating output up to 1500 kW • Connection voltage max. 690 V • Ambient temperature -50/ + 60 °C • Heating up to +600 °C • Operating pressure max. 200 mbar | <ul style="list-style-type: none"> • Ventilation / air-conditioning technology • Heat recovery • Process/environmental technology, catalytic afterburning • Drying furnaces, paint drying, cereal drying • Plastic / textile / paper / glass industry • Engineering • Foodstuffs industry • Filter heating for gas turbines |
| Channel section/heating element materials | Production / design codes |
| <ul style="list-style-type: none"> • Incoloy 800/825 (1.4876 / 2.4858) • Stainless steel 1.4404 (AISI 316L) • Inconel 600 / 625 • Stainless steel 1.4541 (AISI 321) • Stainless steel 1.4571 (316 Ti) | <ul style="list-style-type: none"> • AD2000 notices • Ship classifications: DNV Det Norske Veritas LR Lloyds Register; BV Bureau Veritas, GL Germanischer Lloyd • GOST • SQL / SELO (China) |

**Electric air heater
Type LEH-A**

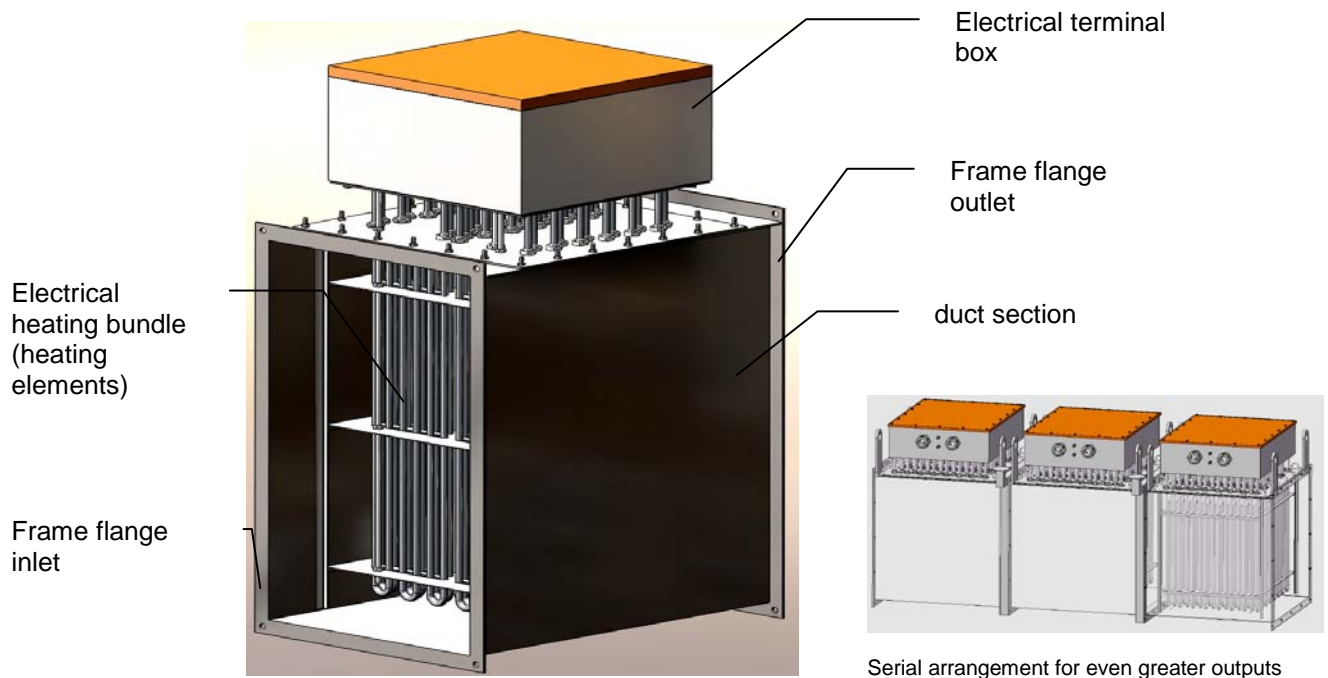


Description

The LEH-A series of electric air heaters is suitable for use for the heating of gases (e.g. air / nitrogen / flue gases) in the industrial environment, and is manufactured to customer specifications. These heaters are designed with a strong installation flange. These air heaters carry the CE designation in compliance with the current CENELEC standards, and also comply with the applicable IEC standards.

| Key data | Typical application areas |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Strong installation flange • Heating output up to 1500 kW • Connection voltage max. 690 V • Ambient temperature -50/ + 60 °C • Heating up to +600 °C • Operating pressure max. 200 mbar | <ul style="list-style-type: none"> • Ventilation / air-conditioning technology • Heat recovery • Process/environmental technology, catalytic afterburning • Drying furnaces, paint drying, cereal drying • Plastic / textile / paper / glass industry • Engineering • Foodstuffs industry |
| Channel section/heating element materials | Production / design codes |
| <ul style="list-style-type: none"> • Incoloy 800/825 (1.4876 / 2.4858) • Stainless steel 1.4404 (AISI 316L) • Inconel 600 / 625 • Stainless steel 1.4541 (AISI 321) • Stainless steel 1.4571 (316 Ti) | <ul style="list-style-type: none"> • AD2000 notices • Ship classifications: DNV Det Norske Veritas LR Lloyds Register; BV Bureau Veritas, GL Germanischer Lloyd • GOST • SQL / SELO (China) |

