

# Electric Heater

Heats the pool water easily and effectively



Products from Pahlén Pool System,  
for a trouble-free pool ownership.

For more information: [www.pahlen.com](http://www.pahlen.com)



Made in Sweden

## Heating - Electric heaters, simple and effective



Simple installation.  
We went swimming next day.



**Pahlén's electric heaters heats the water easily and effectively.** An electric heater is easy to be connected to the existing power mains in order to deliver full power round the clock. Water from the swimming pool circulation system flows through the heater and is heated by the heating element. Pahlén heaters are compact and can be installed in all kind of swimming pools, spas and large public facilities. The materials used are acid proof stainless steel EN 1.4404, Incoloy 825, titanium and thermoplastic. All electric heaters are designed for continuous flow with the lowest possible pressure drop.

# Electric heaters for all types of pools



## Compact 3-18kW

Made of titanium/Nic-Tech or EN 1.4404 acid proof stainless steel/Incoloy 825. Supplied with thermostat, overheating cut out, flow switch or pressure switch.



## Aqua compact 3-18kW

Made of thermoplastic with heating element of Incoloy 825 or titanium. Supplied with thermostat, overheating cut out and flow switch.



## Aqua spa 1.5-2.0kW

Made of thermoplastic with heating element of Incoloy 825. A small, compact heater for spa pools and small swimming pools. Adjustable thermostat, overheating cut out and flow switch are standard.



## Aqua HL 3-15kW

Made of thermoplastic with heating element of Incoloy 825 or titanium. Electric swimming pool heater features digital control and electronic thermostat. Built-in overheating cut out and flow switch are standard.



## MidiHeat 18-72kW

MidiHeat is manufactured from materials of the highest quality. With digital or analogue temperature control. Effective heater for larger swimming pools. Overheating cut out and flow switch are standard.

# Electric heater



## Compact 3-18kW

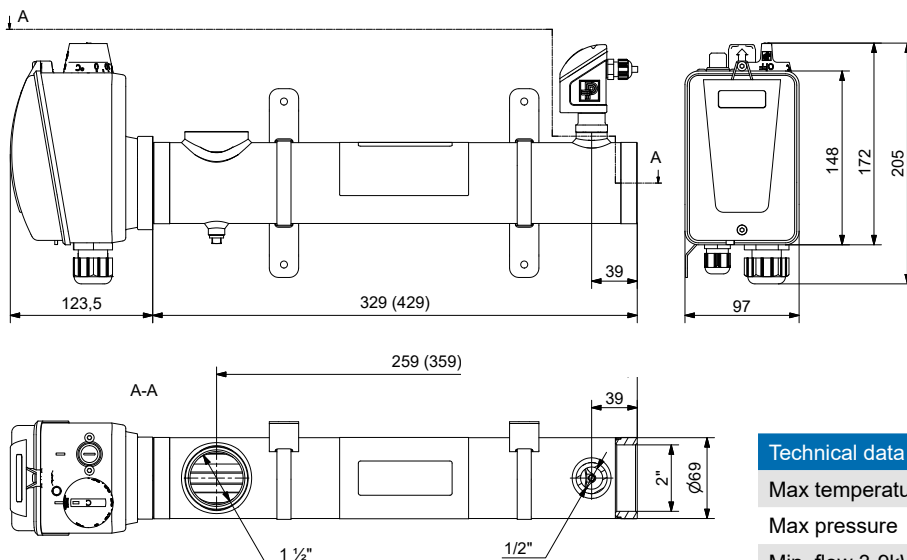
Supplied with a thermostat and overheating cut out. A flow switch or pressure switch protects the heating element from damage if the flow to the heater is insufficient.

These electric heaters are available in both titanium/Nic-Tech and acid proof stainless steel EN 1.4404/Incoloy 825. All compact electric heaters are delivered with a 2" heating element. Max. pressure: 4 bar.

Suitable for private pools up to 100 m<sup>3</sup>

### Features

- Body and pipework of acid proof stainless steel EN 1.4404. Heating elements of Incoloy 825
- Selected models with body made of titanium and Nic-Tech treated heating elements
- Equipped with thermostat, overheating cut out and flow switch
- Small and compact
- Adjustable brackets of acid proof stainless steel
- Connection 1 1/2"



Dimensions for 9 - 18kW within brackets

Technical data	With flow switch	With pressure switch
Max temperature	60°C	60°C
Max pressure	2.5 bar	4 bar
Min. flow 3-9kW	85 l/min	20 l/min
Min. flow 12-18kW	85 l/min	40 l/min

