

) Contents)

J
a
n
u
a
r
y
2
0
0
6

Technical data

General points - Description - Checking & connections

4

Material specification

Types of heating cable - cable, frame, strips

5

Chemical compatibility

Choosing the cable - choosing the assembly materials

6

Flat heaters

Assembly types A & B

Assembly types C & D

Assembly type F

References single-phase heaters

References three-phases heaters

Codification

Special manufacture

7

Cylindrical heaters

Assembly types R - S - P

References

Control-Therm T

Control-Therm U

Codification

15

Annular heaters

"T" range

References

Codification

21

Regulation

Probes

Codification

Control boxes

25

Other informations

Safety measures

Installation power enquiry form

29

) Technical data)

General points

Our immersion heaters are manufactured to heat only liquids. They are specially designed with a cable that only heats the part that is to be continually immersed. The cable is covered with a Teflon® coating. This plastic sheath enables the heaters to resist the flow of heat and the chemical attack of the bath. Our company is set up according to the requirements of the ISO 9001 : 2000 norm and is certified by L.R.Q.A under the following number : 9910714.

Description

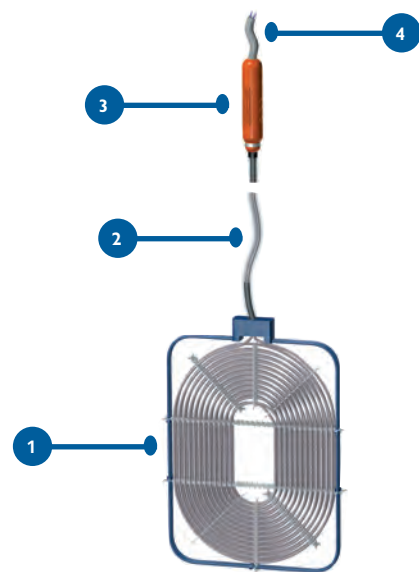
The heating part comes in the form of a flat or cylindrical unit.

It is followed by a non-heating-support-stem (called N) which must be covered by at least 20 cms of liquid. The two black marks on the N part indicate the minimum and the maximum level of solution.

The connection must be installed out of the tank and out of vapours.

The N part can be flexible or rigid and lengthened. It is protected by an expandable PP braided sleeving. After the N part there is a tube called «connection» in which we link our cable to a standard electric cable of type HO5 VV-F or HO7 RN-F according voltage and power (C part).

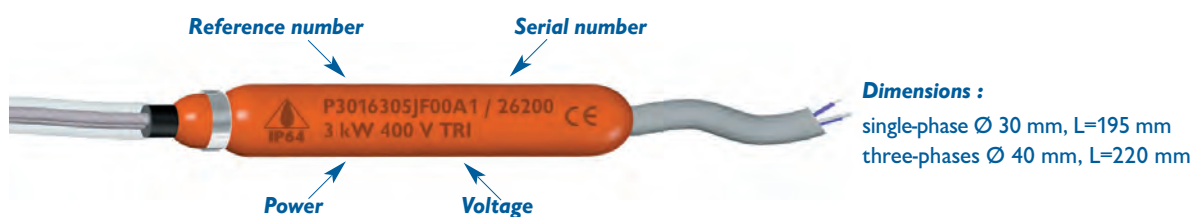
Our cable is screened throughout the entire length by a copper earthing strip which must be connected to the earth via the electrical «C» cable.



- 1 heating part, to be kept immersed
- 2 non heating part N, standard length 1 m
- 3 connection, IP64
- 4 electrical cable C, standard length 1 m

Checking and Connection

All necessary information regarding the heater is engraved on its moisture proof connection : reference number, serial number, power and voltage. The connection is IP64* and is injected with PVC. Each heater is tested before it leaves the factory : insulation resistance is checked with a 5000 volts high-voltage destructive test for a period of one minute and verification of the heat resistance value.

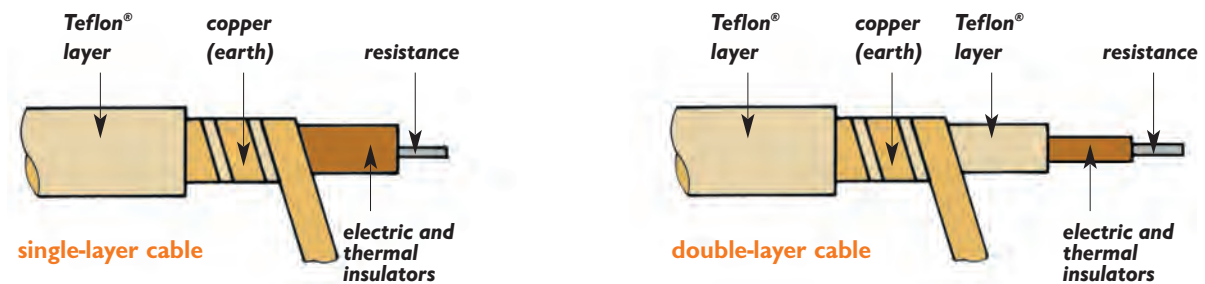


* totally protected against dust and protected against water discharge

Material specification

Types of heating cable

The outer insulation of our cable is obtained by a co-extrusion of Teflon® FEP or Teflon® PFA. The choice of the sheath (FEP or PFA, single-layer or double-layer) is made according to both the liquid heated and the operating temperature.



Materials used

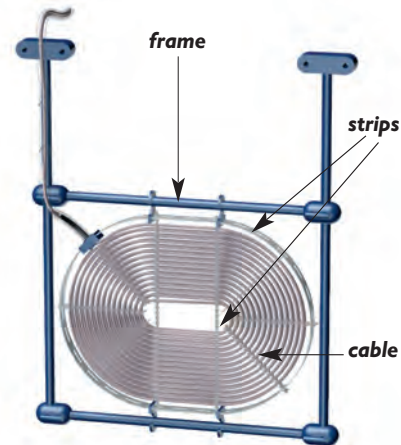
Teflon® (FEP & PFA) : resistance to chemicals almost universal and up to high temperatures.

Polyvinylidene Fluoride (PVDF) : preferably for acid or slightly alkaline solutions (see page 6).

Polypropylene (PP) : used for alkaline solutions but not recommended for high temperatures

Stainless steel (304L) : used to replace PP in alkaline solutions at high temperatures

Polyvinyl chloride (PVC) : to coat the electric connection and the electrical cable (HO5 VV-F)



Cable

The heating zone is formed by the winding of the heating part of the cable. This is the active part of the heater. In order to respond to most requirements, several types of cables are proposed.

STANDARD 1 W/cm² cable
Teflon® FEP single layer

SPECIAL 1 W/cm² cables
Teflon® PFA single layer
Teflon® FEP double layer
Teflon® PFA double layer

HD low charge 0,5W/cm² cables
PFA single layer 0,5 W/cm²
PFA double layer 0,5 W/cm²

Frame

The frame is optional : see following pages for the different types of assembly available. The frame secures the heating part. It is made in PP, PVDF or stainless steel according the specification of the solution heated. A rod frame (PP or PVDF) is recommended for 6 kW heaters and higher.

Strips

The strips (ie. the reeds and the perforated strips) allow the cable to hold itself within the different shapes and dimensions. The strips form the spinal column of the heater. The reeds and the perforated strips are made in PP, PVDF or Teflon® according the specification of the solution heated.



The choice of the material is essential to ensure longevity of the heater.

) Chemical compatibility)

Choosing the type of cable

Tank contents

The type of Teflon® to choose depends on the tank contents.

The FEP cable is suitable in most cases. For some applications and mainly baths containing nitric acid a double layer cable is advised.

Temperature

The 1 W/cm² cable is convenient up to 90°C.

From 90° and up to 120°C, we advise a low load cable (0,5 W/cm²).

