

# SAN<sup>®</sup>

Electro Heat



## Immersion Heaters

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## SAN Immersion Heaters for water heating etc. Type BL, BV, B

### Application:

The SAN immersion heaters are ordered by stating one or more part nos. The first part no. is always the immersion heater without terminal box and control. The second part no. states the type of terminal box, and the third part no. states the required control. Finally, the correct mounting kit should be stated.

For heating of water we recommend the below types BL, BV and B, which are constructed from tubular copper heating elements in a nickled version.

Please note: Type BL is with galvan ized sheet iron terminal box.

### BL 1" WRG                      230V                      8W/cm<sup>2</sup>                      with thermo well\*

Type	Power kW	Immersion length mm	Part no.
BL 5	0.5	150	84150
BL 10	1.0	250	84151
BL 15	1.5	400	84152
BL 20	2.0	650	84153

\* for thermostat 31919

### BV 1½ WRG                      3x230/400V                      8W/cm<sup>2</sup>                      with thermo well

Type	Power kW	Immersion length mm	Part no.
BV 20	2.0	275	84201
BV 30	3.0	275	84202
BV 45	4.5	400	84203
BV 60	6.0	500	84204
BV 75	7.5	650	84205
BV 90	9.0	750	84206
BV 120*	12.0	1000	84207

\* only for 3x400V

## SAN Immersion Heaters for water heating etc. Type BL, BV, B

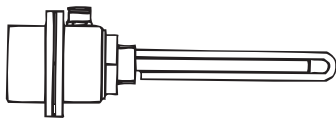


**B 2" WRG**                      **3x230/400V**                      **8W/cm<sup>2</sup>**                      **with thermo well**

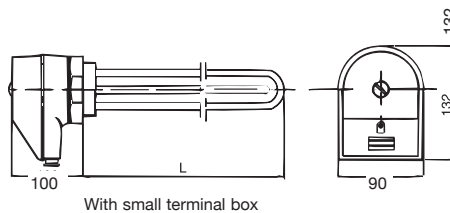
Type	Power kW	Immersion length mm	Part no.
B 20	2.0	275	84208
B 30	3.0	275	84209
B 45	4.5	400	84210
B 60	6.0	500	84211
B 75	7.5	650	84212
B 90	9.0	750	84213
B 120*	12.0	1000	84214
B 150**	15.0	1000	84215

\* only for 3x400V \*\* 10W/cm<sup>2</sup>

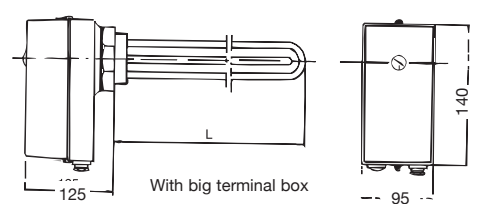
**Type BL**



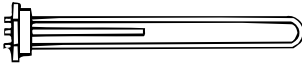
**Type BV**



**Type B**



## Information



**SAN** immersion heaters for heating of fluids consist of 3 parts:

- Immersion heater for screwing in,
- Temperature control (thermostat),
- Terminal box and mounting kits, if any,

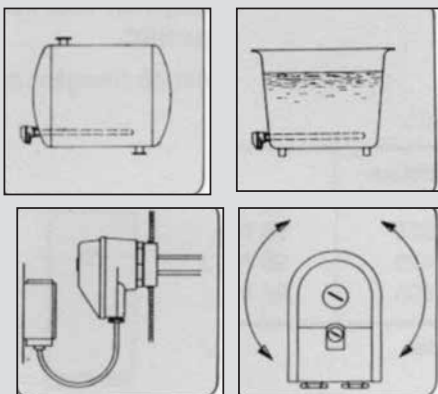
which each has its own part no. Additionally, mounting kit should be ordered, when using a 3-pole thermostat and temperature limiter. See below scheme.

By building together the above parts, it is thus possible exactly to get the immersion heater, which solves the actual assignment best.

**For heating of water, we recommend the following standard types:** BL 1" RG, BV 1<sup>1</sup>/<sub>2</sub>" RG and B 2" RG

**For heating of slightly aggressive fluids:** BRCL 1" RG and BRC 2" RG

**For heating of oil and similar fluids:** BOL 1" RG and BOCX, BODX, BOEX, BOGX all with 2" RG.










**SAN** immersion heater type BL, BV, B, BRCL, BRC and BOL are easy to mount.

Should be mounted horizontally, so that the heating elements are constantly covered by fluid.

The immersion heater is normally screwed into a VVS socket and packed, e.g. with copper/klingerit gasket. By removing the cover of the termination box and loosening the 2 screws in the bottom, it can be turned in relation to the bushing and adjusted to the required position of the PG-couplings. The screws are tightened again, the power cable is let into the terminal box and connected to the terminals. The cover is mounted. If the immersion heater is delivered with a thermostat, this is connected to the circuit of the contactor.

## Terminal Boxes and Controls

Thermostat, terminal box etc. are chosen from the below scheme.

Type	Description	Type	Part no.
1 	Terminal box, small, IP 34, with 2 PG 16 HxWxL = 132x90x80mm. Only thermostat fig. 3 and 4.	1	70556 2" WRG
2 	Terminal box, large, IP 55, with 2 PG 16 HxWxL = 140x95x105mm	2	7055 2" WRG
3 	1-pole thermostat 10-88°C 16 Amp. at 400V	3	31700
4 	1-pole thermostat 30-110°C 16 Amp at 400V	4	31919
5 	3-pole thermostat 5-80°C limiter 99°C with reset 16 Amp at 400V	5	319201
6 	3-pole limiter 110°C 20 Amp at 400V	6	31914
7 	Mounting kit for thermostat fig. 5	7	84100-6

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CVR No.: 42 16 59 13

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## SAN Immersion Heaters for water heating etc. Type BRCL, BRC

### Application:

For heating of slightly aggressive fluids, and where nickled copper heating elements are not applicable, you find the SAN standard programme of immersion heaters in acid proof stainless steel, type BRCL and BRC.

Please note, that no guarantee is provided against corrosion.

