

# SAN<sup>®</sup>

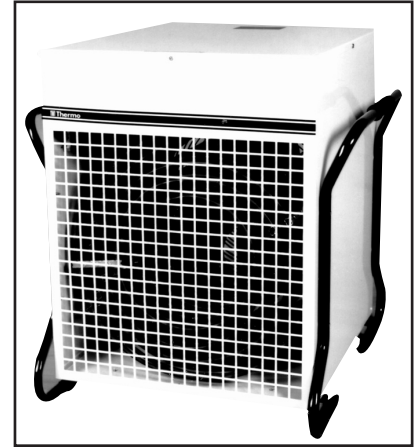
Electro Heat



## **Air Heating**

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## Portable Hot Air Fans Type TEA



Type **TEA** is used for heating of bigger rooms. It has 3 heating levels, protection class IP 44 and is delivered with 2 m cable. It is equipped with 2 limiters, one with automatic reset, one with manual reset. The fan has a built-in overheating fuse, which automatically starts the fan after over-heating.

Type TEA 15-32 can all be connected in 3 levels.  
TEA 40 can be connected in 4 levels.

Type	Power kW	Voltage V	Current Amp	Air volume m <sup>3</sup> /h	Δt °C	Weight kg	Part no.
TEA 15	15	3x400	22	1300	33	17	83400
TEA 26	26	3x400	38	2900	25	30	83402
TEA 32	32	3x400	47	2900	33	32	83404
TEA 40	40	3x400	59	2900	40	34	83406

## For rooms with danger of fire Type BSP

Type **BSP** is especially designed for use in rooms with minor danger of fire. This can e.g. be farming, carpenter's and joiner's workshops. Not applicable for rooms containing huge masses of dust. NON EX.

### Technical data:

Protection class: IP 54. The fan is protected by a thermo release, which switches off the fan and heating elements. The heating elements are protected against over-heating by a limiter.

Type **BSP** is equipped with no-voltage release. At drop outs the hot air fan can only be started manually by a push button. Lowest distance to flammable material: 1.0 m.

Delivered with 10 m rubber cable and plug.

Type BSP is also available for stationary mounting

Type	Power kW	Voltage V	Current Amp	Air volume m <sup>3</sup> /h	Δt °C	Weight kg	Part no.
BSP 2	2	230	9	400	14	6	83335
BSP 4	4.5	3x400	7	950	14	15	83336
BSP 6	6	3x400	9	950	18	16	83337
BSP 9	9	3x400	13	1300	21	17	83338

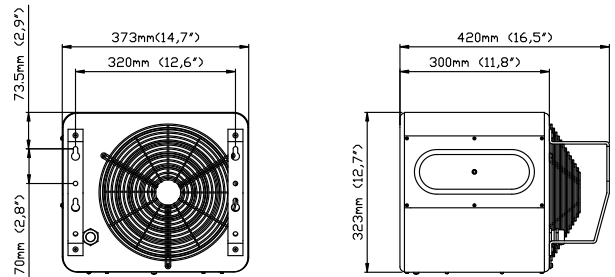


**SAN**® Electro Heat a/s

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CVR No.: 42 16 59 13 - A/S reg. No.: 53 053



### Description

This fan heater is a rigid and reliable fan heater designed for harsh weather and rough environments, where fine materials and high performance are required for nacelle heating and others.

The fan heater is performing superbly down to -40°C and in high altitude. This heater is therefore the perfect choice for high quality wind turbines in cold climate conditions.

The technology has been used successfully for more than 15 years and ongoing development secures that these products still perform as quality units in the next generation of turbines.

The UL approved heaters can be supplied from 3-9kW as standard.

The heater is supplied with wall bracket.

### Technical Data

A limiter is installed for safety against overheating. The fan heater is designed with an inner round shell which ensures that the entire air flow passes over the heating elements. In this way problems with cold areas and stalling airflow are avoided.

The fan heater is supplied in different voltages, therefore all types are available from 240 V - 600 V.

