

SAN[®] Electro Heat Process **HEATING**



Air Heating

Gillelejevej 30

DK-3230 Graested

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Member of the NIBE Group

SAN[®]

Electro Heat

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

8. AIR HEATING

Hot air fans

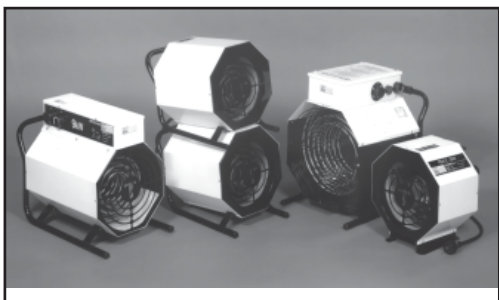
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Electrical heaters for duct heating

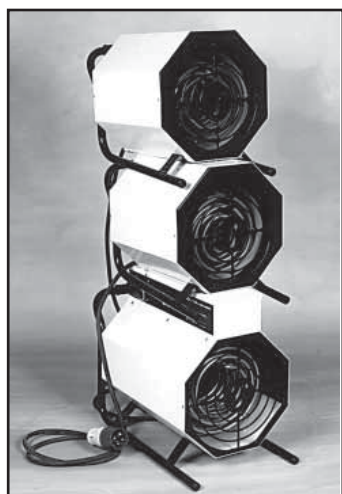
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PORTABLE HOT AIR FANS type PEA and TEA



PEA



TEA

SAN's new programme of portable hot air fans and stationary mounted hot air blankets are the result of many years of experience and research in cooperation with our customers. The programme contains the following main groups:

- **Portable hot air fans**
- **Stationary hot air fans**
- **Air blankets for doors and gates.**

Type **PEA** is a very robust hot air fan, which is used for heating and drying in building and construction, stock and workshops etc.

Operation: PEA 3, 6 and 9 kW have an adjustment button with setting:

OFF - fan - heating level 1 (50%) - heating level 2 (100%).

The room thermostat can be set between 0°C and 40°C.

When set on heating level 2, the thermostat automatically chooses level 1 or 2.

PEA 2 kW has only ON/OFF thermostat and heating level 1.

PEA 3, 6 and 9 kW can also be mounted on the wall.

Delivered with cable and plug (PEA 2 + 3 + 6).

PEA 9 has CEE equipment plug input.

All models are equipped with limiter. Protection class: IP 44.

PEA 2 and 3 are delivered with 2 m GK and earthed plug.

PEA 6 is delivered with 2 m GK and CEE plug.

PEA 9 is delivered with 16 A CEE equipment inlet.

Type	Power kW	Voltage V	Current Amp	Air volume m ³ /h	Δt °C	Weight kg	Part no.
PEA 2	2	230	9	300	19	7	83325
PEA 3	3	3x400	5	400	21	10	83326
PEA 6	6	3x400	9	400	43	11	83327
PEA 9	9	3x400	13	600	43	12	83328
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

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 **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.

For rooms with danger of fire

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	Power kW	Voltage V	Current Amp	Air volume m ³ /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

Type BSP also available for stationary mounting.

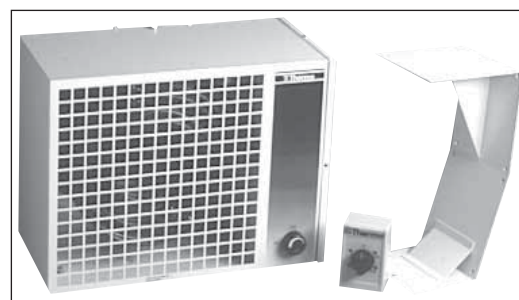
For stationary mounting e.g. in industrial- and stocking areas, workshops and sports halls the series **EVR** is a good choice. Combined with mixing dampers, good ventilation conditions are obtained.