## With pressure switch. Max 4 bar

Unipolar thermostat 0-45°C, pressure switch, unipolar high limit control 60°C

Item no.	Type	kW	Ampere 3-phase		kg
			230V	400V	
13982403	11P30	3.0	8	5	2.8
13982406	11P60	6.0	15	9	2.8
13982409	11P90	9.0	23	14	3.2
13982412	11P120	12.0	31	18	3.2
13982415	11P150	15.0	38	22	3.2
13982418	11P180	18.0	46	27	3.2

## With flow switch. Max 2.5 bar

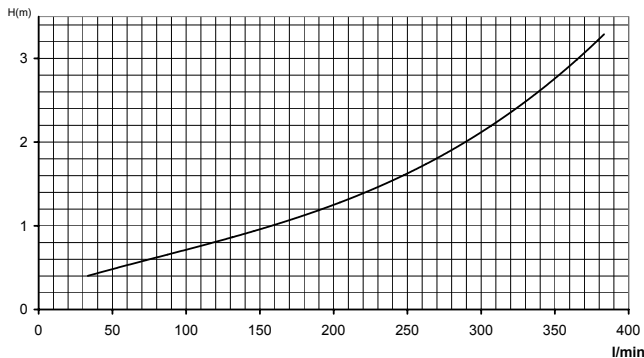
Unipolar thermostat 0-45°C, flow switch, unipolar high limit control 60°C

Item no.	Type	kW	Ampere 3-phase		kg
			230V	400V	
13981403*	11F30*	3.0	8	5	2.4
13981406*	11F60*	6.0	15	9	2.4
13981409*	11F90*	9.0	23	14	2.7
13981412*	11F120*	12.0	31	18	2.7
13981415*	11F150*	15.0	38	22	2.7
13981418*	11F180*	18.0	46	27	2.7

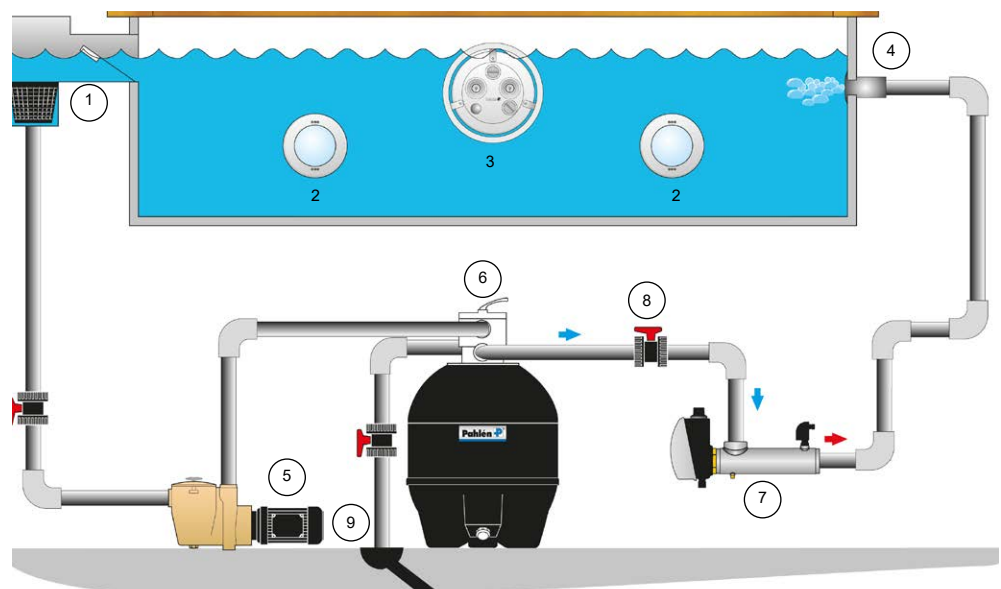
\*Available with outer jacket made of titanium and Nic-Tech treated heating element. These heaters are designed for pools with very aggressive water, large quantities of chlorides and where there is a high risk for corrosion, e.g. in pools with salt water.

When ordering titanium model, choose compact electric heater and add a "T" after the item no. Applies to the following article 139814xxT.

Pressure drop



1. Skimmer
2. Light
3. Jet Swim
4. Inlet
5. Pump
6. Filter
7. Compact
8. Flow switch
9. Drain



# Electric heater



## Aqua Compact 3-18kW

Electric heater made of thermoplastic for extra strength. Heating element made of Incoloy 825 or titanium for extra safety in installations where there is a high risk of corrosion, e.g. salt water pools.

Supplied with a thermostat for adjusting pool temperature as well as overheating cut out and flow switch.