Surface Temperature

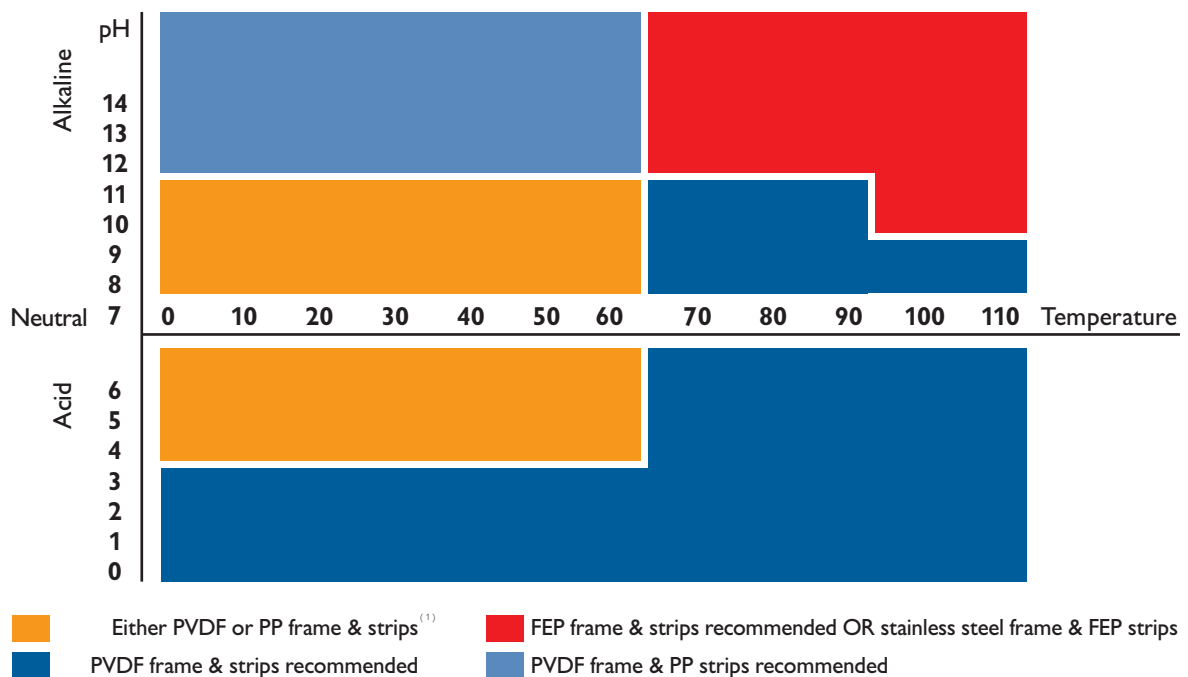
The thermal exchange coefficient of 1 W/cm² ensures the surface temperature differs very little from the temperature of the liquid heated.

Choosing the assembly materials

The choice of the materials used for the frame and the strips depends on the solution and its operating temperature. The chart below is designed to show which plastic to use depending on the temperature, for most common chemical solutions.

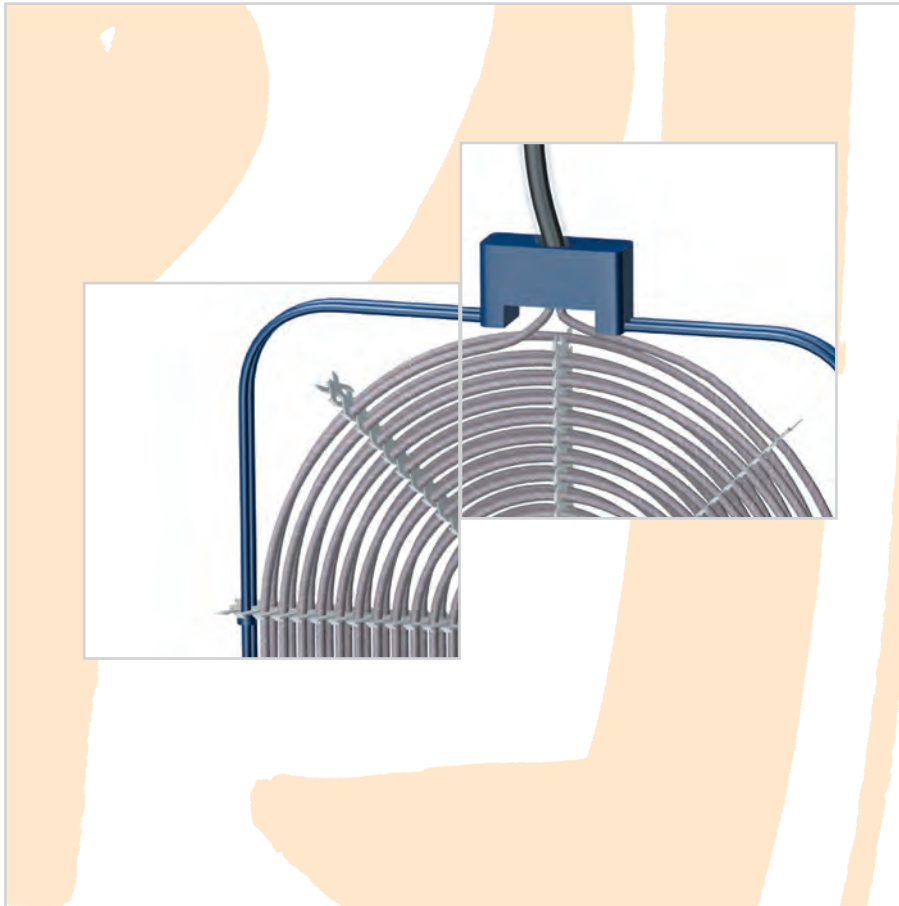
With regard to baths containing mixtures of chemicals, the supplier usually advises on the suitable plastics for tank material.

However, please note we keep an updated data base of the baths in which our heaters are used. Our sales and marketing team is at your disposal to advise you on the best choice.



⁽¹⁾ the PVDF being more rigid it is advised for 6 kW heaters and higher

) Flat heaters)



Assembly types

A & B

STAINLESS STEEL
frame insulated
PP or PVDF

[p. 8](#)

Assembly types

C & D

PLASTIC STRIP
frame in
PP or PVDF

[p. 9](#)

Assembly type F

PLASTIC ROD
frame in
PP or PVDF

[p. 10](#)

Flat heaters Assembly A & B

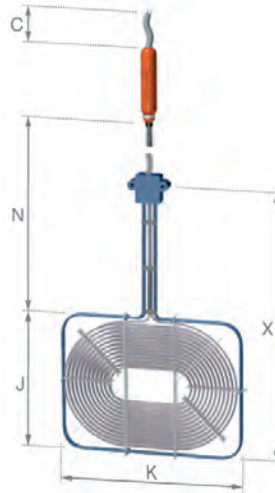
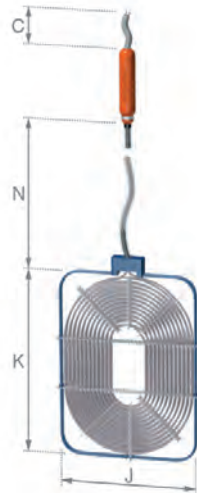
Models adapted to all classical tank configurations and offering a large exchange surface in a minimum bulk.

Assembly type A

on metallic frame
coated with PP or PVDF

A type for installation
on the side or at the
bottom of the tank

for heaters with reference
numbers P30, P40, P90



Assembly type B

on metallic frame
coated with PP or PVDF

B type with fixing
bracket for installation
on the side

for heaters with reference
numbers P30, P40, P90

The choice of N position is available on the full range
on either the J (small side) or K (large side)

When ordering, state :

the reference number given by the table of dimensions p.11 (1-ph) and p.12 (3-ph)

the assembly type (A,B...)

the frame & the support strips materials (standard : PVDF or PP, FEP optional)

the N (non heating part) & the C (electric cable) lengths tolerance of ± 50 mm

for type B : the X dimension (height up to the support)

the heater positioning : small side J horizontal or large side K horizontal

Options & Accessories

(any other assembly type possible on request)

Extra length of cables



electrical cable C
of type HO5 VV-F
or HO7 RN-F
non heating cable N
to go out of the tank

Removable guards



perforated plastic guard in
PP or PVDF
ref in PP : PRPPP
ref in PVDF : PRPPF

Feet



for installation at the bottom of
the tank, feet in PP or PVDF
(standard height 50 mm)
ref in PP : PIPP
ref in PVDF : PIPF

Cable-gland, $\varnothing 75$ mm



allow between 200 to 300
mm extra on the H length
(H=installation height on N)
ref in PP : PEPP
ref in PVDF : PEPPF

Flat heaters Assembly C & D

These models are particularly adapted to small tank configurations and low powers

Assembly type C

PP or PVDF
strip frame

C type for installation on the side or at the bottom of the tank

for heaters with reference numbers P30, P40, P90



Assembly type D

PP or PVDF
strip frame

D type for installation at the bottom of the tank

for heaters with reference numbers P30, P40, P90

The choice of N position is available on the full range on either the J (small side) or K (large side)

