Pahlén®
Premium pool equipment

User manual / تعليمات التركيب

MidiHeat EHD

A45-33AE rev.4
023

It is important to read through this manual carefully in order to ensure the function and useful life of the pool equipment.
This manual can also be found at www.pahlen.com .
Pahlén AB is not responsible for product warranties or for damages that occur as a result of faulty installation, improper use or poor maintenance.

MidiHeat EHD

Model name	Item no.
MidiHeat EHD180T	1511018T
MidiHeat EHD240T	1511024T
MidiHeat EHD300T	1511030T
MidiHeat EHD360T	1511036T
MidiHeat EHD450T	1511045T
MidiHeat EHD600T	1511060T
MidiHeat EHD720T	1511072T

All heaters are produced by Pahlén AB in Upplands Väsby, Sweden.

من المهم قراءة هذا الدليل بعناية لضمان عمل جهاز حوض السباحة وعمره الافتراضي. يمكن العثور على هذا الدليل أيضًا على الموقع www.pahlen.com
لا تتحمل شركة بالين آ بي مسؤولية ضمانات المنتج أو الأضرار التي تكون نتيجة لحدوث خلل في التركيب أو الاستخدام غير الصحيح أو الصيانة السيئة.

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يتم إنتاج جميع السخانات بواسطة مصنع pahlén AB في بلدية Upplands Väsby، السويد.

Product description

Pahlén's Midi Heat EHD is a compact electric heater for swimming pools. It is equipped with a digital thermostat that controls the pool water temperature (max + 45ºC). Its metal chassis plate includes water container made of glass-fiber reinforced polypropylene with efficient and corrosion-proof heating elements of titanium.

The electric heater is in effect from 18–72kW for 400V (380–415V 3-phase). Check rating plate on the back of the heater for the applicable data.

Several Midi Heat Digital electric heaters can be connected in parallel (2-10 devices) and controlled by the (Master) electric heater instead of adjusting individual temperature settings for every one of them.