Hot air fans for stationary mounting

Type **EVR 3** has a 2-phase fan. **EVR 4** has a 3-phase.

Automatics for adjustment of heating elements and fan are pre-connected in the cabinet. Thermostat 0-40°C is mounted. Adjustment is made through a separate automatic box type RP (optional equipment). This can adjust up to 6 air fans. Level: 0 - fan - heating level I - II - III.

Protection class: IP 44. Wall fittings incl.



3x400 V

Type	Power kW	Current Amp	Air volume m ³ /h	Δt °C	Weight kg	Part no.
EVR 303	3	5	950/1300	9/7	12	83368
EVR 306	6	9	950/1300	19/14	12	83369
EVR 309	9	13	950/1300	28/21	13	83370
EVR 312	12	18	950/1300	38/28	14	83371
EVR 315	15	22	950/1300	35	15	83372
EVR 425	26	38	2900	40	28	83374
EVR 432	33	48	2900	33	30	83375
RP control box	For EVR					83349
BS 3 for EVR 3	Mixing trimmer					83408
BS 4 for EVR 4	Mixing trimmer					83410

Inlet screen and filtre can be delivered.

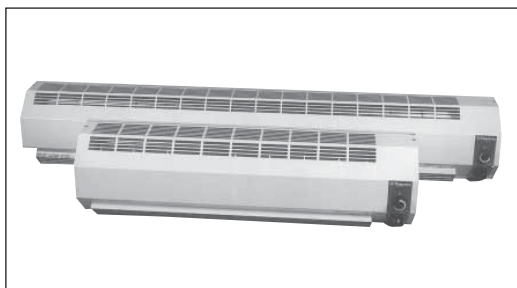
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AIR CURTAINS



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, i.e. LSK and LSD are recommended. At wide door openings, e.g. at malls or industrial gates, the type RA is recommended.

Description of type LSK - LSD

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 ³ /h	Δt °C	Weight kg	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
LSD 6	6	1400/1900	12/9	20	83343
LSD 9	9	1400/1900	18/14	20	83344
LSD 12	12	1400/1900	24/18	20	83345



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	83347
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Description of type RA

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/cm²

Min. wind velocity : 3 m/sec.

ELECTRICAL HEATER RVF 3 x 400 V

Type	Power kW	Dimensions ∅D 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

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/cm²

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	400 x 400 x 425	51800
FKV-4/1	11.25		51125
FKV-4/3	18.00		51801
FKV-4/5	27.00		52700
FKV-4/7	38.25	500 x 500 x 500	53825
FKV-5/1	24.75		52475
FKV-5/3	47.25		54725
FKV-5/5	76.50	57650	

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

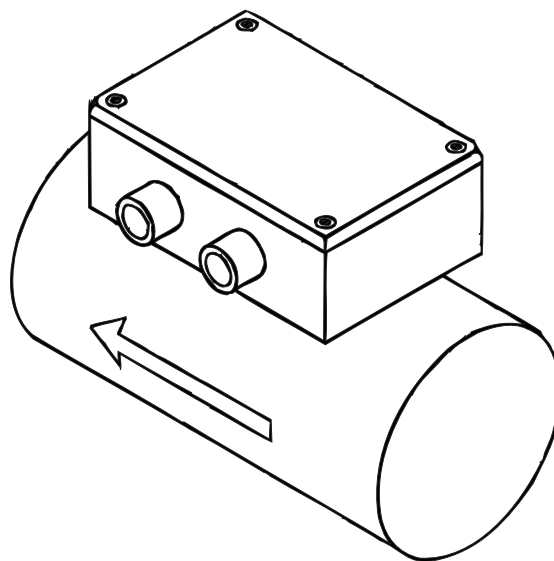
As tubular heating element, our standard types in stainless and acid proof steel are most often used, however, on demand, tube material MONELL 400, INCOLOY 800, INCONEL 600 or TITANIUM are used.

Duct frame is in equal material.