NEMA 2 cover.

### Coating

The fan heater is made of electrogalvanized steel plates coated with a 20 my coating in RAL 7004 (light grey). When ordering large quantities the fan heaters can be supplied in other colours.

### Permanent Installation

Using the wall bracket the fan heater can be mounted vertically or in a 15° angle.

### Electrical Installation

Permanent installation must be carried out by an authorised electrician in compliance with current regulations.

kW	Volt	Amp	m <sup>3</sup> /h ⚙	Δ T ■	dB(A)	Part no.
3	240	12,5	450	19°C	35	69825309
4,5	240	18,8	650	20°C	42	69825090
3	3x240	7,2	450	19°C	35	69825308
6	3x240	14,4	650	28°C	42	69825307
3	3x400	4,3	450	19°C	35	69825306
6	3x400	8,7	650	28°C	42	69825305
9	3x400	13,0	800	32°C	45	69825304
3	3x480	3,6	450	19°C	35	69825303
6	3x480	7,2	650	28°C	42	69825302
9	3x480	10,8	800	32°C	45	69825099
3	3x600	2,9	450	19°C	35	69825301
6	3x600	5,8	650	28°C	42	69825300
9	3x600	8,7	800	32°C	45	69825089

## Fan Heater 3kW-21kW



### Description

This fan heater is a rigid and reliable fan heater designed for harsh weather and rough environments, where fine materials and high performance are required for nacelle heating and others.

The fan heater is performing superbly down to  $-40^{\circ}\text{C}$  and in high altitude. This heater is therefore the perfect choice for high quality wind turbines in cold climate conditions.

The technology has been used successfully for more than 15 years and ongoing development secures that these products still perform as quality units in the next generation of turbines.

### Technical Data

The fan heater is supplied with a  $0 - 40^{\circ}\text{C}$  thermostat

which ensures an optimum service and minimises the electrical consumption. A limiter is also installed for safety against over heating. The fan heater is designed with an inner round shell which ensures that the entire air flow passes over the heating elements. In this way problems with cold areas and stalling airflow are avoided.

The fan heater can be delivered in different voltages 110V - 690V.

Degree of protection: IPx4.

### Options

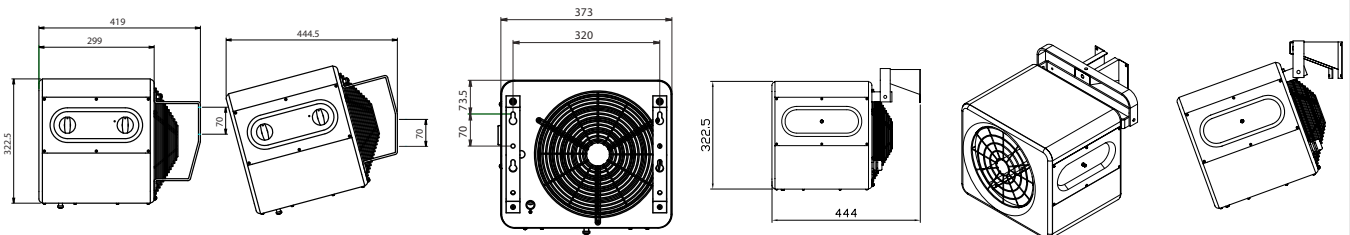
- can be delivered with different wall bracket systems.
- can be delivered with different cable lengths.



### Coating

The fan heater is made of electrogalvanized steel plates coated with a 20 my coating in RAL 7004 (light grey). When ordering large quantities the fan heaters can be supplied in other colours.

### Electrical Installation

Permanent installation must be carried out by an authorised electrician in compliance with current regulations.



Description	Volt	kW	$\text{m}^3/\text{h}$ 	$\Delta T$ 	dB(A)
3000	230	3	450	$19^{\circ}\text{C}$	35
3000	3x400/690	3	450	$19^{\circ}\text{C}$	35
6000	3x400/690	6	650	$28^{\circ}\text{C}$	42
9000	3x400/690	9	800	$32^{\circ}\text{C}$	45
15000*	3x400/690	15	1400	$30^{\circ}\text{C}$	52
21000*	3x400/690	21	1400	$42^{\circ}\text{C}$	52

\*Dimensions have to be informed.