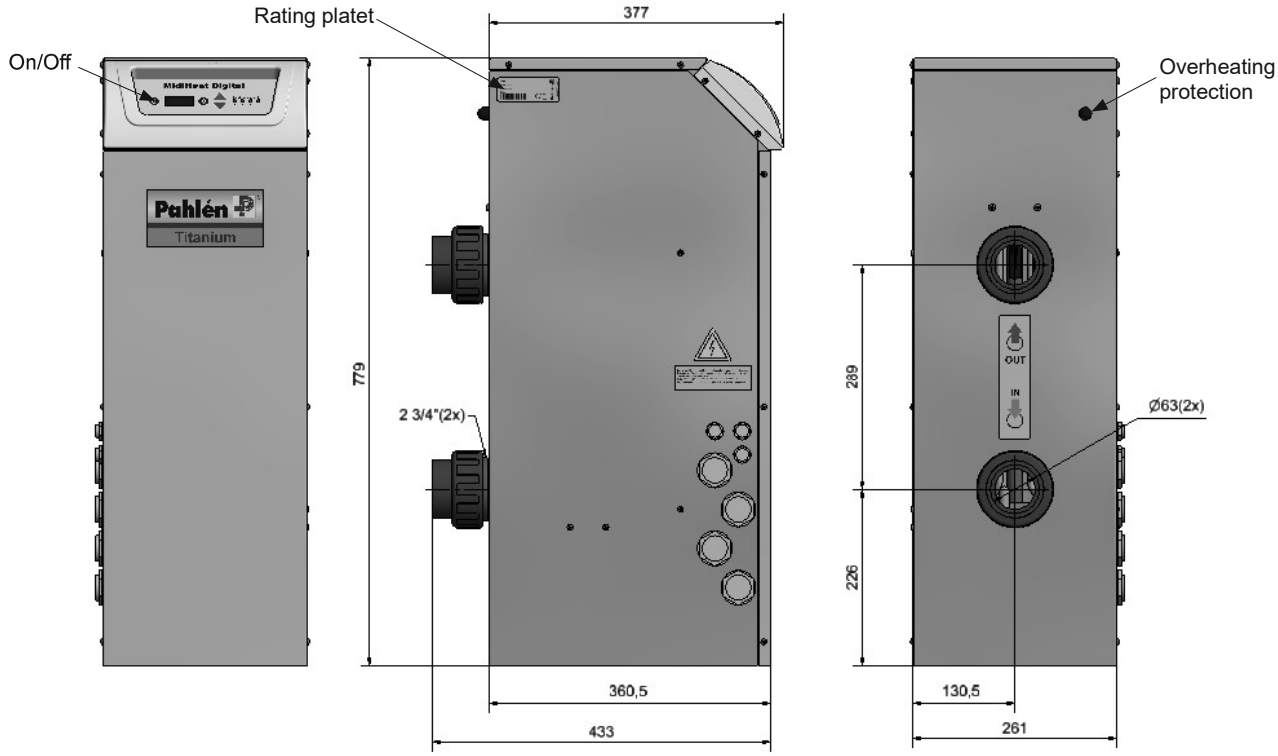


Fig. 1

⚠ WARNING

- This device must not be used to heat drinking water.
- This apparatus must not be used in aggressive water, salt water or pools/hot tubs with chlorine machines/salt chlorinators, see the recommended values regarding the water quality.
- The water inlet on this device must not be connected to the water from any other water heating system.
- The heater must be installed in accordance with the applicable national legal statutes and directives, and the electrical installation must only be performed by a qualified electrician.
- Do not begin the installation of the product before you have read and understood the installation instructions and warnings in this manual. If you have any questions about the installation instructions or warnings, contact your local retailer.
- Under no circumstances may this device be started before it is completely filled with water.
- This device must not be covered, placed in the vicinity of inflammable material or in direct sunshine.
- This device must not be used by very small children (0-3 years old).
- This device must not be used by small children (3-8 years old) and persons with highly comprehensive and complex functional disabilities unless they are constantly supervised by a person responsible for their safety.
- This device may be used by children over 8 years of age, and by persons with impaired physical, sensory or mental capacity or with a lack of experience or knowledge, provided they have received guidance on how to use the device safely and that they have been made to understand the risks that may occur by a person responsible for their safety.
- Children may not play with the device.
- This device must not be cleaned or maintained by children without supervision.
- If the installation instructions are not followed, the product guarantee is null and void.

Technical data

Max. load	2 bar (0.2 MPa)
Max. flow	300 l/min
Min. flow	170 l/min
Ambient temperature	+5ºC till +40ºC

General information

Follow these instructions concerning water quality:

Free chlorine:	0.5–1.5 mg/liter (ppm)
Combined chlorine:	0–0.5 mg/liter (ppm)
Total chlorine:	0.5–2.0 mg/liter (ppm)
Chloride (salt) content:	—
pH-value:	7.2–7.6
Alkalinity:	60–120 mg/liter (ppm)
Calcium hardness:	100–300 mg/liter (ppm)

Installation

Piping must be performed before wiring.

Place the heater so that the front and top parts can be opened. Install connectors so that the heater can be easily moved for inspection, cleaning and servicing

A check valve should be installed AFTER the heater and a shutoff valve BEFORE the heater, so that servicing of the heater can be performed without emptying the swimming pool.

A bypass connection should be installed and adjusted so that the recommended flow through the heater can be achieved.
If several (2-10) MidiHeat devices are connected in parallel, each Midi Heat should have its own by-pass connection for easy servicing.

Fix the heater on a flat horizontal floor/foundation with a screw/bolt through four Ø9 mm holes in the bottom.

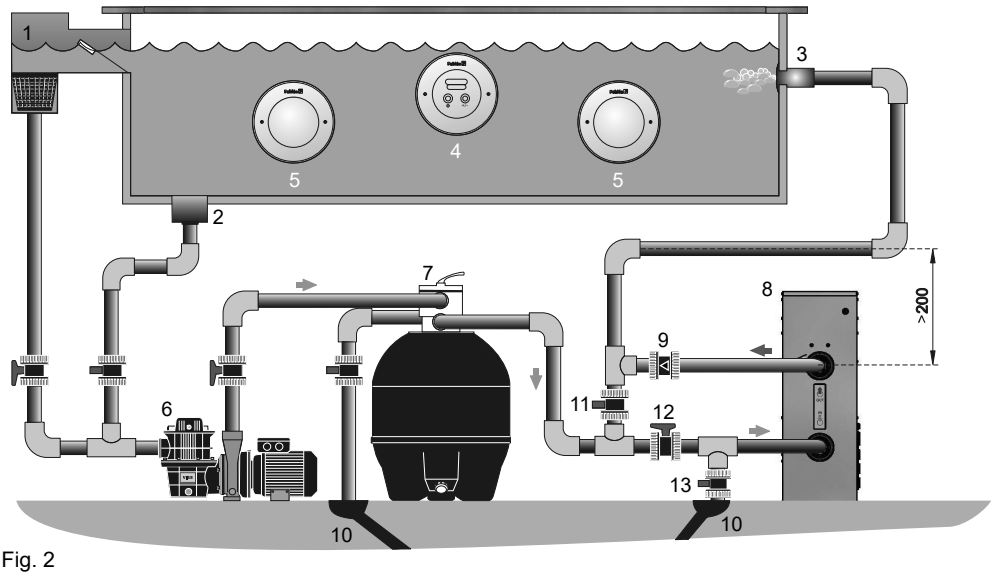
Piping layout

Plug the heater into the pool system according to the flowchart below. The outlet may not be connected to any type of crane or connections other

than those stated here.

The heater is equipped with connections G2¾" for binding PVC pipes with outside diameter Ø63 mm.

Note! Do not install a shutoff valve between the heater and the swimming pool (install check valve instead). Dosing of chlorine, acid or similar must always be done AFTER the heater.