Minimum flow 90 l/min. Max. pressure: 2.5 bar.  
Suitable for private pools up to 100 m<sup>3</sup>

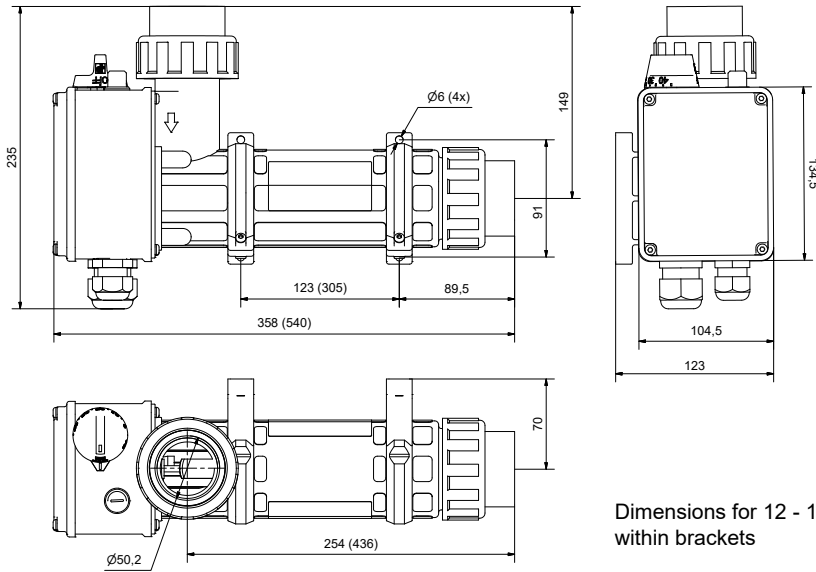
### Features

- Electric heater made of fibreglass reinforced thermoplastic
- Housing of thermoplastic
- Horizontal installation
- Heating elements of Incoloy 825 or titanium
- Equipped with thermostat, overheating cutout and flow switch
- Slip connections for bonding of Ø 50 mm pipes

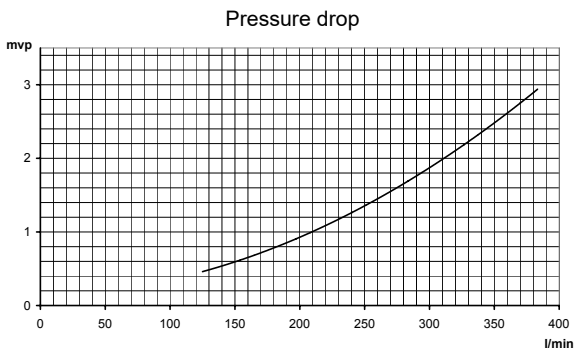
### Technical data

Heating element Incoloy 825			Heating element titanium			Ampere 3-phase		
Item no.	Type	kg	Item no.	Type	kg	kW	230V 3~	400V 3~
141600	AC30	1.7	141600T	AC30T	1.7	3.0	8	5
141601	AC60	1.7	141601T	AC60T	1.7	6.0	15	9
141602	AC90	1.7	141602T	AC90T	1.7	9.0	23	14
141603	AC120	2.2	141603T	AC120T	2.1	12.0	31	18
141604	AC150	2.2	141604T	AC150T	2.1	15.0	38	22
141605	AC180	2.2	141605T	AC180T	2.1	18.0	46	27

Also available with connections 1 ½" pipe or 1 ½" threaded.

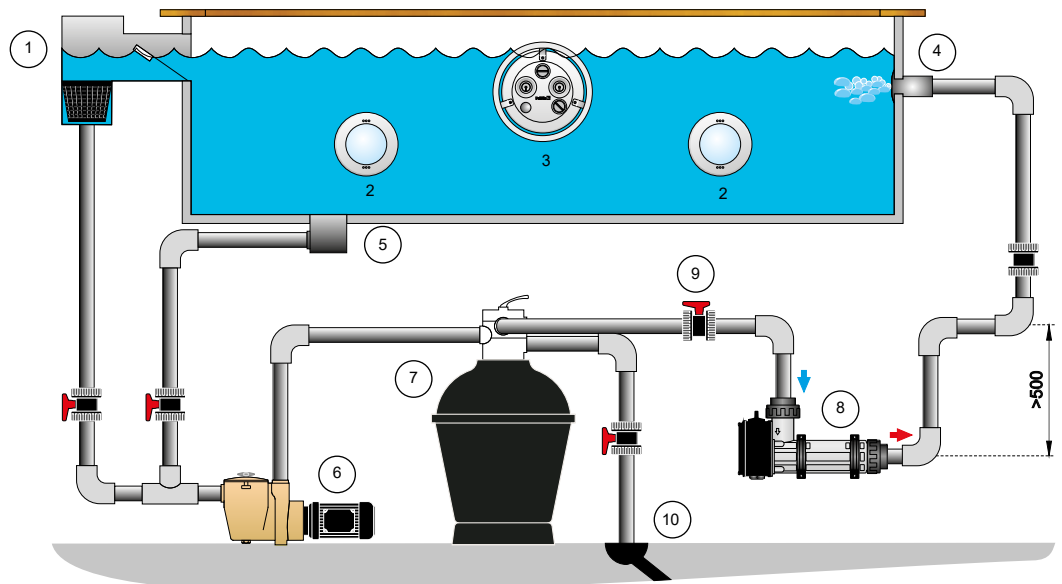


Dimensions for 12 - 18kW  
within brackets



For pools with salt water or chlorinator we recommend a heating element of titanium.