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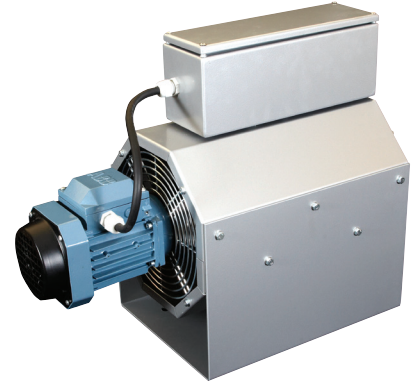
**Application:**

Hot air fan for heating and temperature maintenance in the nacelle. All equipment is delivered approved according to international standards, including corrosion-, shock- and vibration tests.

**Technical data:**

Output:	5-50kW
Voltage:	110 - 3x690V
Volume of gas:	7m/s
Op. temperature:	-40 to +55°C
Casing:	IP 55
Composition:	Stainless steel
Part No.:	10kW: 217252001 5kW: 207406001 and 207406002

## SAN Air Heater for wind turbines



### Description:

SAN special designed air heater for frost protection in wind turbines manufactured from galvanized steel consisting of a hexagonal duct with forced ventilation from a built-on fan.

The terminal box is made from painted steel, with enclosure IP65, containing electrical components and terminations.

The heater unit has heavy mounting fixtures in galvanized steel mounted to the surface for fixture in the right position in the wind turbine.

The built-in heating elements are made from stainless steel AISI 316Ti and bent into shape to secure perfect heat transportation from the heating element into the air.

The air heater is overheat protected by an adjustable limiter with reset located near the surface of the heating elements.

All equipment is approved according to international standards, including corrosion, shock and vibration tests.

### Technical data:

	Type I	Type II	Optional
Output	5kW	10kW	2,5kW - 50kW
Voltage	3x690V	3x690V	3x400V - 3x690V
Air flow	2500m <sup>3</sup> /h	2500m <sup>3</sup> /h	800m <sup>3</sup> /h -
Temperature range	-40 to +55°C	-40 to +50°C	-40 to +50°C
Protection class	IP65	IP65	IP65
Casing	Galvanized steel	Galvanized steel	Galvanized/Stainless steel
Motor rpm	1380	1380	750 - 3000

### Application:

Nacelle heating - Tower heating





SAN hot air curtains is especially designed for use over front doors and smaller gates, but is also applicable for many other applications, e.g. for heating and drying in the industry.

Delivered with power from 2 kW to 10 kW, where the 2 kW type, LPX 2, is especially applicable for minor openings, such as e.g. hot-dog stands, serving hatches etc.

### Description of type LPX2

Manufactured from galvanized steel plate with drum fan and stainless pipe heating elements.

2-level switches for air volume and power (1/2 - 1/1).

Thermostat and thermo relay with manual reset (behind the front cover).

2 m wire with plug. Protection class: IP 20. Sound level: 40/48 dB.

Thermostat: 5°C-35°C. Colour: RAL 9010 (white). Voltage: 230 V.

Width: 800 mm.

For use at front doors, e.g. in airports, gas stations etc. the heavier types, LSK are recommended. At wide door openings, e.g. at malls or industrial gates, the type RA is recommended.

### Description of type LSK

Manufactured from galvanized steel plate with drum fan and stainless tubular heating elements. Equipped with complete adjustment: 0 - vent. - heating level 1 + 2, thermostat 0°C-40°C and 2 limiters. Protection class: IP 20. Sound level: 42/53 dB(A).

Colour: RAL 9010 (white).

Voltage: 3x400 V

Type LSK = 1 m wide. Type LSD = 1.5 m wide. H: 270 mm, D: 240 mm.