When ordering, state :

the reference number given by the table of dimensions p.11 (1-ph) and p.12 (3-ph)

the assembly type (C,D...)

the frame & the support strips materials (standard : PVDF or PP, FEP optional)

the N (non heating part) & the C (electric cable) lengths tolerance of ± 50 mm

the heater positioning : small side J horizontal or large side K horizontal

Options & Accessories

(any other assembly type possible on request)

Extra length of cables



electrical cable C
of type HO5 VV-F
or HO7 RN-F
non heating cable N
to go out of the tank

Guards



a perforated plastic guard for P40 and P90, in PP or PVDF
ref in PP : PRPPP
ref in PVDF : PRPPF

Feet



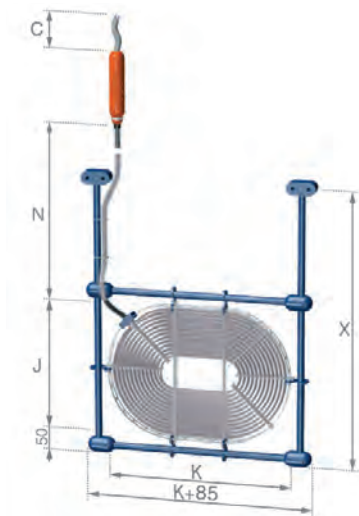
for P30, P40 and P90 assembly type D in PP or PVDF (standard height 50 mm)
ref in PP : PIPP
ref in PVDF : PIPF

Cable-gland, Ø75 mm



allow between 200 to 300 mm extra on the H length (H=installation height on N)
ref in PP : PEPP
ref in PVDF : PEPPF

Flat heaters Assembly F



for heaters with reference numbers P30, P40, P90

Universal model for all types of installation such as side of tank, bottom of tank with feet or on slidings. Rigid structure ideal for important powers.

Assembly type F

on a plastic rod frame \varnothing 20 mm
frame in PP or PVDF

This modular assembly type provides a satisfactory installation of the heaters in all situations. The heater is secured on the rod structure by clips which, whenever needed, make the removal of the heating part easier. Please note the reference table of the flat heaters on the next page does not give the overall dimensions of the F range assembly type : 85 mm \pm 10 mm must be added to each length and width as shown on this picture.

The choice of N position is available on the full range on either the J (small side) or K (large side)

When ordering, state :

- the reference number given by the table of dimensions p.11 (1-ph) and p.12 (3-ph)
- the frame & the support strips materials (standard : PVDF or PP)
- the N (non heating part) & the C (electric cable) lengths tolerance of \pm 50 mm
- the X dimension (height up to the support)
- the heater positioning : small side J horizontal or large side K horizontal

Options & Accessories

(any other assembly type possible on request)

Extra length of cables



electrical cable C
of type HO5 VV-F
or HO7 RN-F
non heating cable N
to go out of the tank

Feet



in PP or PVDF for installation at the bottom of the tank (standard height 100 mm)
ref in PP : PIPP
ref in PVDF : PIPF

Frame supports



frame supports in PP or PVDF to fix on the edge of the tank
ref in PP : SUPP
ref in PVDF : SUPF

Removable guards



perforated plastic guard in PP or PVDF
ref in PP : PRPPP
ref in PVDF : PRPPF

Cable-gland \varnothing 75 mm



allow between 200 to 300 mm extra on the H length (H=installation height on N)
ref in PP : PEPP
ref in PVDF : PEPF

Wedges



wedges for PP or PVDF frame to fix on the edge of the tank
ref in PP : CAPP
ref in PVDF : CAPF

Flat heaters Reference table

References beginning by : P30 = thickness 30 mm / P40 = 40 mm / P90 B = 90 mm / P90 C=100 mm

Standard cable : FEP single layer. Other cable available, see page 5.

Please ask for advise. For the construction of the reference, see page 13.

All dimensions given with a tolerance of ± 10 mm .

S I N G L E - P H A S E H E A T E R S					
KW	J x K	230V sg-ph	KW	J x K	230V sg-ph
0.5 kW	150 x 375	P30 03 05 2	4 kW	225 x 880	P30 07 40 2
	170 x 265	P30 04 05 2		260 x 700	P30 09 40 2
	185 x 210	P30 05 05 2		315 x 545	P30 12 40 2
	165 x 230	P40 03 05 2		330 x 515	P30 13 40 2
1 kW	150 x 605	P30 03 10 2		350 x 475	P30 14 40 2
	170 x 520	P30 04 10 2		385 x 435	P30 16 40 2
	185 x 365	P30 05 10 2		405 x 420	P30 17 40 2
	205 x 335	P30 06 10 2		205 x 810	P40 05 40 2
	220 x 290	P30 07 10 2		225 x 685	P40 06 40 2
	240 x 250	P30 08 10 2		245 x 595	P40 07 40 2
	165 x 395	P40 03 10 2		285 x 475	P40 09 40 2
	185 x 305	P40 04 10 2		310 x 435	P40 10 40 2
	205 x 255	P40 05 10 2	325 x 400	P40 11 40 2	
225 x 230	P40 06 10 2	345 x 375	P40 12 40 2		
1.5 kW	165 x 680	P30 04 15 2	5 kW	340 x 580	P30 13 50 2
	205 x 425	P30 06 15 2		360 x 545	P30 14 50 2
	220 x 355	P30 07 15 2		375 x 520	P30 15 50 2
	240 x 315	P30 08 15 2		395 x 500	P30 16 50 2
	260 x 285	P30 10 15 2		410 x 475	P30 17 50 2
	185 x 375	P40 04 15 2		430 x 455	P30 18 50 2
	205 x 345	P40 05 15 2		450 x 445	P30 19 50 2
	225 x 275	P40 06 15 2		215 x 940	P40 05 50 2
	245 x 245	P40 07 15 2		235 x 790	P40 06 50 2
	245 x 245	P40 08 15 2		255 x 685	P40 07 50 2
2 kW	170 x 765	P30 04 20 2		275 x 605	P40 08 50 2
	185 x 635	P30 05 20 2		295 x 545	P40 09 50 2
	205 x 565	P30 06 20 2		315 x 495	P40 10 50 2
	220 x 475	P30 07 20 2		335 x 460	P40 11 50 2
	240 x 420	P30 08 20 2		355 x 430	P40 12 50 2
	260 x 380	P30 09 20 2		375 x 405	P40 13 50 2
	275 x 340	P30 10 20 2		395 x 390	P40 14 50 2
	295 x 315	P30 11 20 2		6 kW	275 x 990
	185 x 515	P40 04 20 2	295 x 855		P30 11 60 2
	210 x 420	P40 05 20 2	310 x 825		P30 12 60 2
225 x 350	P40 06 20 2	350 x 720	P30 14 60 2		
245 x 305	P40 07 20 2	365 x 645	P30 15 60 2		
265 x 275	P40 08 20 2	385 x 635	P30 16 60 2		
3 kW	205 x 925	P30 06 30 2	405 x 625		P30 17 60 2
	225 x 790	P30 07 30 2	420 x 570		P30 18 60 2
	240 x 690	P30 08 30 2	440 x 550		P30 19 60 2
	260 x 620	P30 09 30 2	455 x 545		P30 20 60 2
	275 x 555	P30 10 30 2	475 x 540		P30 21 60 2
	295 x 510	P30 11 30 2	265 x 785		P40 08 60 2
	315 x 460	P30 12 30 2	305 x 635	P40 10 60 2	
	330 x 440	P30 13 30 2	325 x 585	P40 11 60 2	
	345 x 410	P30 14 30 2	350 x 550	P40 12 60 2	
	365 x 390	P30 15 30 2	365 x 505	P40 13 60 2	
	370 x 385	P30 16 30 2	390 x 470	P40 14 60 2	
	205 x 685	P40 05 30 2	405 x 455	P40 15 60 2	
	225 x 575	P40 06 30 2	425 x 425	P40 16 60 2	
	245 x 500	P40 07 30 2	300 x 300	P90 10 60 2	
	265 x 445	P40 08 30 2			
285 x 400	P40 09 30 2				
325 x 340	P40 11 30 2				
340 x 340	P40 12 30 2				

List of other voltages available :