Technical data:

Material:

Heating elements, bushing

and thermo well:

Terminal box:

Werkstoff no. 1.4435/AISI 316L

Iron IP 34 for type BRCL

Silumine IP55 for type BRC

### 3 BRCL - 1" RG - 230V - 3.3W/cm<sup>2</sup>

with thermo well

Type	Power kW	Immersion length mm	Part no.
3 BRCL 3	0.34	250	84435
3 BRCL 5	0.5	325	84436
3 BRCL 10	1.0	600	84437
3 BRCL 13	1.34	800	84438
3 BRCL 20	2.0	1000	84439

### 10 BRCL - 1" RG - 230V - 10W/cm<sup>2</sup>

with thermo well

Type	Power kW	Immersion length mm	Part no.
10 BRCL 5	0.5	150	84425
10 BRCL 10	1.0	250	84426
10 BRCL 15	1.5	325	84427
10 BRCL 20	2.0	425	84428
10 BRCL 30	3.0	600	84429

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## SAN Immersion Heaters for water heating etc. Type BRCL, BRC



### 3 BRC - 2" RG - 3x230V/400V - 3.3W/cm<sup>2</sup>

with thermo well

Type	Power kW	Immersion length mm	Part no.
3.BRC 10	1.0	250	84400
3 BRC 15	1.5	325	84401
3 BRC 20	2.0	425	84402
3 BRC 30	3.0	600	84403
3 BRC 40	4.0	800	84404
3 BRC 60	6.0	1000	84405

### 10 BRC - 2" RG - 3x230V/400V - 10W/cm<sup>2</sup>

with thermo well

Type	Power kW	Immersion length mm	Part no.
10 BRC 15*	1.5	150	84410
10 BRC 30	3.0	250	84411
10 BRC 45	4.5	325	84412
10 BRC 60	6.0	425	84413
10 BRC 90	9.0	600	84414
10 BRC 120**	12.0	800	84415
10 BRC 150**	15.0	1000	84416

\*Not all types of control are suitable for this model.

\*\*Only for 3x400V



### Application:

The SAN flow modules are used for building of an electrical heating system, which considers demands on flexibility, power and space utilization.

The modules A, B and C are available in carbon steel or in stainless steel and can have an immersion heater type B, type BRC or type BO mounted, according to the media to be heated. The immersion heaters can be equipped with thermostat and limiter.

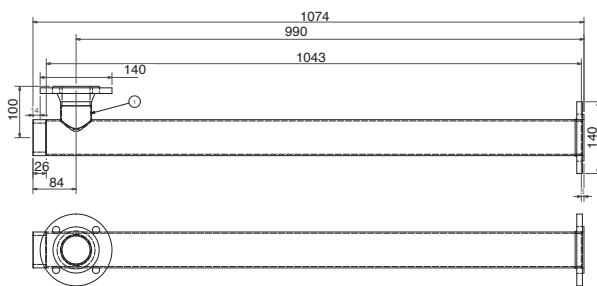
The modules A and B in stainless steel (AISI 316) have flange connections according to DIN 2633 (PN16, DN50).

In normal carbon steel the modules are delivered according to DIN 2631 (PN6, DN50).

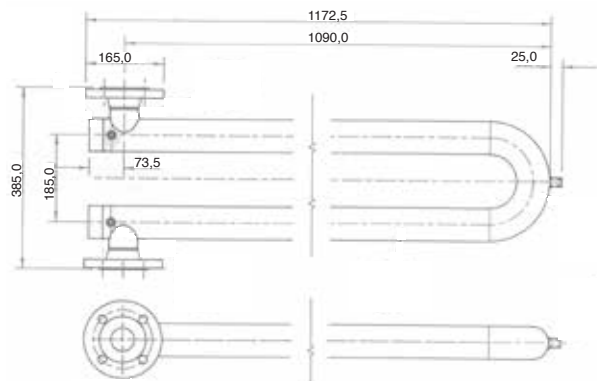
Module C has a 3/4" connection. Insulation can be made.

Type	Part no.
Module A, carbon steel	30134
Module A, acid proof, ss., Werkst. no. 1.4435/AISI 316L	S 125504
Module B, carbon steel	30135
Module B, acid proof, s.s., Werkst. no. 1.4435/AISI 316L	S 124062
Module C, carbon steel	30140
Module C, acid proof, s.s., Werkst. no. 1.4435/AISI 316L	30142
Welding flange for module A and B, steel	41141
Welding flange for module A and B, stainless steel AISI 316	41152
Bolting set with gasket for A and B, steel	30960
Bolting set with gasket for A and B, stainless steel	30965

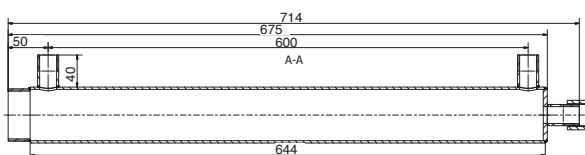
### Module A



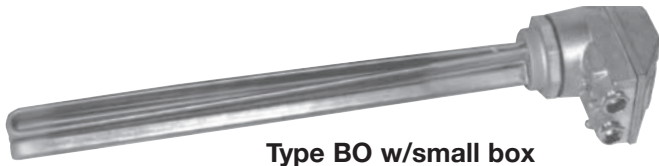
### Module B



### Module C







Type BO w/small box

## SAN Immersion Heaters for oil heating etc. Type BO

**Application:**

All types are equipped with thermo well and can be delivered with thermostat.  
Delivered with terminal box.

**Technical data:****Heating element:**

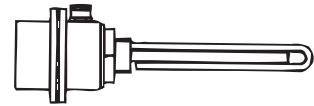
Flat profile B, stainless steel,  
Werkstoff. no. 1.4571, AISI 316Ti

**Bushing:**

Brass

**Terminal box:**

Silumine, IP55, no. 70556, for 2" WRG bushing  
For type BOL: Galvanized box, IP55.