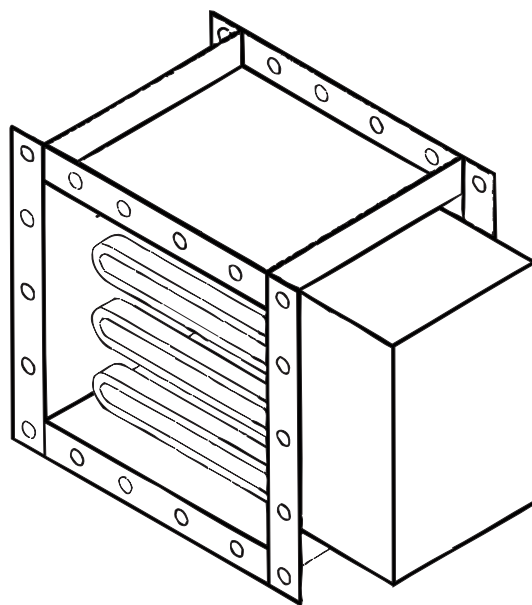
ELECTRICAL HEATERS

for duct heating

Type RVF



Type FKV



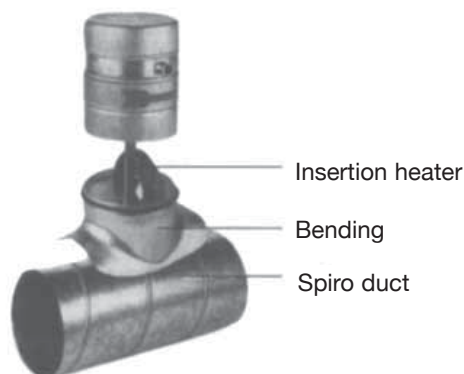
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INSERTION HEATERS Type RKV for duct heating



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.



Where fluid or gaseous materials are to be conveyed flexibly and without temperature loss, the heating hoses are the ideal solution.

The necessary temperatures, power and applications as well as choice of outer protection jacket decide, which heating hose technique is to be used.

In the analysis technique, e.g. waste combustion, refineries, chemical industry, engine exhaust measuring, etc, the gaseous medias are let from the outlet to a measuring equipment. Here the gasses are kept frost free, protected against condensing and the temperature maintenance is kept on approx. 200 - 250°C.

Other applications are in the warm gluing technique, PUR foaming plants, wax treatment, bitumen machining plants, machining of heavy fuel, food industry etc., where heating, temperature maintenance and conveyance without heat loss of similar medias must be secured.

Apart from standard products we solve customer specific assignments.

Upon request we can additionally offer heating hoses for Ex-dangerous areas.

HEATING HOSES - HEATED WIRES

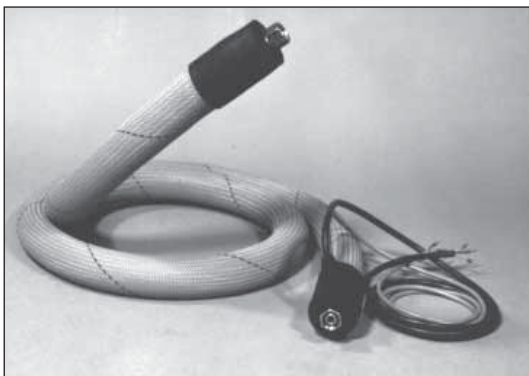
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HEATING HOSES - HEATED WIRES



Type ELH for gas analysis

Conveyance of gaseous medias from the outlet (e.g at shaft connections, a heated sampling probe or other) to a measuring equipment. Stationarily installed in plants or as portable systems.

Temperature ranges:

1. Frost protection
2. 0.....50°C
3. -10....200°C

Basis for application

1. There must not be any condensing in the gas, as this makes slurry and clogging.
2. Deviation of the gas temperature during conveyance falsifies the measuring result.
3. Prevention of excess of the dew point below temperature, especially at combustion gasses.