- 110V single-phase : 0.5 kW, 1 kW, 1.5 kW, 2 kW
- 460V single-phase : 1 kW, 1.5 kW, 2 kW, 3 kW, 4 kW, 5 kW, 6 kW

Flat heaters Reference table

T H R E E - P H A S E S H E A T E R S							
KW	J x K	230V 3-ph	400V 3-ph	KW	J x K	230V 3-ph	400V 3-ph
1.5 kW	170 x 680	P30 04 15 4	P30 04 15 5	9 kW	400 x 975	P30 17 90 4	P30 17 90 5
	205 x 475	P30 06 15 4	P30 06 15 5		435 x 870	P30 19 90 4	P30 19 90 5
	225 x 440	P30 07 15 4	P30 07 15 5		475 x 800	P30 21 90 4	P30 21 90 5
	240 x 360	P30 08 15 4	P30 08 15 5		490 x 790	P30 22 90 4	P30 22 90 5
	280 x 340	P30 10 15 4	P30 10 15 5		525 x 720	P30 24 90 4	P30 24 90 5
	185 x 380	P40 04 15 4	P40 04 15 5		545 x 705	P30 25 90 4	P30 25 90 5
	205 x 375	P40 05 15 4	P40 05 15 5		565 x 695	P30 26 90 4	P30 26 90 5
	225 x 325	P40 06 15 4	P40 06 15 5		600 x 675	P30 28 90 4	P30 28 90 5
	245 x 275	P40 07 15 4	P40 07 15 5		345 x 890	P40 12 90 4	P40 12 90 5
	270 x 270	P40 08 15 4	P40 08 15 5		385 x 775	P40 14 90 4	P40 14 90 5
	195 x 195	P90 05 15 4	P90 05 15 5		405 x 730	P40 15 90 4	P40 15 90 5
					425 x 685	P40 16 90 4	P40 16 90 5
					445 x 655	P40 17 90 4	P40 17 90 5
			465 x 625	P40 18 90 4	P40 18 90 5		
			505 x 575	P40 20 90 4	P40 20 90 5		
			525 x 565	P40 21 90 4	P40 21 90 5		
			375 x 375	P90 15 90 4	P90 15 90 5		
3 kW	205 x 905	P30 06 30 4	P30 06 30 5	12 kW	430 x 1075	P30 18 12 4	P30 18 12 5
	225 x 910	P30 07 30 4	P30 07 30 5		440 x 1070	P30 19 12 4	P30 19 12 5
	240 x 700	P30 08 30 4	P30 08 30 5		510 x 885	P30 23 12 4	P30 23 12 5
	260 x 705	P30 09 30 4	P30 09 30 5		585 x 785	P30 27 12 4	P30 27 12 5
	275 x 580	P30 10 30 4	P30 10 30 5		385 x 915	P40 14 12 4	P40 14 12 5
	295 x 575	P30 11 30 4	P30 11 30 5		405 x 860	P40 15 12 4	P40 15 12 5
	315 x 490	P30 12 30 4	P30 12 30 5		425 x 800	P40 16 12 4	P40 16 12 5
	330 x 465	P30 13 30 4	P30 13 30 5		465 x 740	P40 18 12 4	P40 18 12 5
	350 x 450	P30 14 30 4	P30 14 30 5		485 x 705	P40 19 12 4	P40 19 12 5
	370 x 410	P30 15 30 4	P30 15 30 5		505 x 680	P40 20 12 4	P40 20 12 5
	380 x 395	P30 16 30 4	P30 16 30 5		545 x 625	P40 22 12 4	P40 22 12 5
	205 x 735	P40 05 30 4	P40 05 30 5		585 x 595	P40 24 12 4	P40 24 12 5
	230 x 615	P40 06 30 4	P40 06 30 5		410 x 410	P90 16 12 4	P90 16 12 5
	250 x 545	P40 07 30 4	P40 07 30 5				
	265 x 470	P40 08 30 4	P40 08 30 5				
	285 x 420	P40 09 30 4	P40 09 30 5				
	325 x 360	P40 11 30 4	P40 11 30 5				
	340 x 340	P40 12 30 4	P40 12 30 5				
	250 x 250	P90 07 30 4	P90 07 30 5				
4.5 kW	240 x 905	P30 08 45 4	P30 08 45 5	15 kW	430 x 1245	P30 18 13 4	P30 18 13 5
	275 x 750	P30 10 45 4	P30 10 45 5		445 x 1235	P30 19 13 4	P30 19 13 5
	295 x 730	P30 11 45 4	P30 11 45 5		465 x 1140	P30 20 13 4	P30 20 13 5
	315 x 625	P30 12 45 4	P30 12 45 5		485 x 1125	P30 21 13 4	P30 21 13 5
	350 x 535	P30 14 45 4	P30 14 45 5		500 x 1045	P30 22 13 4	P30 22 13 5
	370 x 520	P30 15 45 4	P30 15 45 5		520 x 1030	P30 23 13 4	P30 23 13 5
	385 x 505	P30 16 45 4	P30 16 45 5		540 x 1035	P30 24 13 4	P30 24 13 5
	405 x 460	P30 17 45 4	P30 17 45 5		555 x 950	P30 25 13 4	P30 25 13 5
	420 x 440	P30 18 45 4	P30 18 45 5		575 x 940	P30 26 13 4	P30 26 13 5
	265 x 595	P40 08 45 4	P40 08 45 5		595 x 925	P30 27 13 4	P30 27 13 5
	285 x 535	P40 09 45 4	P40 09 45 5		375 x 1125	P40 13 13 4	P40 13 13 5
	305 x 480	P40 10 45 4	P40 10 45 5		395 x 1055	P40 14 13 4	P40 14 13 5
	325 x 445	P40 11 45 4	P40 11 45 5		415 x 1000	P40 15 13 4	P40 15 13 5
	345 x 425	P40 12 45 4	P40 12 45 5		435 x 940	P40 16 13 4	P40 16 13 5
	365 x 395	P40 13 45 4	P40 13 45 5		455 x 890	P40 17 13 4	P40 17 13 5
	380 x 380	P40 14 45 4	P40 14 45 5		475 x 850	P40 18 13 4	P40 18 13 5
	265 x 265	P90 09 45 4	P90 09 45 5		495 x 810	P40 19 13 4	P40 19 13 5
			515 x 780	P40 20 13 4	P40 20 13 5		
			535 x 750	P40 21 13 4	P40 21 13 5		
			555 x 725	P40 22 13 4	P40 22 13 5		
			575 x 700	P40 23 13 4	P40 23 13 5		
			595 x 690	P40 24 13 4	P40 24 13 5		
			615 x 660	P40 25 13 4	P40 25 13 5		
			635 x 640	P40 26 13 4	P40 26 13 5		
			450 x 450	P90 17 13 4	P90 17 13 5		
6 kW	275 x 990	P30 10 60 4	P30 10 60 5	n e w			
	295 x 855	P30 11 60 4	P30 11 60 5				
	310 x 825	P30 12 60 4	P30 12 60 5				
	350 x 720	P30 14 60 4	P30 14 60 5				
	365 x 645	P30 15 60 4	P30 15 60 5				
	385 x 635	P30 16 60 4	P30 16 60 5				
	405 x 625	P30 17 60 4	P30 17 60 5				
	420 x 570	P30 18 60 4	P30 18 60 5				
	440 x 550	P30 19 60 4	P30 19 60 5				
	455 x 545	P30 20 60 4	P30 20 60 5				
	475 x 540	P30 21 60 4	P30 21 60 5				
	265 x 785	P40 08 60 4	P40 08 60 5				
	305 x 635	P40 10 60 4	P40 10 60 5				
	325 x 585	P40 11 60 4	P40 11 60 5				
	350 x 550	P40 12 60 4	P40 12 60 5				
	365 x 505	P40 13 60 4	P40 13 60 5				
	390 x 470	P40 14 60 4	P40 14 60 5				
405 x 455	P40 15 60 4	P40 15 60 5					
425 x 425	P40 16 60 4	P40 16 60 5					
300 x 300	P90 10 60 4	P90 10 60 5					

References beginning by :
P30 = thickness 30 mm / P40 = 40 mm / P90 B = 90 mm / P90 C=100 mm

Standard cable : FEP single layer.
Other cable available, see page 5.
Please ask for advise.

For the construction of the reference, see page 13.
All dimensions given with a tolerance of ± 10 mm .