BOL		1"WRG		230V	
Type	Power W	Immersion length mm	W/cm <sup>2</sup>	Part no.	
BOL 20	200	200	1.5	84125	
BOL 25	250	200	2.0	84130	
BOL 55	550	500	1.5	84135	
BOL 75	750	600	2.0	84140	

BOCX 1.0W/cm <sup>2</sup>		2"WRG		3x230/400V	
Type	Power kW	Immersion length mm	Part no.		
BOCX 60	0.60	300	84100		
BOCX 105	1.05	500	84101		
BOCX 180	1.80	800	84107		
BOCX 210	2.10	1000	84108		

BODX 1.5W/cm <sup>2</sup>		2"WRG		3x230/400V	
Type	Power kW	Immersion length mm	Part no.		
BODX 105	1.05	300	84102		
BODX 165	1.65	500	84106		
BODX 210	2.10	625	84110		
BODX 270	2.70	800	84103		
BODX 330	3.30	1000	84115		

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Electro Heat

SAN Immersion Heaters  
for oil heating etc.  
Type BO



## BOEX 2.0W/cm<sup>2</sup>

2"WRG

3x230/400V

Type	Power kW	Immersion length mm	Part no.
BOEX 135	1.35	300	84104
BOEX 225	2.25	500	84111
BOEX 270	2.70	625	84113
BOEX 375	3.75	800	84116
BOEX 480	4.80	1000	84117

## BOGZ 3.0W/cm<sup>2</sup>

2"WRG

3x230/400V

Type	Power kW	Immersion length mm	Part no.
BOGZ 195	1.95	300	84109
BOGZ 270	2.70	400	84112
BOGZ 330	3.30	500	84114
BOGZ 420	4.20	625	84118
BOGZ 540	5.40	800	84119
BOGZ 675	6.75	1000	84120

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CVR No.: 42 16 59 13

# SAN Immersion Heater Type SF

## Application:

SAN immersion heater type SF... for mounting in tanks, vessels or the like, equipped with flange DN65, PN 16 DIN 2527, with replacable heating element, to avoid emptying of the tank or vessel.

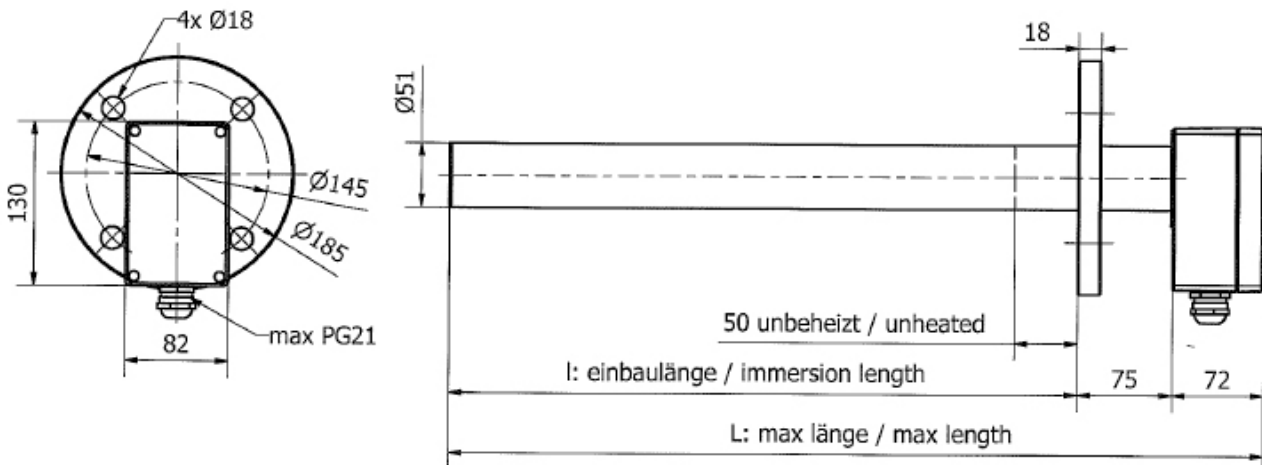
The immersion heater is delivered in steel St. 37 / C22.8 type SFS-... or stainless steel type SFR-..., both types are mounted with silumine box IP 54, which is raised 75mm over the flange.

## Technical data:

SFS-...:	Material, tube St. 37, Ø50mm Flange C22.8, DIN 2527
SFR-...:	Material, tube AISI 316L, 1.4435, Ø50mm
Max. op. press:	10 bar
Cold ends:	50mm
Spec watt load:	1,5 - 2 - 3 - 5W/cm <sup>2</sup>

Other voltages, output, material and dimensions are available upon request.

Type Typ		Immersion depth mm	Wattage at 1.5W/cm <sup>2</sup>		Wattage at 2W/cm <sup>2</sup>		Wattage at 3W/cm <sup>2</sup>		Wattage at 5W/cm <sup>2</sup>		Dia mm
SFS-830	SFR-830	315	625	230V	830	230V	1250	230V	2000	230V	Ø50
SFS-1000	SFR-1000	400	825	230V	1000	230V	1650	230V	2750	3x400V	Ø50
SFS-1070	SFR-1070	500	1060	230V	1400	230V	2100	230V	3530	3x400V	Ø50
SFS-1400	SFR-1400	600	1300	230V	1700	230V	2590	3x400V	4300	3x400V	Ø50
SFS-2350	SFR-2350	800	1765	230V	2350	230V	3530	3x400V	5880	3x400V	Ø50
SFS-2980	SFR-2980	1000	2235	230V	2980	3x400V	4470	3x400V	7450	3x400V	Ø50
SFS-3600	SFR-3600	1200	2700	3x400V	3600	3x400V	5400	3x400V	9000	3x400V	Ø50
SFS-4550	SFR-4550	1500	3400	3x400V	4550	3x400V	6830	3x400V	11000	3x400V	Ø50
SFS-6100	SFR-6100	2000	4550	3x400V	6100	3x400V	9180	3x400V			Ø50



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CVR No.: 42 16 59 13

## SAN Immersion Heaters Type 1, 1.1, 1.2



### Application:

SAN immersion heaters – essentially used for heating and maintenance of oil and lubricating systems f.ex. in gear boxes and hydraulic vessels.

Using our types of immersion heaters provides high advantage, as the element can be replaced rapidly and almost without any use of tools, and also the oil does not need to be drained.




### Option:

All our immersion heaters can be delivered in required: voltage, power and length and with flange or thread.

All the heaters are designed to comply with requirements and specifications for products used on wind turbines.