**Electric duct air heater
Type LEH-K**

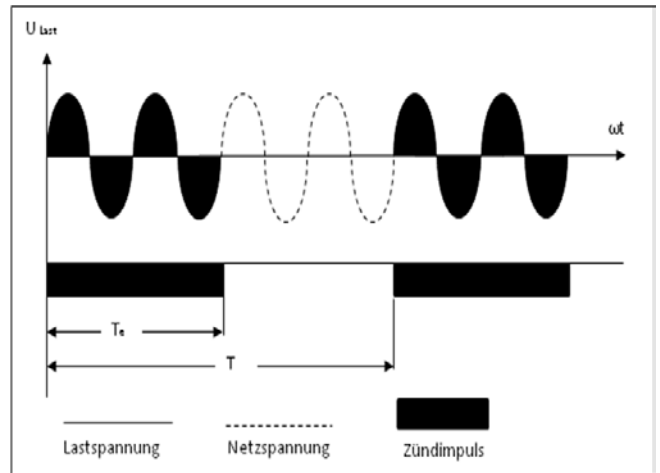


Description

The LEH-K series of electric duct air heaters is suitable for use for the heating of gases (e.g. air / nitrogen / flue gases) in the industrial environment, and is manufactured to customer specifications. These heaters are designed as standard with a strong surrounding frame flange on the inlet and outlet side. These air heaters carry the CE designation in compliance with the current CENELEC standards, and also comply with the applicable IEC standards.

| Key data | Typical application areas |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Strong frame flange • Heating output up to 1500 kW • Connection voltage max. 690 V • Ambient temperature -50/ + 60 °C • Heating up to +600 °C • Operating pressure max. 200 mbar | <ul style="list-style-type: none"> • Ventilation / air-conditioning technology • Heat recovery • Process/environmental technology, catalytic afterburning • Drying furnaces, paint drying, cereal drying • Plastic / textile / paper / glass industry • Engineering • Foodstuffs industry • Filter heating for gas turbines |
| Channel section/heating element materials | Production / design codes |
| <ul style="list-style-type: none"> • Incoloy 800/825 (1.4876 / 2.4858) • Stainless steel 1.4404 (AISI 316L) • Inconel 600 / 625 • Stainless steel 1.4541 (AISI 321) • Stainless steel 1.4571 (316 Ti) | <ul style="list-style-type: none"> • AD2000 notices • Ship classifications: DNV Det Norske Veritas LR Lloyds Register; BV Bureau Veritas, GL Germanischer Lloyd • GOST • SQL / SELO (China) |

**Electric control panels
Type SCH**



Pulse group operation for ohmic load

In pulse group operation, complete sinus sequences of the mains voltage are either switched through or blocked. In this operating mode, the output at the consumer is dosed via the cycle ratio. Since ignition takes place only at the relevant zero-values, the operation produces only low radio interference.

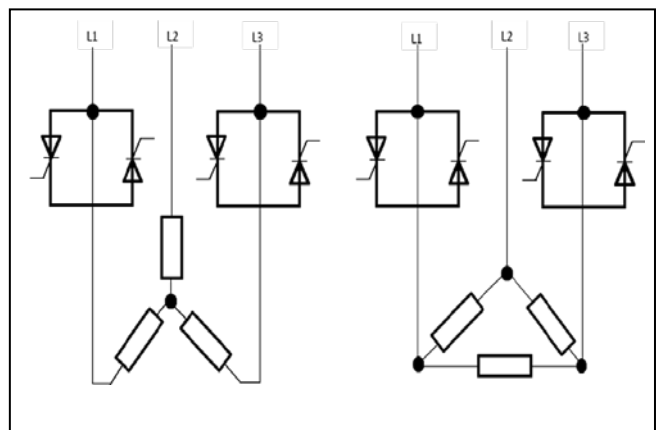
$$\text{Cycle ratio} = \frac{\text{Switch-on time } T_e}{\text{Cycle time } T}$$

Economy switching for ohmic loads

In a three-phase system without MP, so-called economy switching can be built up using only two single-phase thyristor power controllers, dispensing with the third thyristor power controller. The load (star or triangle) is operated at phase L1 and L3 via a thyristor power controllers. Phase L2 is connected direct to the load.

Description

Large outputs can be supplied as pure stage switches (single- or multi-stage) or in a combination of switch stages and thyristor control (pulse group operation).



Key data

- Planning of thyristor controls
- Stage switching with sequence control
- PLC programming
- Production
- Works test and quality control (FAT)
- On-site commissioning
- Spare parts procurement and delivery

Mechanical design

- Welded steel plate design of the housing
- Wall- or floor-mounted switch cabinet
- Powder-coated painting in RAL 7035
- Protection type IP 55 to EN 60529, NEMA 12
- Standing version with 100 or 200 mm switch cabinet base

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