Other voltage available 460V 3-ph : 3 kW, 4.5 kW, 6 kW, 9 kW, 12 kW, 15 kW

Flat heaters Codification

Construction of the reference number

P30	03	05	2	J	F	0	0	A	1
thickness code	JxK code	power code	voltage code	exit code	cable code	N length code	C length code	assembly code	materials code
P30=30mm	03	05 = 0.5 kW	1 = 110V M	J = small side	F	0 = 1m	0 = 1m	A	1
P40=40mm	04	10 = 1 kW	2 = 230V M	K = large side	G	1 = 1,5m	1 = 1,5m	B	2
P90=90mm	...	15 = 1.5 kW	3 = 460V M		P	2 = 2 m	2 = 2 m	C	3
		20 = 2 kW	4 = 230V T		D	3 = 2,5m	3 = 2,5m	D	4
		30 = 3 kW	5 = 400V T		E	4 = 3m	4 = 3m	F	5
		40 = 4 kW	6 = 460V T		H	5 = 3,5m	5 = 3,5m	H	6
		45 = 4.5 kW				6 = 4m	6 = 4m		7
		60 = 6 kW				7 = 4,5m	7 = 4,5m		8
		90 = 9 kW				8 = 5m	8 = 5m		
		12 = 12 kW				9 = sup.5m	9 = sup.5m		

cable code details

F = FEP single layer 1 W/cm²
G = FEP double layer 1 W/cm²
P = PFA single layer 1 W/cm²
D = PFA double layer 1 W/cm²
E = PFA double layer 0,5 W/cm²
H = PFA single layer 0,5 W/cm²

assembly code details

A = coated frame
B = coated frame + bracket
C = strip frame
D = strip frame + perpendicular
F = with a rod frame
H = for rod frame

support materials code

code	frame	strips	other pieces
1	PVDF	PVDF	PVDF
2	PP	PP	PP
3*	FEP	FEP	-
4	FEP	FEP	PVDF
5	FEP	FEP	PP
6	PVDF	FEP	PVDF
7	PP	FEP	PP
8*	inox	FEP	-

The codes 1 2 4 5 6 7 are valid for the assembly types A B C D F

* for assembly type C only

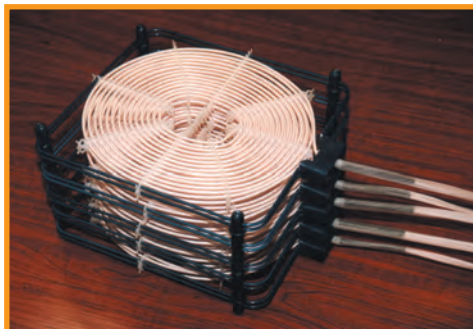
* for assembly types A & B only

) Heaters : special manufacture)

These heaters have been designed specifically to meet particular needs. Our commercial and technical team is at your disposal for any special requirement. Please contact us !



**INOX
frame**

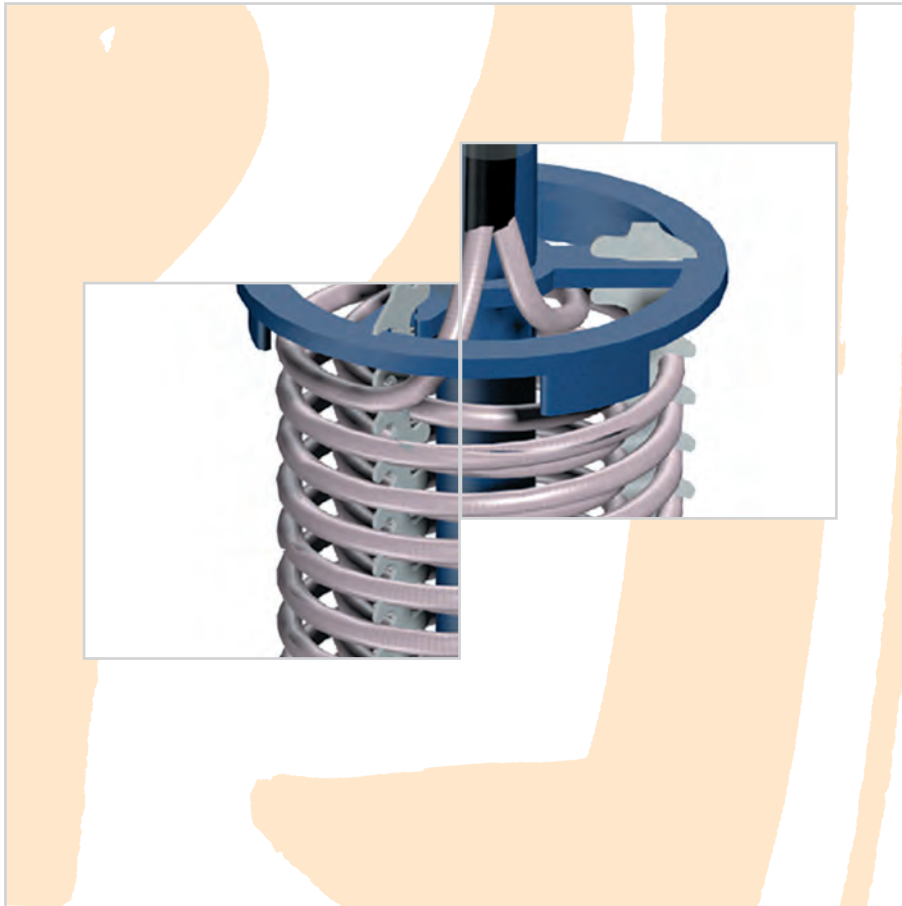


**Piled-up
frame**



**Piled-up
frame**

) Cylindrical heaters)



Assembly R

Assembly S

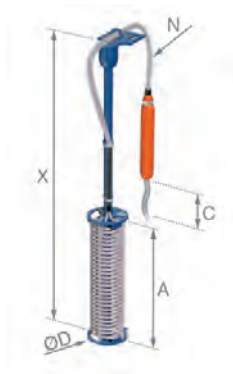
Assembly P

Assembly T
Control Therm

Assembly U
Control Therm

Cylindrical heaters Assemblies R, S & P

These models are made with an outside diameter of 85 and 120 mm. They are ideally suited to replace the classical bayonets.



Assembly type R

on a plastic rod structure \varnothing 20 mm

Intended for installation on the side of the tank

Structure material :
PP or PVDF

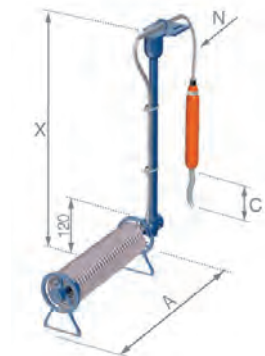


Assembly type S

like type R but without rod structure

Specially designed for low powers and limited use

Structure material :
PP or PVDF



Assembly type P

on a plastic rod structure \varnothing 20 mm with feet

Intended for installation at the bottom of the tank

Structure material :
PP or PVDF

Options & Accessories

(any other assembly type possible on request)

Extra length of cables



electrical cable **C** of type HO5 VV-F or HO7 RN-F
non heating cable **N** to go out of the tank

Feet for type S



in PP or PVDF for installation at the bottom of the tank (standard height 50 mm)
ref in PP : PICPP
ref in PVDF : PICPF

Guards



perforated plastic trellis, in PP only for C85 and C12 heaters
ref in PP : PRCPP

Cable-gland \varnothing 75 mm



allow between 200 to 300 mm extra on the H length (H=installation height on N)
ref in PP : PEPP
ref in PVDF : PEPF