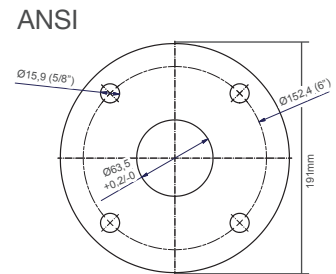
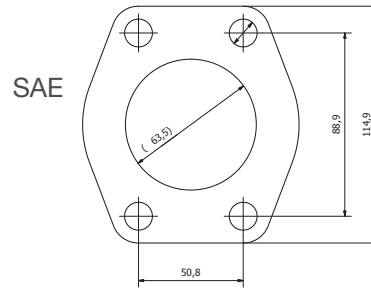
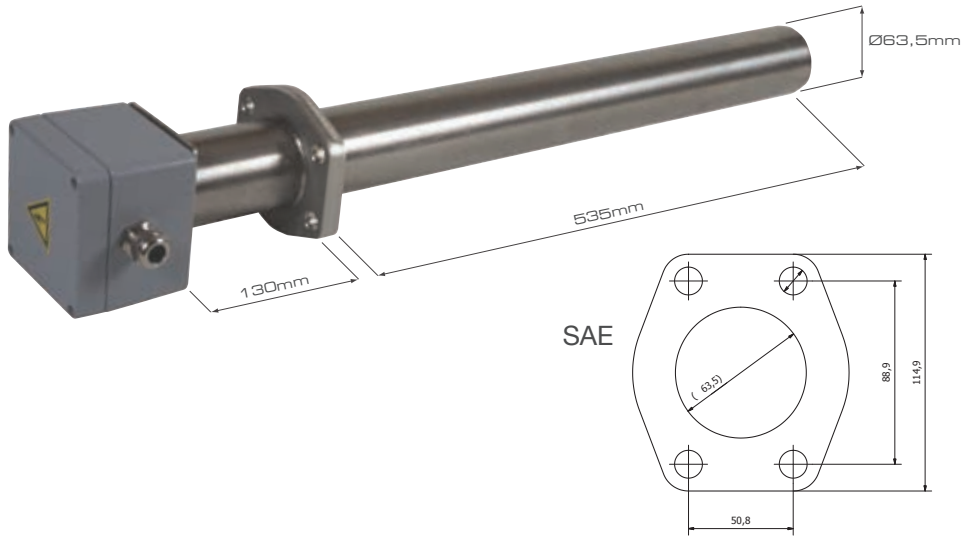
The SAN immersion heaters can be delivered in materials according to request.

### Technical data:




	Type I	Type I.1	Type I.2
Wattage	970W	970W	1000W
Voltage	3x690V	3x480V	230V
Connection	SAE flange	SAE flange	SAE flange
Terminal box	Alu, epoxy painted	Alu, epoxy painted	Alu, epoxy painted
Material	AISI 304	AISI 304	AISI 304
Heating element	Ceramic type, replaceable	Ceramic type, replaceable	Ceramic type, replaceable
Protection class/Enclosure	IP 65 (Nema 12)	IP 65 (Nema 12)	IP 65 (Nema 12)
Pipe dimension	Ø63,5mm	Ø63,5mm	Ø63,5mm
Immersion length	535mm	535mm	535mm
Active length	535mm	535mm	535mm
Inactive length	130mm	130mm	130mm
Mounting position	Horizontal	Horizontal	Horizontal
Surface loading	0.90W/cm <sup>2</sup>	0.90W/cm <sup>2</sup>	0.93W/cm <sup>2</sup>
Approval	File no.  E318987	File no.  E318987	File no.  E318987
Part no.	219108001	221119001	222022001

# SAN Immersion Heater

## Type 1.3, 1.4, 1.5



### Technical data:

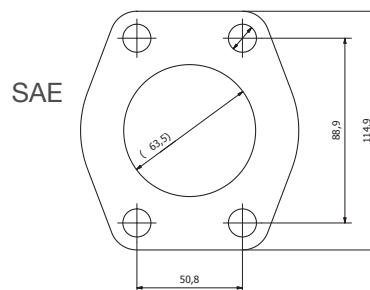
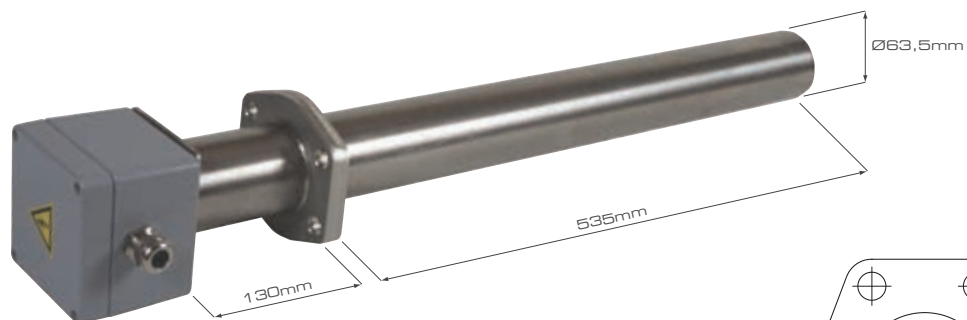
	Type I.3	Type I.4	Type I.5
Wattage	970W	850W	750W
Voltage	400V	3x690V	3x575V
Connection	SAE flange	SAE flange	3" ANSI 150 lbs
Terminal box	Alu, epoxy painted	Alu, epoxy painted	Alu, epoxy painted
Material	AISI 304	AISI 304	AISI 304
Heating element	Ceramic type, replaceable	Ceramic type, replaceable	Ceramic type, replaceable
Protection class/Enclosure	IP 65 (Nema 12)	IP 65 (Nema 12)	IP 65 (Nema 12)
Pipe dimension	Ø63,5mm	Ø63,5mm	Ø63,5mm
Immersion length	535mm	535mm	535mm
Active length	535mm	535mm	535mm
Inactive length	130mm	130mm	130mm
Mounting position	Horizontal	Horizontal	Horizontal
Surface loading	0.90W/cm <sup>2</sup>	0.8W/cm <sup>2</sup>	0.7W/cm <sup>2</sup>
Approval	 File no. E318987	 File no. E318987	 File no. E318987
Part no.	222021001	219108002	225041001

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### SAN Immersion Heaters



#### Technical data:

	Type I.6	Type 1.7	Type 1.8
Wattage	500W	680W	1500W
Voltage	400V	400V	3x400V
Connection	SAE flange	SAE flange	SAE flange
Terminal box	Alu, epoxy painted	Alu, epoxy painted	Alu, epoxy painted
Material	AISI 304	AISI 304	AISI 304
Heating element	Ceramic type, replaceable	Ceramic type, replaceable	Ceramic type, replaceable
Protection class/Enclosure	IP 65 (Nema 12)	IP 65 (Nema 12)	IP 65 (Nema 12)
Pipe dimension	Ø63,5mm	Ø63,5mm	Ø63,5mm
Immersion length	255mm	345mm	950mm
Active length	255mm	345mm	950mm
Inactive length	130mm	130mm	130mm
Mounting position	Horizontal	Horizontal	Horizontal
Surface loading	1.04W/cm <sup>2</sup>	094W/cm <sup>2</sup>	0.78W/cm <sup>2</sup>
Approval	File no.  E318987	File no.  E318987	File no.  E318987
Part no.	228423002	228423003	237934002

## SAN Immersion Heater Type II, II.I, III



### Application:

SAN immersion heaters – essentially used for heating and maintenance of oil and lubricating systems f.ex. in gear boxes and hydraulic vessels.