1. Skimmer
2. Light
3. Jet Swim
4. Inlet
5. Main drain
6. Pump
7. Filter
8. Aqua compact
9. Flow switch
10. Drain





## Aqua spa 1.5-2.0kW

A small, compact heater for spa pools and small swimming pools. It is available with capacities from 1.5 to 3.0 kW. The heater is made of thermoplastic and has a heating element made of Incoloy 825. Adjustable thermostat, overheating cut out and flow switch are standard.

Minimum flow 90 l/min.  
Suitable for spa, hot tubs and smaller pools

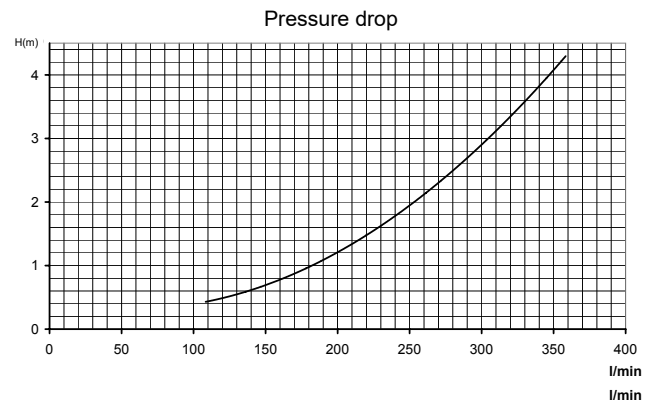
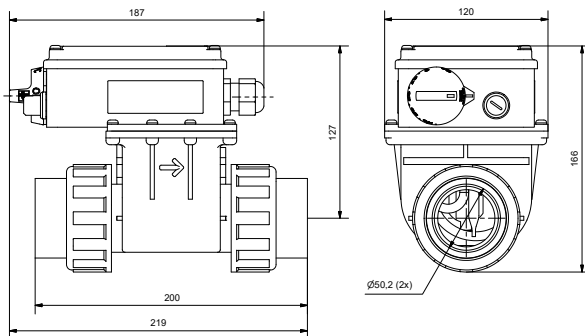
### Technical data 1-phase 230V

Item no.	Type	kW	Length mm	Pipe connection	Amp.	kg
141650	AS15	1.5	200	Ø 50 mm	7	1.0
141651	AS20	2.0	200	Ø 50 mm	9	1.0

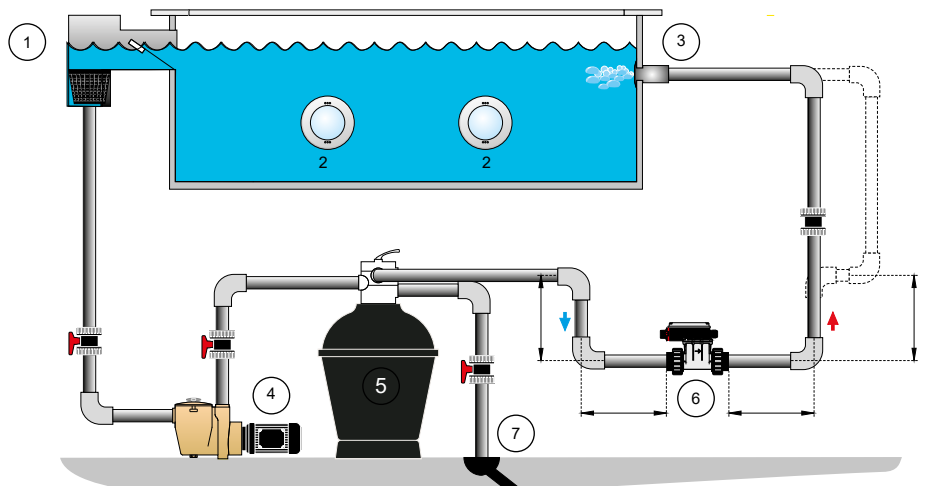
### Features

- Housing of thermoplastic
- Minimal dimensions
- Heating element of Incoloy 825
- Equipped with thermostat 0-45°C
- Overheating cut out and flow switch
- Slip connections for bonding of Ø 50 mm pipes

Also available with connections 1 1/2" pipe or 1 1/2" threaded.