Cylindrical heaters Reference table

single-phase					three-phases					
kW		ØD	A	230V	kW		ØD	A	230V	400V
A S S E M B L Y T Y P E R										
0.5 kW	sg-ph	85	160	C85052	1.5 kW	3ph	85	450	C85154	C85155
1 kW	sg-ph	85	255	C85102	3 kW	3ph	85	725	C85304	C85305
1.5 kW	sg-ph	85	310	C85152	4.5 kW	3ph	85	890	C85454	C85455
2 kW	sg-ph	85	390	C85202	4.5 kW	3ph	125	560	C12454	C12455
3 kW	sg-ph	85	620	C85302	6 kW	3ph	85	1135	C85604	C85605
4 kW	sg-ph	85	730	C85402	6 kW	3ph	125	710	C12604	C12605
5 kW	sg-ph	85	850	C85502	9 kW	3ph	125	1120	C12904	C12905
6 kW	sg-ph	85	1135	C85602	12 kW	3ph	125	1300	C12124	C12125
6 kW	sg-ph	125	710	C12602	15 kW	3ph	125	1540	C12134	C12135
A S S E M B L Y T Y P E S										
0.5 kW	sg-ph	85	150	C85052	1.5 kW	3ph	85	470	C85154	C85155
1 kW	sg-ph	85	240	C85102	3 kW	3ph	85	735	C85304	C85305
1.5 kW	sg-ph	85	300	C85152	4.5 kW	3ph	85	915	C85454	C85455
2 kW	sg-ph	85	380	C85202	4.5 kW	3ph	125	585	C12454	C12455
3 kW	sg-ph	85	610	C85302	6 kW	3ph	85	1160	C85604	C85605
4 kW	sg-ph	85	720	C85402	6 kW	3ph	125	740	C12604	C12605
5 kW	sg-ph	85	840	C85502	9 kW	3ph	125	1145	C12904	C12905
6 kW	sg-ph	85	1160	C85602	12 kW	3ph	125	1340	C12124	C12125
6 kW	sg-ph	125	740	C12602	15 kW	3ph	125	1565	C12134	C12135
A S S E M B L Y T Y P E P										
0.5 kW	sg-ph	85	225	C85052	1.5 kW	3ph	85	505	C85154	C85155
1 kW	sg-ph	85	315	C85102	3 kW	3ph	85	800	C85304	C85305
1.5 kW	sg-ph	85	375	C85152	4.5 kW	3ph	85	955	C85454	C85455
2 kW	sg-ph	85	455	C85202	4.5 kW	3ph	125	625	C12454	C12455
3 kW	sg-ph	85	685	C85302	6 kW	3ph	85	1200	C85604	C85605
4 kW	sg-ph	85	795	C85402	6 kW	3ph	125	775	C12604	C12605
5 kW	sg-ph	85	915	C85502	9 kW	3ph	125	1185	C12904	C12905
6 kW	sg-ph	85	1200	C85602	12 kW	3ph	125	1360	C12124	C12125
6 kW	sg-ph	125	775	C12602	15 kW	3ph	125	1605	C12134	C12135

ØD = outside diameter / A = overall length of the heating part ; all the dimensions are given with a tolerance of ± 10 mm

Other voltages available : • 110V single-phase : from 0.5 kW to 2 kW • 460V single-phase : from 1 kW to 6 kW • 460V three-phases : from 3 kW to 15 kW • Standard cable coating : FEP single layer. Other coatings, see page 5. Please ask for advice. For the construction of the reference, see page 20.

Cylindrical heaters Control-Therm assembly T

n e w

This heater with built-in regulation has been especially developed for use in small tanks when low power is needed in a reduced space.

It is a complete device combining heating and regulation : the heater, the temperature sensor and the switching circuit are integrated in one single unit.

Thermostat technical data

Control range : 0 to 90°C

Contact : 1 changeover

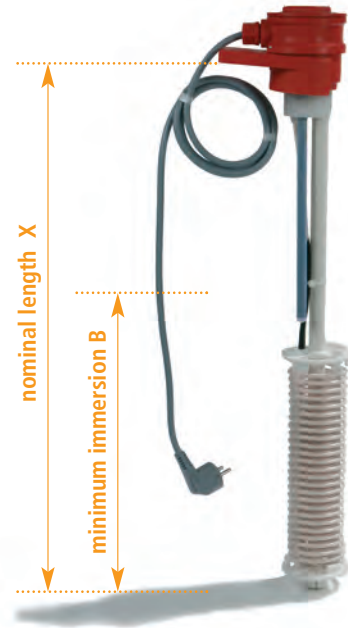
Switched power : max. 3,45 kW (15A/230V/~)

Hysteresis : ±4K

Minimum temperature variation : 1K/min

Minimum immersion tube length : 200 mm

Maximum immersion tube length : 1000 mm



Power (kW)	Nominal length X (mm)	Mini. immersion depth B (mm)	Heaters Reference materials : all PP	Heaters Reference materials : all PVDF	Heaters Reference PVDF and PP casing
0,5	450	220	C850520F02T2	C850520F02T1	C850520F02T9
1,0	500	335	C851020F02T2	C851020F02T1	C851020F02T9
1,5	630	390	C851520F02T2	C851520F02T1	C851520F02T9
2,0	800	470	C852020F02T2	C852020F02T1	C852020F02T9
3,0	1000	700	C853020F02T2	C853020F02T1	C853020F02T9

On request the X length can also be manufactured differently

Choose PVDF casing whenever temperature is above 80°C or with oxidising chemicals

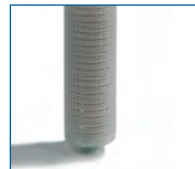
Options & Accessories

Extra length of cable



electrical cable C
of type HO5 VV-F
Supplied with plug
Standard length 2 metres

Guard (optional)



a perforated plastic guard
materials : PP
ref in PP : PRCPP

wrench US (supplied)



universal wrench

HWB Support (supplied)



Dimensions
total height 43 mm
total length 130 mm
fixing height 15 mm
materials : PP

Cylindrical heaters Control-Therm assembly U)

new

As Control-Therm type T this device integrates also in one single unit the heater, the temperature sensor and the switching circuit.

This model is the best adapted solution for use into tanks with a variable or low liquid level.

Thermostat technical data

Control range : 0 to 90°C

Contact : 1 changeover

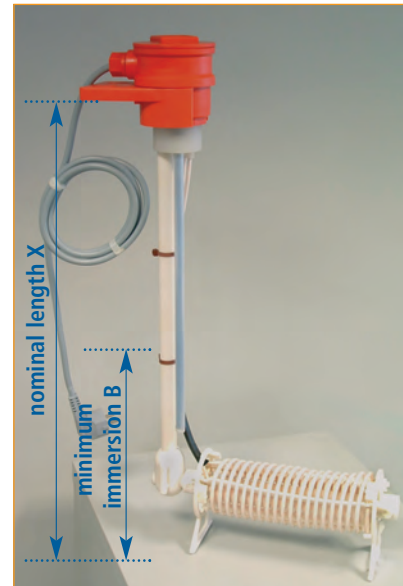
Switched power : max. 3,45 kW (15A/230V/~)

Hysteresis : ±4K

Minimum temperature variation : 1K/min

Minimum immersion tube length : 200 mm

Maximum immersion tube length : 1000 mm



Power (kW)	Nominal length X (mm)	Mini. immersion depth B (mm)	Heaters Reference materials : all PP	Heaters Reference materials : all PVDF	Heaters Reference PVDF and PP casing
0,5	450	220	C850520F02U2	C850520F02U1	C850520F02U9
1,0	500	220	C851020F02U2	C851020F02U1	C851020F02U9
1,5	630	220	C851520F02U2	C851520F02U1	C851520F02U9
2,0	800	220	C852020F02U2	C852020F02U1	C852020F02U9
3,0	1000	220	C853020F02U2	C853020F02U1	C853020F02U9

On request the X length can also be manufactured differently

Choose PVDF casing whenever temperature is above 80°C or with oxidising chemicals

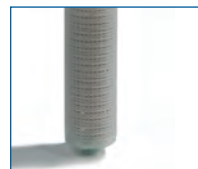
Options & Accessories

Extra length of cable



electrical cable C
of type HO5 VV-F
Supplied with plug
Standard length 2 metres

Guard (optional)



a perforated plastic guard
materials : PP
ref in PP : PRCPP

wrench US (supplied)



universal wrench

HWB Support (supplied)



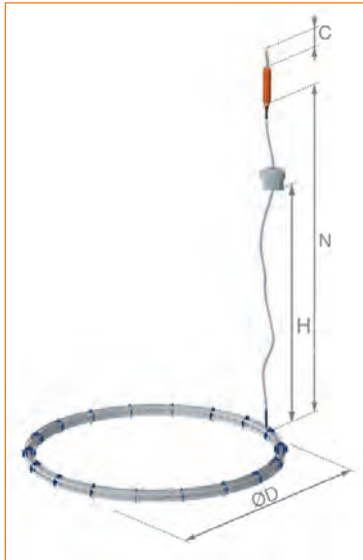
Dimensions
total height 43 mm
total length 130 mm
fixing height 15 mm
materials : PP

) Annular heaters)



Annular heaters Assembly T09 & T16

Heaters designed specifically to keep liquid storage tanks from freezing.