Using our types of immersion heaters provides high advantage, as the element can be replaced rapidly and almost without any use of tools, and also the oil does not need to be drained.

### Option:

All our immersion heaters can be delivered in required: voltage, power and length and with flange or thread.

All the heaters are designed to comply with requirements and specifications for products used on wind turbines.

The SAN immersion heaters can be delivered in materials according to request.

### Technical data on the models shown:

	Type II	Type II.I	Type III
Wattage	800W	800W	From 200 to 2000W
Voltage	600V	690V	230V upto 690V
Connection	Brass bush 2" WRG x 20mm	Brass bush 2" WRG x 20mm	Carbon steel 2" WRG x 30mm
Terminal box	Silumine	Silumine	Brass nickle plated
Material	AISI 316	AISI 316	Carbon steel
Heating element	Ceramic type, replaceable	Ceramic type, replaceable	Ceramic type or heating element, replaceable
Protection class	IP 55	IP 55	IP 65
Pipe dimension	Ø50mm	Ø50mm	Ø52mm
Immersion length	600mm	600mm	From 300 to 2000mm
Mounting position	Horizontal	Horizontal	Horizontal
Surface loading	0.95W/cm <sup>2</sup>	0.95W/cm <sup>2</sup>	From 0.5 to 3W/cm <sup>2</sup>
Approval	-	-	-
Part no.	N3241800	N3259900	

## SAN Immersion Heaters for water-, oil heating etc. w/replaceable heating element Type SR..



**Application:**

The SAN immersion heater type SR is especially applicable for mounting in vessels, containers and similar constructions, where the ability of replacing the heating element without emptying the plant plays an important role.

Type SR is constructed from acid proof, stainless steel pipe Ø50mm with welded bottom and 2" RG stainless steel bushings with mounted silumine box, IP34 or IP55. The heating element is made from a ceramic type.

Immersion heater type SR must be mounted horizontally.

Adjustment of temperature must be made by a separate thermostat.

**Option: Vertical mounting.**

SR..-1		230V	1W/cm <sup>2</sup>
Type	Power kW	Immersion length mm	Part no.
SR 3-1	0.35	250	84300
SR 7-1	0.70	500	84305
SR 10-1	1.00	750	84308
SR 14-1	1.40	1000	84315
SR 17-1	1.75	1250	84320
SR 21-1	2.10	1500	84325

SR..-3		3x400V	3W/cm <sup>2</sup>
Type	Power kW	Immersion length mm	Part no.
SR 11-3*	1.10	250	84330
SR 22-3*	2.20	500	84335
SR 33-3	3.30	750	84340
SR 44-3	4.40	1000	84345
SR 55-3	5.50	1250	84350
SR 66-3	6.60	1500	84355

SR..-5		3x400V	5W/cm <sup>2</sup>
Type	Power kW	Immersion length mm	Part no.
SR 18-5	1.75	250	84360
SR 35-5	3.50	500	84365
SR 52-5	5.25	750	84370
SR 70-5	7.00	1000	84375
SR 87-5	8.75	1250	84380
SR 105-5	10.50	1500	84385



## Spare Heating Element for immersion heater Type SR..



For the SAN immersion heater type SR we stock the following spare heating elements (round ceramic heating elements diameter 45mm):

### For SR..-1 230V 1W/cm<sup>2</sup>

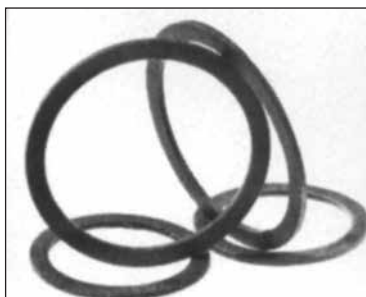
Type	Power kW	Max. L mm	Part no.
f/SR 3-1	0.35	250	84300-31
f/SR 7-1	0.70	500	84300-71
f/SR 10-1	1.00	750	84300-101
f/SR 14-1	1.40	1000	84300-141
f/SR 17-1	1.75	1250	84300-171
f/SR 21-1	2-10	1500	84300-211

### For SR..-3 3x400V 3W/cm<sup>2</sup>

Type	Power kW	Max. L mm	Part no.
f/SR 11-3*	1.10	250	84300-113
f/SR 22-3*	2.20	500	84300-223
f/SR 33-3	3.30	750	84300-333
f/SR 44-3	4.40	1000	84300-443
f/SR 55-3	5.50	1250	84300-553
f/SR 66-3	6.60	1500	84300-663

### For SR..-5 3x400V 5W/cm<sup>2</sup>

Type	Power kW	Max. L mm	Part no.
f/SR 18-5	1.75	250	84300-185
f/SR 35-5	3.50	500	84300-355
f/SR 52-5	5.25	750	84300-525
f/SR 70-5	7.00	1000	84300-705
f/SR 87-5	8.75	1250	84300-875
f/SR 105-5	10.50	1500	84300-1055

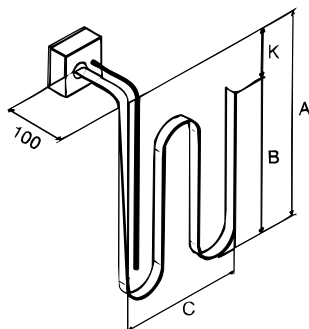


Description	Part no.
1" gasket, CuFi	71211
1½" gasket, CuFi	71213
2" gasket, CuFi	71214
2" gasket, Klingerit	71715
1" Ms-nut	43318
1½" Ms-nut	43316
2" Ms-nut	43315
VVS socket, galv., 2" to 2½"	42190
VVS socket, galv., 2" to 3"	42189
VVS socket, 1"	42172
VVS socket, 1½"	42169
VVS socket, 2"	42170

## Immersion Heating Elements Type KARSAN

The SAN immersion heating elements KARSAN, CHEMISAN and BADSAN are designed for heating of fluids in open vessels and baths.