Type	Power kW	Air volume m <sup>3</sup> /h	Δ T °C	Weight	Part no.
LPX 2	2	230/460	25/13	9	83339
LSK 3	3	900/1200	10/7	15	83340
LSK 6	6	900/1200	19/4	15	83341
LSK 9	9	900/1200	29/21	15	83342

For type LSK - LSD a remote control box can be delivered, which can adjust up to 6 hot air blankets. Temperature control still on each unit.

BB Separate control box	83339
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## Air Curtains Type RA

### Description

In principle the type RA recirculates the existing, heated air in the room, which is let out through adjustable plates at high speed. This way an effective air stop is obtained and at the same time the temperature difference between ceiling and floor is equalized.

Type RA can also be delivered with heating unit, either for central heating (up to 69 kW) or with electrical surface (up to 36 kW).

It is necessary to dimension type RA depending on the actual assignment. Please contact our sales department.



**SAN** round electrical heaters have been designed for building-into spiro ducts. They are manufactured from hot galvanized steel plate mounted with stainless steel tubular heating elements and equipped with terminal box with BK gland for each group.

With built-in temperature limit type TGS 140°C with manual reset and fire thermostat with automatic reset.

Specific watt load : 3 W/cm<sup>2</sup>

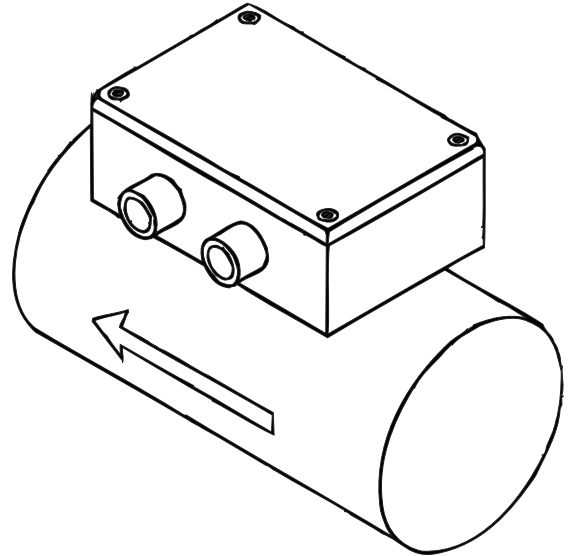
Min. wind velocity : 3 m/sec.

### ELECTRICAL HEATER RVF

3 x 400 V

Type	Power kW	Dimensions ØD x L mm	Part no.
RVF 16/36	3.6	160 x 250	55500
RVF 16/54	5.4	160 x 250	55510
RVF 16/72	7.2	160 x 250	55515
RVF 25/87	8.7	250 x 350	55520
RVF 25/116	11.6	250 x 350	55525
RVF 25/145	14.5	250 x 350	55530
RVF 25/174	17.4	250 x 350	55535
RVF 315/210	21.0	315 x 550	55540
RVF 315/280	28.0	315 x 550	55543
RVF 315/350	35.0	315 x 550	55545

### Type RVF



SAN electrical heaters are manufactured from stainless tubular heating elements, mounted in galvanized sheet iron frame with 30 mm flanges and equipped with terminal box and BK gland for each group.

With built-in temperature limit type TGS 140°C with manual reset and fire thermostat with automatic reset.

Specific watt load : 3 W/cm<sup>2</sup>

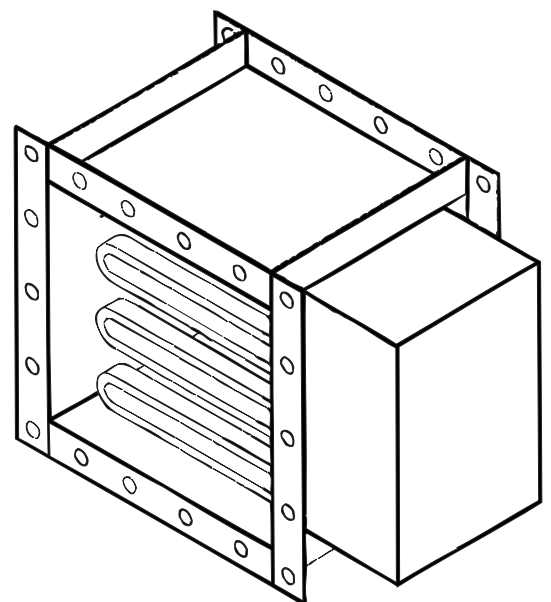
Min. wind velocity : 3 m/sec.