1. Skimmer
2. Light
3. Inlet
4. Main drain
5. Pump
6. Aqua spa
7. Drain







# Electric heater



## Aqua HL 3-15kW

Aqua HL has a digital control, where the desired pool temperature can easily be set and the current pool temperature is shown in the LED display. In addition to an overheating protection and a flow switch, the heater has built-in contactors, that simplifies the connection of the heater.

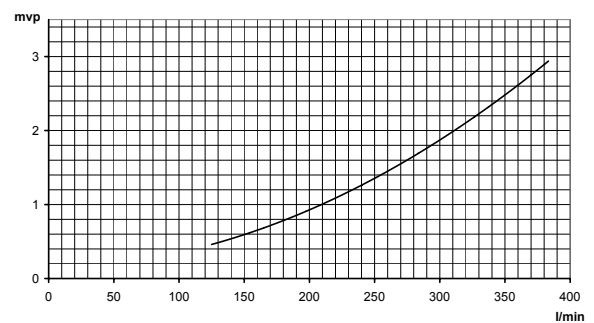
Rated output 3-15 kW. Made of thermoplastic with heating element made of Incoloy 825 or titanium.

Suitable for private pools up to 100 m<sup>3</sup>.  
Minimum flow 90 l/min.

### Features

- Capacity range 3-15kW
- Aqua HL comes with contactors and electronics
- Digital control and display
- Made of reinforced thermoplastic
- Horizontal installation
- Heating elements of Incoloy 825 or titanium
- Equipped with overheating limit control and flow switch
- Dual built-in contactors as per electrical safety standards
- Slip connections for bonding of Ø 50 mm pipes