The dew point for H₂SO₄ lies depending on the sulphur content of the fuel between 100°C and 190°C.

Application examples:

Coal, oil and gas firing
Waste combustion - total hydrocarbon measuring
Process gasses in refineries and chemical industry
Room air monitoring
Measuring of engine exhaust gas on test stands
Frost protection in water analysis - water sampling

Type ELH for pipe systems with pressure

Heating, temperature maintenance and heat loss free conveyance of medias such as:

- Oil, fat, wax, resin, tar, dyes, water, carbon acid, synthetics, casting mass, glue, food, etc.

Temperature range: 0....250°C

Basis for application:

1. The media is only fluid at a certain temperature.
2. The media only reaches its specific machining characteristics at a certain temperature range.
3. The media can only be machined at a preset temperature.
4. The pipe line must be portable or flexible because of a mobile place of outlet.

Application examples:

Connection technique
Warm gluing plants, packaging-, adhesive- and labelling machines
Surface technique
Dosing, bitumen- and dye spraying plants
Food industry
Foam plants
Polyester foam plants
Epoxy resin plants
Washing plants, steam cleaning, pipe cleaning
Drain- and silo hoses.

Type ELH/a

Application:

Measuring of engine exhaust air / CO₂, NH₃, HCL measuring/air measuring/industrial glue gas/environment technique

Technical data:

Heat effect : 60 ... 150 W/m
 Length : 0.5 ... 70 m
 Nominal diameter : 4 ... 13 mm
 Op. temperature : Max. 250°C
 Voltage : 24/110/230/400 V
 Temperature sensor : Pt 100, thermo couple, PTC sensor.

Various types:

ELH/a : with permanent inner hose in teflon (PTFE)
 ELH/ad : with permanent inner hose with steel wire braiding and RSL fitting on both sides
 ELH/ak : with permanent inner hose in copper
 ELH/ae : with permanent inner hose in stainless steel

Type extension ELH/i : replacable PTFE inner hose
 Type extension ELH/T : outer protection "level safe" arched metal hose with PVC coating
 Type extension ELH/iT : replacable inner PTFE hose with "level safe" outer protection

Type ELH/md

Application:

Heating, temperature maintenance and conveyance of medias in: cold- and warm melting machines, labelling machines, dosing- and spray painting equipment, spray equipment for double glass windows, food industry, oil fuel pipes.

Technical data:

Heat effect : 85 ... 310 W/m
 Length : 0.5 ... 70 m
 Nominal diameter : 4 ... 100 mm
 Op. temperature : Max. 250°C
 Voltage : 230/400 V
 Temperature sensor : Pt 100, thermo couple, PTC sensor

Conveying medias e.g.:

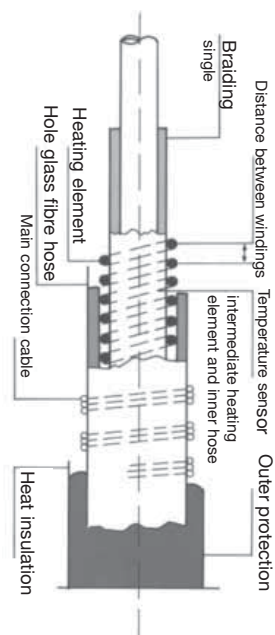
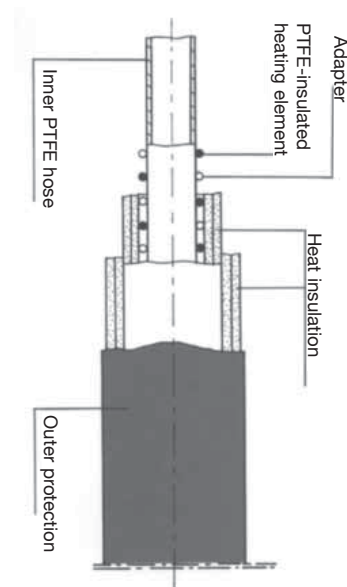
Oil, greasing, plastic, wax, glue, resin and tar, sealing mass and food.