**KARSAN A and B** are designed from SAN flat tubular heating elements in acid proof, stainless steel (Werkstoff no. 1 4435), type BC, mounted with plastic-terminal box. Additionally, an electronic thermostat with PTC sensor, type Termonic, can be built-into an acid proof, stainless pipe well. Temperature range: -15°C/+40°C, +40°C/+95°C and +95°C/150°C. Protection class: IP 64.



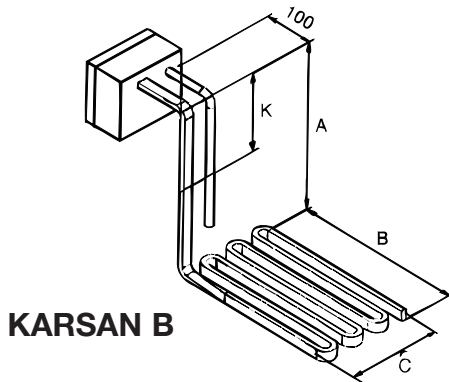
**KARSAN A**

### KARSAN A acid proof, stainless steel

5W/cm<sup>2</sup>

Type	Power W	Voltage V	A mm	B mm	C mm	K mm	Partno.	
A 12-H	1200	230	300	200	130	100	25050	25000
A 21-H	2100	230	300	200	250	100	25051	25001
A 36-F	3600	3x400	350	200	265	150	25052	25002
A 63-F	6300	3x400	450	300	300	150	25053	25003

# Immersion Heating Elements Type KARSAN

**KARSAN B****KARSAN B acid proof, stainless steel****5W/cm<sup>2</sup>**

Type	Power W	Voltage V	A mm	B mm	C mm	K mm	Partno.	
B 12	1200	230	250	200	70	200	25150	25100
B 21	2100	230	250	200	135	200	25151	25101
B 36	3600	3x400	350	300	170	250	25152	25102
B 63	6300	3x400	450	300	300	250	25153	25103

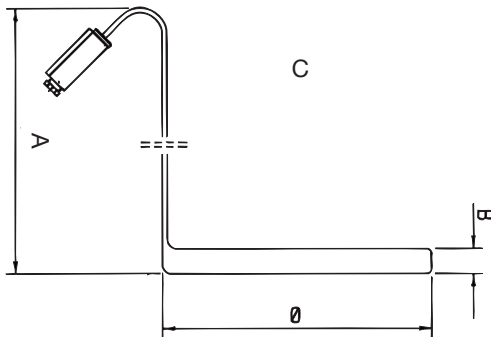
Other power and dimensions manufactured as to specification. No guarantee provided against corrosion of the heating elements.

**KARSAN D and E** are constructed from SAN flat tubular heating elements in acid proof, stainless steel (Werkstoff no. 1.4435), type BC.

The 230 V versions (type D-5, D-10, D-22, E-5, E-10 and E-22) have a casted plast connection, IP 54, and are equipped with 2 m 3-wire conductor PVC cable with earth connection.

The 3x400 V versions (type D-30, D-50, E-30 and E-50) are mounted with PVC connection box IP 55.

KARSAN D and E must be connected to a separate thermostat.

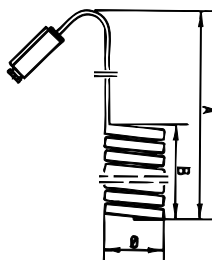
**KARSAN D****KARSAN D acid proof, stainless steel****5W/cm<sup>2</sup>**

Type	Power W	Voltage V	A mm	B mm	C mm Ø	Partno.
D-5	500	230	200	30	100	25025
D-10	1000	230	300	30	125	25026
D-22	2200	230	400	30	150	25027
D-30	3000	3x400	400	50	150	25028
D-50	5000	3x400	500	50	200	25029

**KARSAN E acid proof, stainless steel****5W/cm<sup>2</sup>**

Type	Power W	Voltage V	A mm	B mm	C mm Ø	Partno.
E-5	500	230	200	75	80	25035
E-10	1000	230	300	100	100	25036
E-22	2200	230	400	150	100	25037
E-30	3000	3x400	400	150	100	25033
E-50	5000	3x400	500	150	125	25039

Other power and dimensions are manufactured as to specification. No guarantee provided against corrosion of the heating elements.

**KARSAN E**

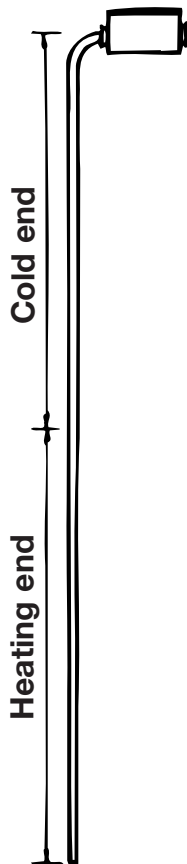
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CVR No.: 42 16 59 13

# Immersion Heating Elements Teflon Type CHEMISAN



**CHEMISAN** is an immersion heating element especially designed for heating of aggressive fluids in open vessels.

The **CHEMISAN** heating element, consisting of a SAN flat tubular heating element manufactured from acid proof, stainless steel (type BC) with PTFE surface, is equipped with a long cold end.

**CHEMISAN** can be bended appropriate for the vessel with heating zone along the bottom and/or along the walls of the vessel.

The **CHEMISAN** heating element is equipped with PVC terminal box (IP 55) and can be delivered with electronic thermostat -15 - 150°C.

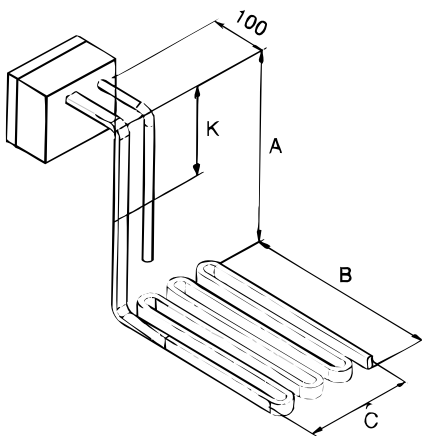
The **CHEMISAN** heating element is equipped with earth connection.