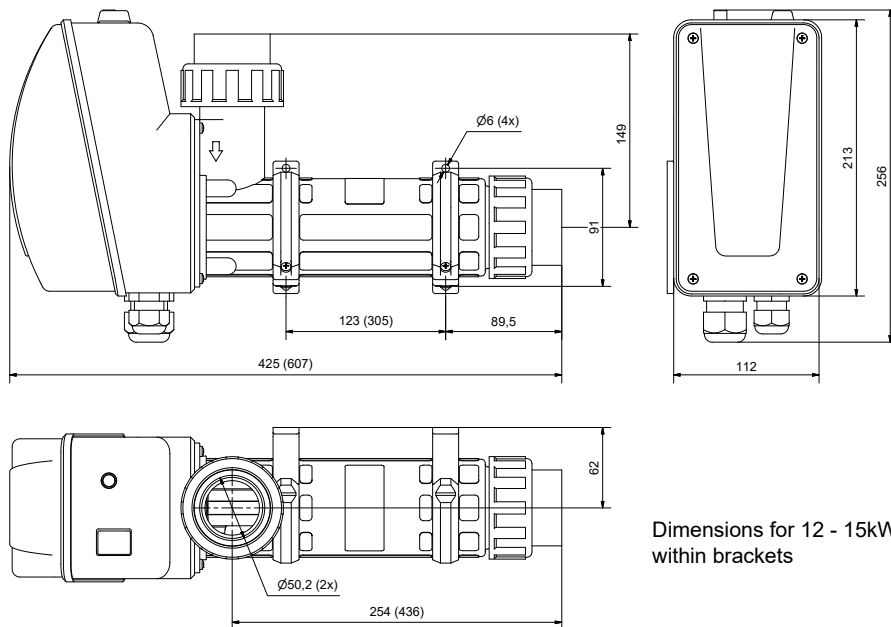
Pressure drop



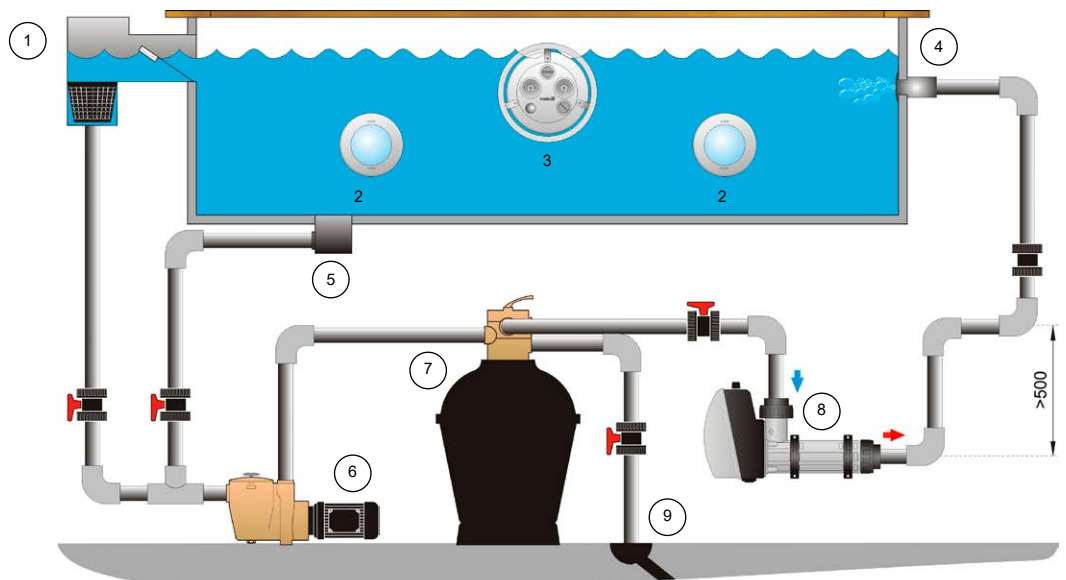
## Technical data

Heating element, Incoloy 825			Heating element, titanium			Ampere 3-phase/kW	
Item no.	Type	kg	Item no.	Type	kg	400V	415V
141800	D30	2.6	141800T	D30T	2.6	3.0kW 5A	3.5kW 5A
141801	D60	2.6	141801T	D60T	2.6	6.0kW 9A	6.5kW 9A
141802	D90	2.6	141802T	D90T	2.6	9.0kW 13A	10kW 14A
141803	D120	2.6	141803T	D120T	3.0	12.0kW 18A	13kW 18A
141804	D150	3.0	141804T	D150T	3.0	15.0kW 22A	16.2kW 23A
						1-phase 230V	3-phase 230V
141820	DS30-230	2.6	141820T	DS30T-230	2.6	3.0kW 13A	-
141821	DS60-230	2.6	141821T	DS60T-230	2.6	6.0kW 26A	-
141830	D30-230	2.6	141830T	D30T-230	2.6	-	3kW 8A
141831	D60-230	2.6	141831T	D60T-230	2.6	-	6kW 15A
141832	D90-230	2.6	141832T	-	2.6	-	9kW 23A

Also available with connections 1 1/2" pipe or 1 1/2" threaded.



1. Skimmer
2. Light
3. Jet Swim
4. Inlet
5. Main drain
6. Pump
7. Filter
8. Aqua HL
9. Drain



# Electric heater



MidiHeat Analogue EHA

MidiHeat Digital EHD

## MidiHeat 18-72kW

MidiHeat is manufactured from materials of the highest quality. The casing made of powder coated zinc sheet not only gives the product a very stable construction, it also makes the product highly resistant against corrosion.

MidiHeat has a temperature range of 8-45°C. Heating elements of titanium do not only make the heating highly effective, it also makes the heating element fully corrosion free.

### Additional safety

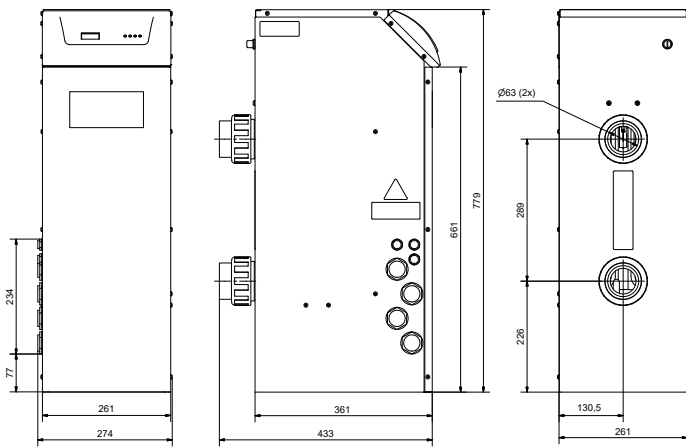
For the optimal safety and in accordance with applicable electrical safety standards MidiHeat has two built-in contactors for each heating element. A built-in flow switch and an overheating protection accompanied by an external input for pool water circulation.

Slip connections for bonding of  $\varnothing$  63 mm tube.  
Minimum Flow 170 l/min. Max flow 300 l/min.  
Max pressure: 2 bar.

MidiHeat functions extremely well in fresh water pools and in pools fitted with a salt chlorinator.

MidiHeat is also available in an analog version.