H : this dimension corresponds to the installation height of the the cable-gland on the N part.

To ensure a proper positioning and avoid mechanical damage of the cable, please allow between 200mm to 300 mm extra on the H length.

N : on request it is possible to manufacture a non heating part N longer than 10 metres.



T09-Diameter : Ø500 mm to Ø2000 mm

flexible structure in PP or PVDF

Can be passed through the inspection trap without interfering with the tank (trap door Ø300mm minimum) . The section of the T09 heater feet excluded is circular : Ø65 mm

T16V-Diameter : Ø500 mm to Ø2000 mm

flexible structure in PP or PVDF

Can be passed through the inspection trap without interfering with the tank (trap door Ø500mm minimum) . The section of the T16V heater feet excluded is rectangular : 150 x 75 mm

Options & Accessories

Extra length of cables



electrical cable C
of type HO5 VV-F
or HO7 RN-F
non heating cable N
to go out of the tank

Cable-gland Ø75 mm



allow between 200 to 300 mm extra on the H length (H=installation height on N)
ref in PP : PEPP
ref in PVDF : PEPF

Ballasted feet



T09 feet



T16 feet

Ballasted feet in PP or PVDF to raise the heater. Ballasted feet are necessary in very dense or encrusting solutions with density > 1,4 (standard height 50 mm).
ref in PP : PITPP
ref in PVDF : PITPF

Annular heaters Reference table

single-phase 230V reference numbers							
outside Ø	0,5 kW	1 kW	1,5 kW	2 kW	3 kW	4 kW	6 kW
500 mm	T09 05 052	T09 05 102	T09 05 152	T09 05 202			
600 mm	T09 06 052	T09 06 102	T09 06 152	T09 06 202	T16 06 302		
700 mm	T09 07 052	T09 07 102	T09 07 152	T09 07 202	T16 07 302	T16 07 402	
800 mm	T09 08 052	T09 08 102	T09 08 152	T09 08 202	T09 08 302	T16 08 402	
900 mm	T09 09 052	T09 09 102	T09 09 152	T09 09 202	T09 09 302	T16 09 402	
1000 mm	T09 10 052	T09 10 102	T09 10 152	T09 10 202	T09 10 302	T09 10 402	T16 10 602
1100 mm	T09 11 052	T09 11 102	T09 11 152	T09 11 202	T09 11 302	T09 11 402	T16 11 602
1200 mm		T09 12 102	T09 12 152	T09 12 202	T09 12 302	T09 12 402	T16 12 602
1300 mm		T09 13 102	T09 13 152	T09 13 202	T09 13 302	T09 13 402	T16 13 602
1400 mm		T09 14 102	T09 14 152	T09 14 202	T09 14 302	T09 14 402	T09 14 602
1500 mm		T09 15 102	T09 15 152	T09 15 202	T09 15 302	T09 15 402	T09 15 602
1600 mm		T09 16 102	T09 16 152	T09 16 202	T09 16 302	T09 16 402	T09 16 602
1700 mm		T09 17 102	T09 17 152	T09 17 202	T09 17 302	T09 17 402	T09 17 602
1800 mm		T09 18 102	T09 18 152	T09 18 202	T09 18 302	T09 18 402	T09 18 602
1900 mm		T09 19 102	T09 19 152	T09 19 202	T09 19 302	T09 19 402	T09 19 602
2000 mm		T09 20 102	T09 20 152	T09 20 202	T09 20 302	T09 20 402	T09 20 602

three-phases 400V reference numbers						
outside Ø	1,5 kW	3 kW	4,5 kW	6 kW	9 kW	12 kW
500 mm	T09 05 155					
600 mm	T09 06 155	T16 06 305				
700 mm	T09 07 155	T16 07 305				
800 mm	T09 08 155	T09 08 305	T16 08 455			
900 mm	T09 09 155	T09 09 305	T16 09 455			
1000 mm	T09 10 155	T09 10 305	T16 10 455	T16 10 605		
1100 mm	T09 11 155	T09 11 305	T09 11 455	T16 11 605		
1200 mm	T09 12 155	T09 12 305	T09 12 455	T16 12 605		
1300 mm	T09 13 155	T09 13 305	T09 13 455	T16 13 605		
1400 mm	T09 14 155	T09 14 305	T09 14 455	T09 14 605		
1500 mm	T09 15 155	T09 15 305	T09 15 455	T09 15 605	T16 15 905	
1600 mm	T09 16 155	T09 16 305	T09 16 455	T09 16 605	T16 16 905	
1700 mm	T09 17 155	T09 17 305	T09 17 455	T09 17 605	T16 17 905	T16 17 125
1800 mm	T09 18 155	T09 18 305	T09 18 455	T09 18 605	T16 18 905	T16 18 125
1900 mm	T09 19 155	T09 19 305	T09 19 455	T09 19 605	T16 19 905	T16 19 125
2000 mm	T09 20 155	T09 20 305	T09 20 455	T09 20 605	T16 20 905	T16 20 125

Outside diameter $\pm 5\%$

When ordering, state :

the reference number given above by the table of dimensions

the frame & the support strips materials (PVDF or PP)

the N (non heating part) & the C (electric cable) lengths tolerance of ± 50 mm

Annular heaters Codification

Construction of the reference number

T09	05	05	2	0	F	0	0	T	1
type code	diameter code	power code	voltage code	0	cable code	N length code	C length code	assembly code	materials code
T09	05=ø500	05 = 0.5 kW	1 = 110V M	0	F	0 = 1m	0 = 1m	T	1
T16	06=ø600	10 = 1 kW	2 = 230V M		G	1 = 1,5m	1 = 1,5m	V	2
	...	15 = 1.5 kW	3 = 460V M		P	2 = 2 m	2 = 2 m		
		20 = 2 kW	4 = 230V T		D	3 = 2,5m	3 = 2,5m		
		30 = 3 kW	5 = 400V T		E	4 = 3m	4 = 3m		
		40 = 4 kW	6 = 460V T		H	5 = 3,5m	5 = 3,5m		
		45 = 4.5 kW				6 = 4m	6 = 4m		
		60 = 6 kW				7 = 4,5m	7 = 4,5m		
		90 = 9 kW				8 = 5m	8 = 5m		
		12 = 12 kW				9 = > 5m	9 = > 5m		

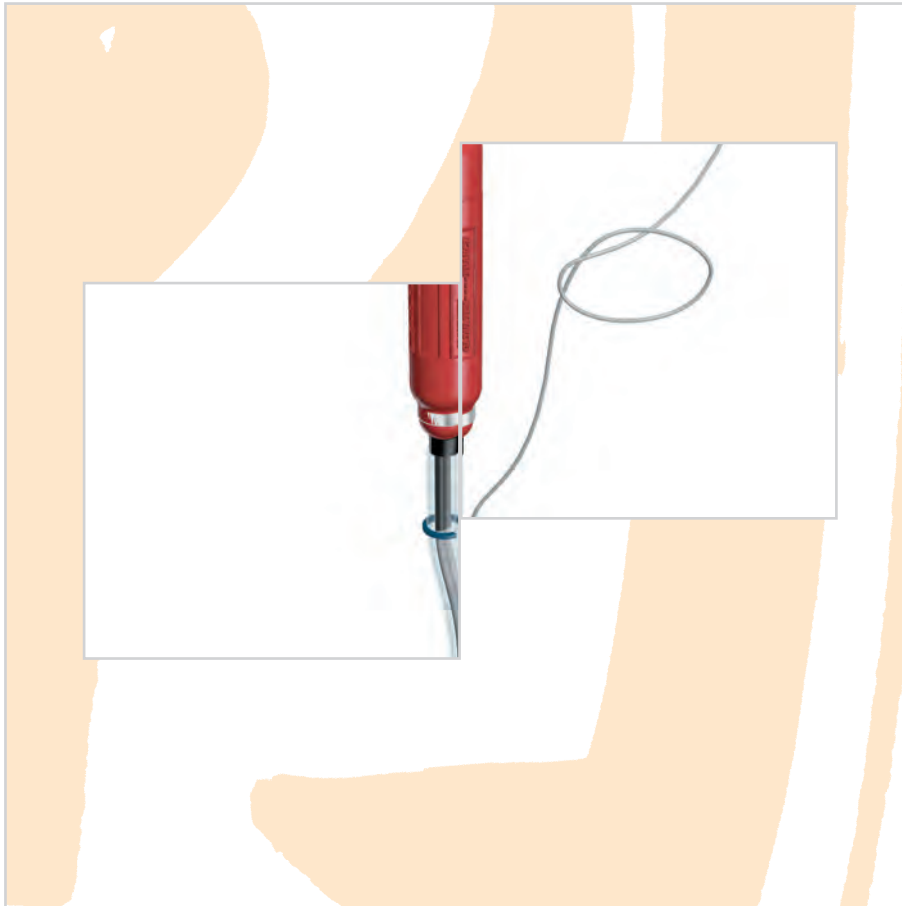
cable code details

F = FEP single layer 1 W/cm²
G = FEP double layer 1 W/cm²
P = PFA single layer 1 W/cm²
D = PFA double layer 1 W/cm²
E = PFA double layer 0,5 W/cm²
H = PFA single layer 0,5 W/cm²

support materials code

code	strips	other parts
1 =	PVDF	PVDF
2 =	PP	PP

) Regulation)