VOLTAGE : 230 V or 3x400 V.  
LOAD : Approx. 900 W/m (2,2 W/cm<sup>2</sup>) max.  
LENGTH : max. 5.5 m incl. cold end  
(cold end according to requirement).  
CROSS SECTION : 8.5 x 18 mm.  
BENDING RADIUS : min. 40 mm.  
BOX : 90 x 35 x 45 mm (without thermostat)

Transition area cold/heating zone is marked on the surface of the heating element. This mark should always be situated at least 50 mm below fluid height.

The heating element must never be connected unless the heating zone is covered by fluid.

## CHEMISAN



The **CHEMISAN** heating element is available in the below standard types and can be delivered with electronic thermostat with PTC-sensor.  
Temperature range: -15°/+40°C, +40°/+95°C and +95°/+150°C.  
Protection class: IP 64.

### CHEMISAN PTFE-coated

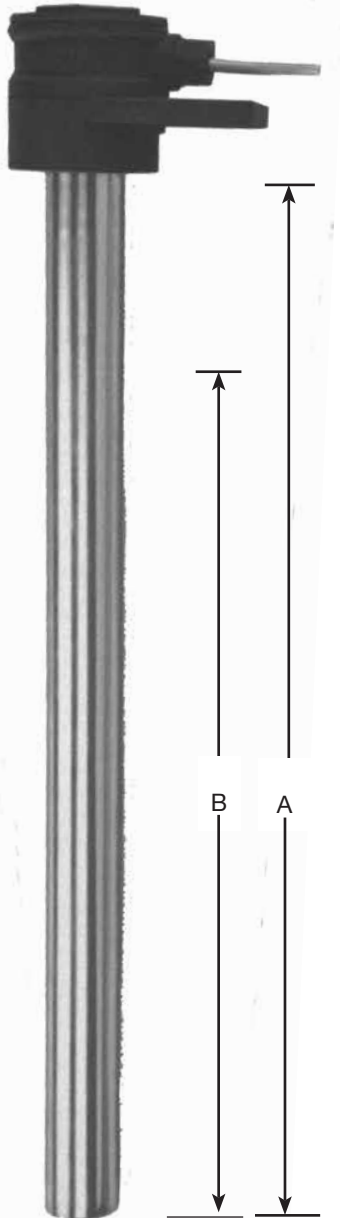
2,2W/cm<sup>2</sup>

Type	Power W	Voltage V	A mm	B mm	C mm	K mm	Partno.	
C-11	1100	230	250	200	250	200	25250	25200
C 20	2000	230	250	200	590	200	25251	25201
C 30	3000	3x400	350	300	480	250	25252	25202
C 38	3800	3x400	450	300	660	250	25253	25203

Other power and dimensions are manufactured as to specification. No guarantee provided against corrosion of the heating elements.

# Immersion Heating Elements

## Type BADSAN



Fluids and solutions, which contain thermal sensitive, organic additives, often demand low surface load ( $W/cm^2$ ).

In this case the **BADSAN** type, which is manufactured from porcelain, acid proof stainless steel or titanium steel immersion tube, mounted with a replaceable ceramic heating element, can advantageously be used.

The top of the immersion tube is equipped with a PP terminal box. Protection class: IP64.

### BADSAN P

### Porcelain \* 54mm Ø

Type	Power W	Voltage V	A mm	B mm	$W/cm^2$	Part no.
P 100	1000	230	400	275	2,7	25500
P 140	1400	230	500	360	2,9	25501
P 200	2000	230	630	460	3,1	25502
P 250	2500	400	800	560	3,1	25503
P 315	3150	400	1000	725	3,0	25504

\*Glazed special porcelain.

Other power, voltage and length up to 2000mm can be delivered.

### BADSAN S

### Acid proof steel \* 45mm Ø

Type	Power W	Voltage V	A mm	B mm	$W/cm^2$	Part no.
S 100	1000	230	400	275	3,3	25520
S 140	1400	230	500	360	3,4	25521
S 200	2000	230	630	460	3,7	25522
S 250	2500	400	800	560	3,7	25523
S 315	3150	400	1000	725	3,6	25524

\*Werkstoff no. 1.4571.

Other power, voltage and length up to 3150mm can be delivered.

## Immersion Heating Elements Type BADSAN

### BADSAN T

### Titanium \* 45mm Ø

Type	Power W	Voltage V	A mm	B mm	W/cm <sup>2</sup>	Part no.
T 100	1000	230	400	275	3,3	25530
T 140	1400	230	500	360	3,4	25531
T 200	2000	230	630	460	3,7	25532
T 250	2500	400	800	560	3,7	25533
T 315	3150	400	1000	725	3,6	25534

\* Werkstoff no. 3.7035.

Other power, voltage and length up to 2000mm can be delivered.

### MINIBAD MP

### Porcelain \* 27mm Ø

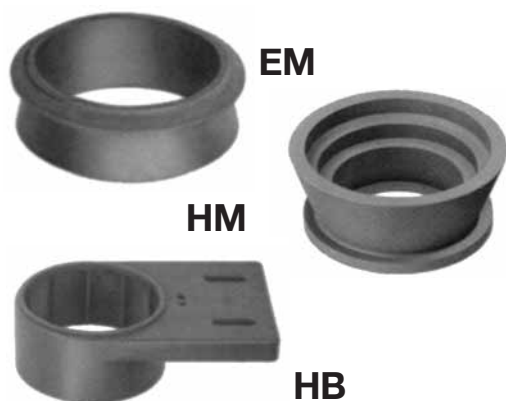
Type	Power W	Voltage V	A mm	B mm	W/cm <sup>2</sup>	Part no.
MP 315	315	230	200	130	3,9	25510

\* Glazed special porcelain.

Other power, voltage and length up to 500mm can be delivered.

Further in acid proof, stainless steel, Titanium and PTFE.

## Accessories for BADSAN



For mounting of the BADSAN immersion heating element on vessels, the below mounting fixture can be used with advantage:

Mounting Fixture	Part no.
Type for EM for hole 87-90mm <sup>Ø</sup> , material EPDM	25550
Type HM for hole 70-76mm <sup>Ø</sup> , material EPDM	25551
Type HB for edge mounting, material PP	25552

# Float Switch Type AT 920



The float switch AT 920 with small dimensions: 78 mmø x 58 mm can with advantage be used as protection for the SAN immersion heating elements mounted in open vessels.