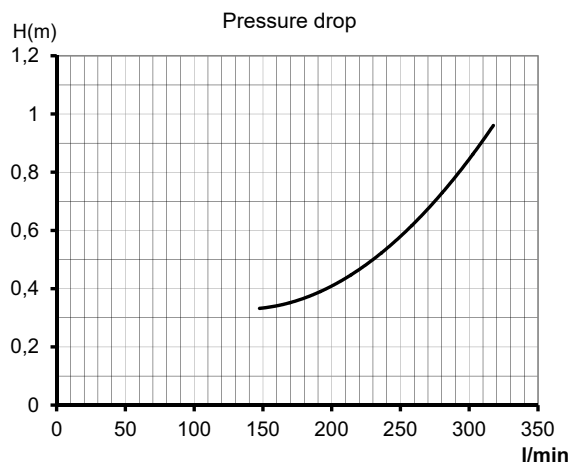
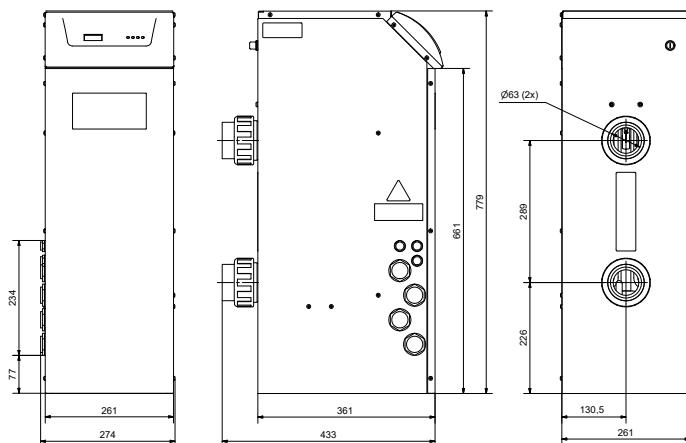
MidiHeat Digital EHD



## Features

- MidiHeat has two built-in contactors for each element
- Capacity 18-72kW
- Connect up to nine heaters and control them with a master unit
- MidiHeat is made of powder coated zinc sheet. Heat barrel in fibreglass reinforced polypropylene
- Heating elements of titanium
- Equipped with overheating limit control and flow switch
- Third-party tested and certified

MidiHeat Analogue EHA





## Digital control panel for the MidiHeat Digital

- Digital temperature control 8-45°C
- Master-/slave - connect up to nine heaters and control them with a master
- Activation delay - adjustable delay time for sequential start of the heating elements, 5-60 seconds
- Temperature offset - manually adjust the actual pool temperature, up to ±4°C
- Restore factory settings - option for resetting all settings
- Error codes - automatic storing of the last ten error messages

### Technical data for MidiHeat Digital EHD 380-415V

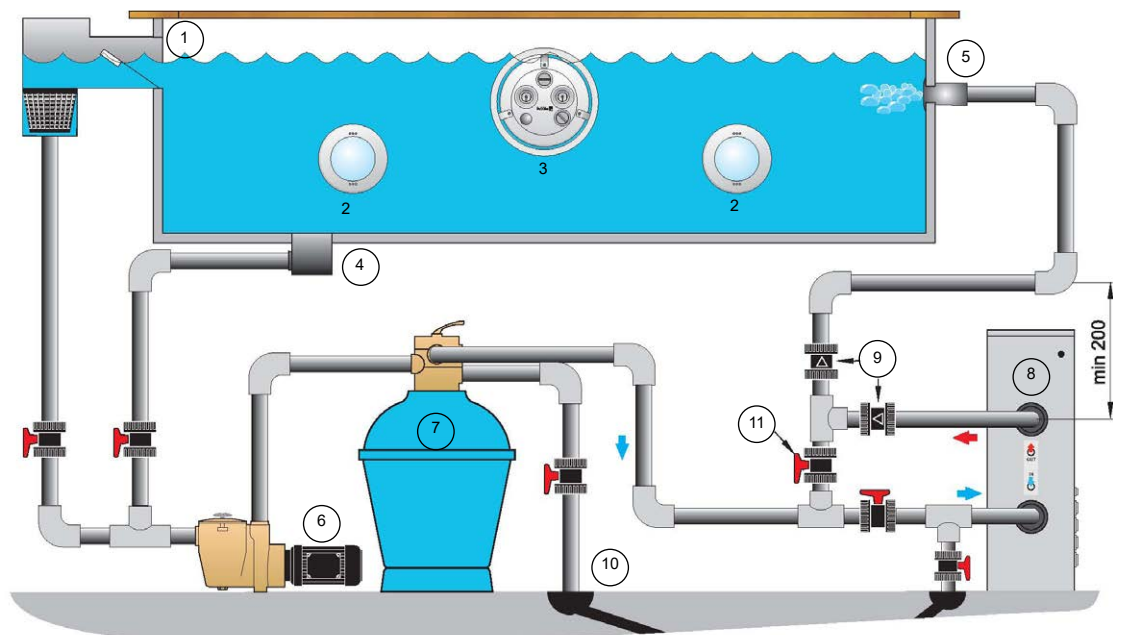
Capacity	Item no.	3~400V	3~415V	Min.flow 170 l/min	Max. flow 300 l/min	Max press. 2 bar
18kW = 2x9kW	1511018T	18kW 26A	19,5kW 27A	•	•	•
24kW = 2x12kW	1511024T	24kW 35A	26kW 36A	•	•	•
30kW = 2x15kW	1511030T	30kW 43A	32kW 45A	•	•	•
36kW = 3x12kW	1511036T	36kW 52A	39kW 54A	•	•	•
45kW = 3x15kW	1511045T	45kW 66A	49kW 69A	•	•	•
60kW = 4x15kW	1511060T	60kW 87A	65kW 90A	•	•	•
72kW = 4x18kW	1511072T	72kW 104A	78kW 108A	•	•	•