) Probes)

**A range of temperature probes insulated by a Teflon® sheath.
PT100 and thermocouple J probes**

Platinum resistance probe : waterproof probe with a PT100 sensor (100 ohms / 0°C class B). Connection to the sensor is by two or three insulated wires in a special Teflon® insulated cable.

Thermocouple probe : type J thermocouple wire insulated with Teflon® sleeving. The hot junction tip is protected by a Teflon® shrink tube.



Flexible probe

ASSEMBLY TYPE S

Teflon® coated PT100 or thermocouple J flexible probe to install on a rigid support
Standard length L = 1500 mm
(unlimited L length)



Probe mounted on heater

ASSEMBLY TYPE T

Teflon® coated PT100 or thermocouple J probe installed by manufacturer.
Closed tanks : the probe goes through the same cable-gland as the one of the heater (unlimited length)



Bendeable rigid probe

ASSEMBLY TYPE B

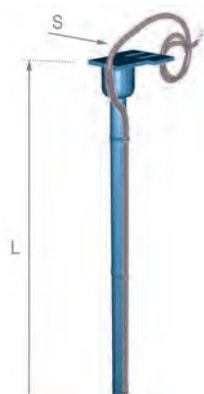
Teflon® coated PT100 or thermocouple J probe mounted on a PP or PVDF coated frame / L = 500, S = 1000
(maximum L = 2000)



Probe under rigid tube

ASSEMBLY TYPE R

PT100 or thermocouple J inserted into a Teflon® coated metallic tube. Mechanical protection against shocks. PVDF head and supports
L=300, S=1000 (maximum L = 1000)



Rigid probe on rod

ASSEMBLY TYPE F

Teflon® coated PT100 or thermocouple J probe mounted on a PP or PVDF rod
L = 500, S = 1000 / unlimited L length



Probe with cable-gland

ASSEMBLY TYPE P

Teflon® coated PT100 or thermocouple J probe mounted on a PP or PVDF rod
L = 500, S = 1000 / unlimited L length

) Probes Codification)

Construction of the reference number

S O P T 2	F	1 5	0 0	S	0
code for probe type	code for probe materials	code for flexible length	code for rigid length	assembly type code	code for support materials
SOPT2 = PT100 2 leads SOPT3 = PT100 3 leads SOTCJ = thermocouple J	F = FEP	10 = 1 m 15 = 1,5 m 20 = 2 m 25 = 2,5 m 99 = > 9,9 m	00 = no rigid length 05 = 0,5 m 06 = 0,6 m 07 = 0,7 m 08 = 0,8 m	S T B R F P	0 1 2

assembly type code

- S = flexible
- T = flexible on heater
- B = stainless steel rigid
- R = inside rigid tube
- F = rigid on rod
- P = rigid on rod + cable-gland

support materials code

- | code | materials |
|------|------------------|
| 0 = | without assembly |
| 1 = | PVDF |
| 2 = | PP |

) Control boxes)

PID digital display control boxes with input PT100 3 wires.
They are simple to use, ready to plug and compact !



*PIDMONO : up to 5 kW
230V single-phase*

Simplicity

On-off switch with indicator light on the front

Four cable-glands (2 x PG16 et 2 x PG11) for : box supply, immersion heater, probe and level

Safety

a 30 mA earth leakage circuit breaker, a contactor,

2 fuses on a fuse-carrier (PIDMONO model) ou 4 fuses on 2 fuse-carriers (PIDTRI model)

External security loop connected (level security)



*PIDTRI : up to 15 kW
400V three-phases*

Compacts

PIDMONO

Dimensions (L x H x P) : 335 x 280 x 155 mm
IP65 plastic box with clear front

PIDTRI

Dimensions (L x H x P) : 445 x 280 x 155 mm
IP65 plastic box with clear front

Options & Accessories

PT100 3 wires probes



see page 26

Float switches



please contact us

) Safety measures)

Connection

Ensure that the nominal voltage which is indicated on the connection corresponds to that of the mains.

The connection must be kept outside the tank and out of vapours. The infiltration of liquids in the connection can lead to the failure of the heater.

Earth

The flexible electrical cable is made of 3 or 4 conductors (single-phase/three phases) and is protected either with PVC for type HAR HO5 VV-F or polychloroprene or equivalent for type HO7 RN-F.

The earthing **must** be connected to the earth with the yellow-green conductor of the electricity supply cable.

The fitting of an automatic earth leakage circuit breaker per heater is strongly recommended to provide extra safety (30 milliamps tripping in accordance with the VDE 066 rule).

Non heating part

Used at the bottom or on the side of the tank the bending radius of the non heating part N is of at least 100 mm. Right angle bending is not recommended as it may damage the heater.

The minimum level of liquid necessary to operate is indicated by a permanent black mark on the non heating part N.

Heating part

The heating part of the heater must be completely immersed when operating. It may be installed at the bottom of the tank or along an inner wall.

The heating part must be installed at approximately 200 mm under the liquid level so that it does not become uncovered should the level drop.

If a heater is allowed to work out of the solution it will become irreparably damaged. Contact with air when working destroys the inner insulations of the heater in a few seconds because of the sudden rise in temperature of the heater. Plan also to raise the heater off the bottom of the tank so that there is a space for any deposits or sludge build up.

Make sure nothing will touch nor crush the heating cable. The heater must be protected against mechanical damage by a separate heating compartment, railings or guard.

After switching the heater off allow it to cool down for 15 minutes before removing it from the tank.

Cleaning

The accumulation of deposits on the cable reduces the heat exchange. The cable overheats and the inner insulations get destroyed.

Though deposits accumulate more slowly on our heaters (through low thermic charge) they must however be checked regularly and chemically cleaned with a suitable acid.

Manufacturer's guarantee : one year from date of invoice or 15 months from date of manufacture provided the above safety measures are followed. For any specific or unusual use please contact us.

) installatin power enquiry form)

Please copy this page and send it by mail or fax to your supplier

1 - Your details

Cie :

Name :

Date :

Phone

Fax.

2 - Description of liquid

Supplier	Data	Plastics recommended by supplier
Name :	pH :	<input type="checkbox"/> Teflon®
Contents :	operating temperature :	<input type="checkbox"/> PP
	heat capacity - Cp :	<input type="checkbox"/> PVDF
	density :	<input type="checkbox"/> Others (to precise)
	degradation temperature :	

3 - Installation

Tank <input type="checkbox"/> rectangular <input type="checkbox"/> cylindrical	Top <input type="checkbox"/> lid <input type="checkbox"/> balls <input type="checkbox"/> closed tank	Running conditions ambient temperature : initial temperature : operating temperature : heat-up time required :
Dimensions length / diameter (mm) : width (mm) : height (mm) : liquid volume (L) : liquid height (mm) :	Ventilation <input type="checkbox"/> yes <input type="checkbox"/> no debit (m ³ /h) :	Plant sketch
Tank materials <input type="checkbox"/> plastic <input type="checkbox"/> metallic name of material : thickness (mm) :	Wind (outside installation) <input type="checkbox"/> light <input type="checkbox"/> medium <input type="checkbox"/> heavy	
Insulation <input type="checkbox"/> single layer <input type="checkbox"/> double layer insulation material : thickness (mm) :	Electrical supply voltage (V) : <input type="checkbox"/> single-phase <input type="checkbox"/> three-phases	