It has been constructed from polypropylene with a built-in ball switch and equipped with 5 m cable.

Type MR is casted in Hypalone for use in aggressive fluids:

Dimension: 92 mmø x 180 mm.

Connecting and breaking current: 20/8 Amp.

Max. outside pressure: 1 bar.

## Float Switch AT 920

230V

Type	Cable	Max. temp.	FI-function	Part no.
MR HY 77	Hypalone, 3 wire	95	Conn.-break	33500
AT 920 VR 70	PVC 3-wire cond.	70	Switch	33504
AT 920 VR 85	Neoprene 3-wire	85	Switch	33505
Balasting weight: 200 gr. Can be locked to the cable				33510

## POWER CALCULATION

For calculating the required power for heating of a fluid, the mentioned formula should be used. Heat loss and possible voltage variations are not considered. These normally require an addition of 5-20%.

- P = the required power in kW.  
 m = fluid amount in l/h (or dm<sup>3</sup>/h)  
 r = special gravity of fluid in kg/dm<sup>3</sup>  
 C<sub>p</sub> = specific heat of fluid in kJ/kgK  
 t<sub>2</sub>-t<sub>1</sub> = final temperature - starting temperature.  
 h = required heating period in hours

For water the following formula is valid: r = 1 og C<sub>p</sub> = 4.18

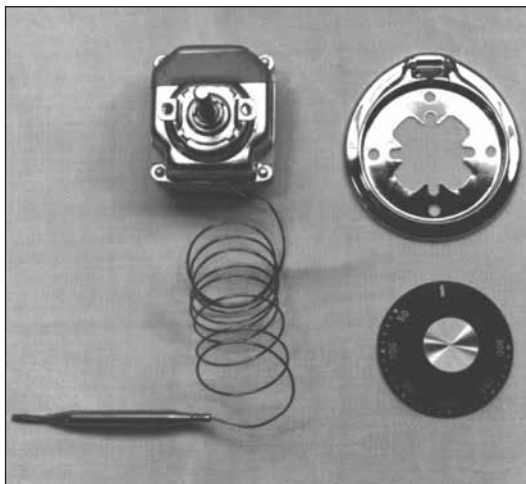
$$P = \frac{m \cdot r \cdot C_p \cdot (t_2 - t_1)}{3600 \cdot h}$$

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CVR No.: 42 16 59 13



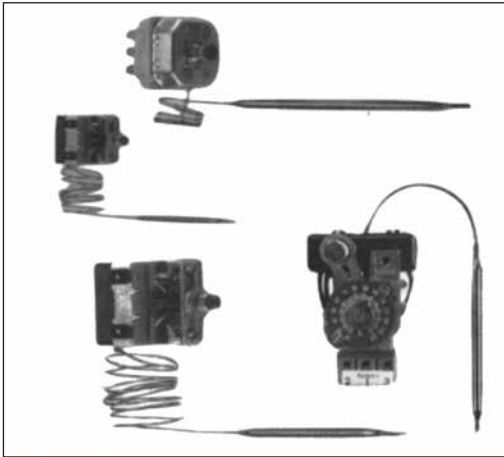
**Type EGO**  
**For building in**

**16A - 400V**

Temp. range	Capillary length	Sensor mm	Pole qty.	Part no.
50°C-300°C	830mm	3,1 <sup>0</sup> x160	1*	31899
30°C-110°C	850mm	6 <sup>0</sup> x115	1	31900
50°C-300°C	870mm	6 <sup>0</sup> x75	3	31901
30°C-110°C	4930mm	6 <sup>0</sup> x115	1	31902
50°C-300°C	830mm	3,1 <sup>0</sup> x160	1	31903
50°C-300°C	2000mm	6 <sup>0</sup> x80	3	319011
0°C-40°C	850mm	6 <sup>0</sup> x147	1*	31923
0°C-145°C	1480mm	6 <sup>0</sup> x98	3	31500
25°C-90°C	800mm	6 <sup>0</sup> x92	1	31875
* with switch				
Chromed front ring				31898
Chromed front ring for 31875				31878
Black setting button 0-40°C				31895
Black setting button 1-145°C				31520
Black setting button 30-110°C				31896
Black setting button 50-300°C				31897
Black setting button 30-110°C				31896



# Temperature Limiter Type EGO



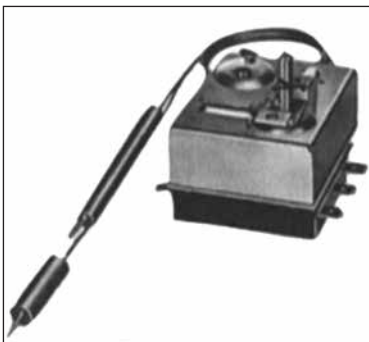
These temperature limiters are especially designed for building-into machines, vessels, heating units etc. for protection against over-heating. Manually reset.

## Type EGO For building in

16A - 400V

Switch off temperature	Capillary length	Sensor mm	Pole qty.	Part no.
140°C	1150mm	3,1 <sup>0</sup> x156	1	31912
140°C	890mm	3,1 <sup>0</sup> x188	3	31913
110°C	890mm	6 <sup>0</sup> x94	3	31914
110°C	890mm	6 <sup>0</sup> x73	1	319141
190°C	890mm	6 <sup>0</sup> x77	3	31932
170°C	830mm	6 <sup>0</sup> x73	1	31933
270°C	830mm	3,1 <sup>0</sup> x160	1	91944
1000°C	830mm	6 <sup>0</sup> x129	1	31880
36°C-110°C	830mm	6 <sup>0</sup> x170	1	31881
20°C-150°C	2000mm	7 <sup>0</sup> x128	1*	319121
* with change-over switch				

## Thermostat w/ Temperature Limiter



The EGO thermostat is equipped with 2 capillary tubes, one for the temperature range and one for the limiter temperature. Both are lead into the same thermo well. When the limiter temperature has been reached, the thermostat must be manually reset.

## Type EGO

3x16A - 400V

Temperature range	Limiting temperature	Sensor I/II	Setting	Part no.
5°-80°C	99°C	6 <sup>0</sup> x181	slot	319201
30°C-85°C	110°C	8,5 <sup>0</sup> x221	shaft	319221
30°C-85°C	button for 319221 318955			

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# SAN<sup>®</sup>

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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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