### Technical data MidiHeat Analogue EHA 380 - 415V

Capacity	Item no.	3~400V	3~415V	Min.flow 170 l/min	Max. flow 300 l/min	Max press. 2 bar
18kW = 2x9kW	1512018T	18kW 26A	19,5kW 27A	•	•	•
24kW = 2x12kW	1512024T	24kW 35A	26kW 36A	•	•	•
30kW = 2x15kW	1512030T	30kW 43A	32kW 45A	•	•	•
36kW = 3x12kW	1512036T	36kW 52A	39kW 54A	•	•	•
45kW = 3x15kW	1512045T	45kW 66A	49kW 69A	•	•	•
60kW = 4x15kW	1512060T	60kW 87A	65kW 90A	•	•	•
72kW = 4x18kW	1512072T	72kW 104A	78kW 108A	•	•	•

### Installation overview

1. Skimmer
2. Light
3. Jet Swim
4. Main drain
5. Inlet
6. Pump
7. Filter
8. MidiHeat
9. Check valve
10. Drain
11. By-pass valve



# Quick guide for calculation of electric heaters

## Calculation of electric heaters



MidiHeat 18-72 kW



Compact 3-18 kW



Aqua compact 3-18 kW



Aqua HL line 3-15 kW

## Example

The amount of hours in theory it takes to heat up your pool based on volume and the capacity (kw) of the heaters.  
 Example: the pool is 100 m<sup>3</sup> and a heater of 24kW takes 87 hours to heat up to 28°C from 10°C.

		ΔT=18 (10°C - 28°C)										
		kW										
Volume		6	9	12	15	18	24	30	36	45	60	72
25 m <sup>3</sup>		87	58	44	35	29	22	17	15	12	9	7
45 m <sup>3</sup>		157	105	78	63	52	39	31	26	21	16	13
70 m <sup>3</sup>		-	163	122	98	81	61	49	41	33	24	20
100 m <sup>3</sup>		-	-	174	140	116	87	70	58	47	35	29
150 m <sup>3</sup>		-	-	-	-	-	131	105	87	70	52	44
200 m <sup>3</sup>		-	-	-	-	-	-	140	116	93	70	58
250 m <sup>3</sup>		-	-	-	-	-	-	-	145	116	87	73
300 m <sup>3</sup>		-	-	-	-	-	-	-	-	140	105	87
350 m <sup>3</sup>		-	-	-	-	-	-	-	-	-	122	102

## Heat loss and how to avoid them.

When you build a pool it's important to avoid heat losses to keep the energy cost as low as possible.

There are a few things you can think of yourself like:

- Isolate walls and bottom
- Get yourself a pool cover
- Place the pool in a sunny spot

In Sweden as a standard we calculate the heat requirement with 300 W / m<sup>2</sup> pool area\*.

Some parameters to consider:

- Pool area
- Air temperature
- Pool temperature
- Evaporation
- Weather conditions
- Type of pool (wood, steel, concrete a.s.o.)

\* Operation beginning in May to September, well insulated pool with pool cover and a pool temperature of 28°C. For other conditions, please contact your dealer.

## Theoretical heat calculation

Examples of calculation formulas for heating pools without any heat loss

1. Power required to increase water temperature by  $\Delta T$  degrees in a fixed time (t), assuming no heat loss.  
Formula:  $P = 1.16 \times \frac{\Delta T}{t} \times V$
  2. Time taken to increase water temperature by  $\Delta T$  degrees from a fixed power input, assuming no heat loss.  
Formula:  $t = 1.16 \times \frac{\Delta T}{P} \times V$
- P = Power in kW  
 t = Time in hours  
 $\Delta T$  = Temperature difference °C  
 1.16 = Constant  
 V = Volume in m<sup>3</sup>

Example:

Time taken to heat 30 m<sup>3</sup> of water from 5°C to 25°C with a 6 kW heater, assuming no heat loss:

$$t = 1.16 \times \frac{(25-5)}{6} \times 30 = 116 \text{ hours}$$



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