### ELECTRICAL HEATER FKV

3 x 400 V

Type	Power kW	Dimensions H x W x L mm	Part no.
FKV-3/1	4.50	300 x 300 x 300	50450
FKV-3/3	6.75		50675
FKV-3/5	9.00		50900
FKV-3/7	18.00		51800
FKV-4/1	11.25	400 x 400 x 425	51125
FKV-4/3	18.00		51801
FKV-4/5	27.00		52700
FKV-4/7	38.25		53825
FKV-5/1	24.75	500 x 500 x 500	52475
FKV-5/3	47.25		54725
FKV-5/5	76.50		57650

### Type FKV



Group division according to request. Each group must be multiple of 2.25 kW.

As tubular heating element, our standard types in stainless and acid proof steel are most often used, however, on demand, tube material MONELL 400, INCOLOY 800, INCONEL 600 or TITANIUM are used.

Duct frame is in equal material.

## Insertion Heaters Type RKV for duct heating

**SAN** insertion heaters are for mounting in ventilation systems with spiro ducts. FOR TEMPERATURES UP TO MAX. 60°C.

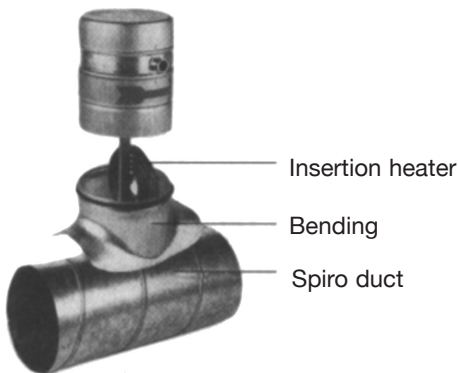
**SAN** insertion heaters can be mounted and after-mounted on all spiro ducts by means of an application - easily and simple.

**SAN** insertion heater is manufactured from hot galvanized steel plate with normal tight terminal box, with 2 PG 13.5 and terminal box for electrical connection. The heating element is in acid proof, stainless steel Werkstoff-No. 1.4435.

**SAN** insertion heater is equipped with over-heat protection consisting of 1 bi-metal thermostat with automatic reset and 1 temperature limit, 1-pole with reset for manual reset in separate thermo well.

**SAN** insertion heater can be reset to 4 different effects.

Ⓓ DEMKO approved.



### INSERTION HEATERS RKV

Type	Power W	Part no.
RKV 16	500/1000/2000 W - 230 V	30510
RKV 25	1500 W - 400 V	30516

**Type RKV 16:** Ø160 for mounting in spiro pipe 160 and 200, height = 145 mm

**Type RKV 25:** Ø250 for mounting in spiro pipe 250 and 315, height = 155 mm

**Air velocity:**

500 W - 230 V:	min. 0.5 m/sec.
1000 W - 230 V:	min. 1.0 m/sec.
1500 W - 400 V:	min. 1.5 m/sec.
2000 W - 230 V:	min. 2.0 m/sec.

Other sizes, power and voltages are delivered according to specification.

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## Electro Heat

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- Heating Pads
- Flow Heaters
- Air Duct Heaters
- High-voltage
- Resistors
- Controllers



With more than 50 years of experience SAN Electro Heat's most valuable asset is special knowhow 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 supplier of the final product. At the same time we insure and maintain the required quality level, mechanical and electrical dimensioning, approvals and documentation.



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