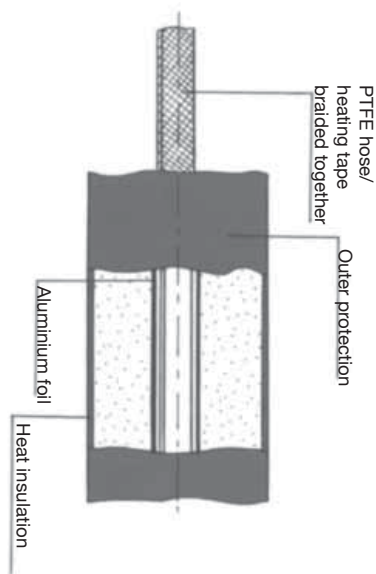
Fittings:

Steel chrome acid coated / stainless steel / Hastelloy / brass / see table for fittings.
 Max. op. pressure: 64 ... 260 bar, outer protection, e-connection, plug connection, control cables.

Type extension ELH/md/T : outer level safe, arched protection metal hose with PVC coating.

HEATING HOSES





Type ELH/sb

Application:

Analysis measuring technique up to 130°C / conveyance of fluids and gasses / frost protection / environment technique.

Technical data:

Heat effect : 13 ... 60 W/m
Length : max. ... 60 m
Nominal diameter : 4 ... 8 mm
Op. temperature : max. 130°C
Voltage : 230 V
Temperature sensor : Selfregulating, earth connected

Various types:

ELH/sb : with permanent inner hose in teflon (PTFE), ready for installation
ELH/sbA : with permanent inner hose in teflon (PTFE), not ready for installation
required length is cut from a reel by the customer

Type extension ELH/i: replacable inner PTFE hose

Type extension ELH/T: outer protection level safe arched metal hose with PVC coating

Type extension ELH/iT: replacable inner hose in PTFE and outer protection level safe.

Construction details for heating hoses type ELH/mb, /hd, /a, /sb



Temperature control and over-heating protection

PT 100, 2-, 3- and 4 cores
 Thermo element FeCuNi
 Thermo element NiCrNi
 PTC
 Temperature switch
 (off / on) 150°C ... 200°C
 Temperature fuse 150°C ... 200°C
 2 temperature sensors

Outer protection braiding:

Nylon black



Metal wave hose
with PVC coating



Mesh braiding, iron, galvanized or stainless steel



PA wave hose



Connection cable outlet:

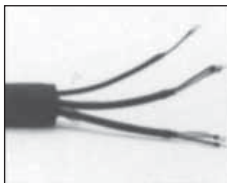
Lateral



Lateral in front



Front side



Returned

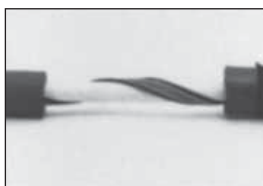


Combination



Signal cables in hose:

0.5 mm² ... 1.5 mm² up to max. 15 cores.
 Silicone- or teflon insulated as single core in a
 protection hose or cables lead out
 2-, 3- or 5-cores.



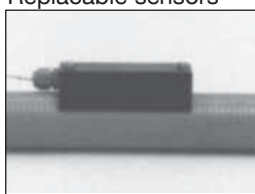
Plug connection



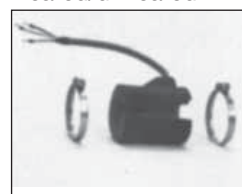
PG gland



Replacable sensors



Insulation jacket
heated/unheated



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- Immersion Heaters
- Church Heating
- Frost Protection
- Ex-Material
- Oil Radiators
- Drum Heaters
- Heating Mats
- 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.