1. Skimmer
2. Main drain
3. Inlet
4. JetSwim
5. Light
6. Pump
7. Filter
8. MidiHeat
9. Check valve
10. Drain outlet
11. Valve - bypass
12. Valve - suspension

Fig. 2

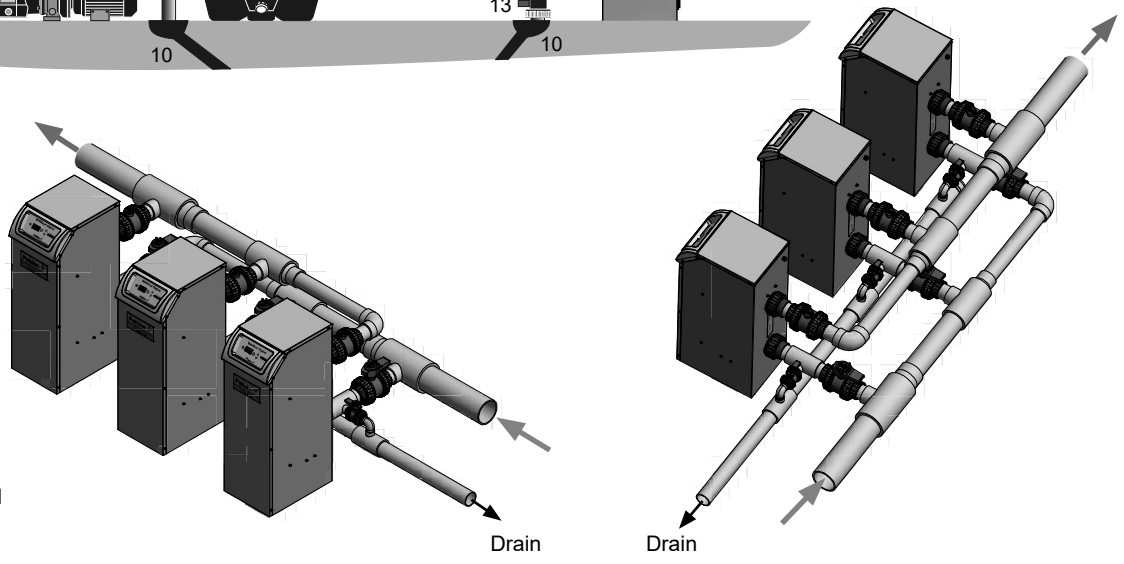


Fig. 3.
Example of several
Midi Heat devices

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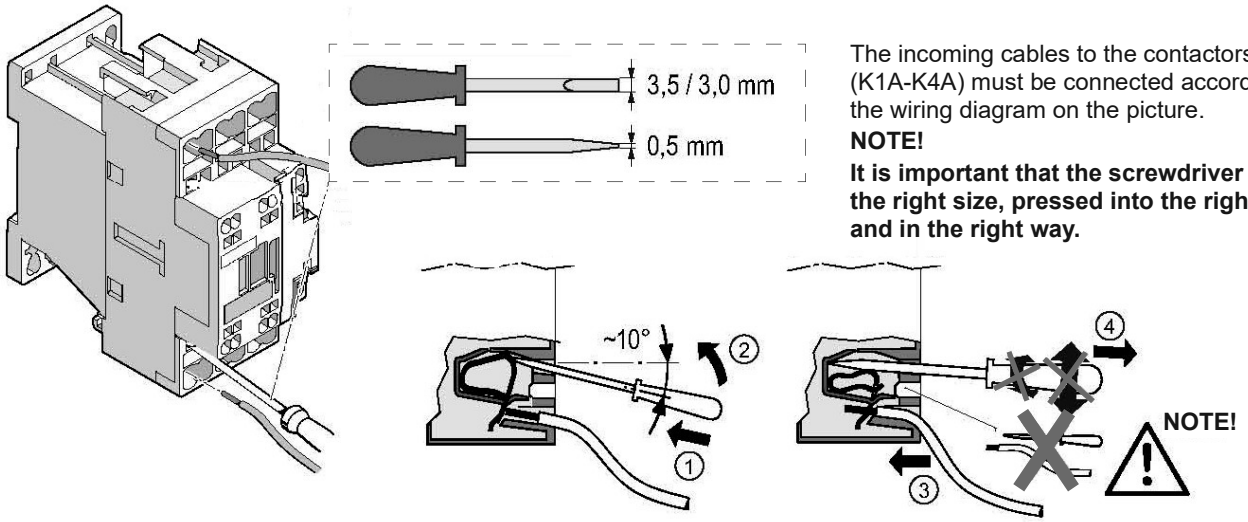
Electric installations

- Electric installations must be performed by a qualified electrician according to the instructions supplied with the heater.
- Main switch should be installed before the heater, same as all the following electric connections L1, L2 and L3 (all pole switches complying with IEC/EN 60335-1 par. 7.12.2, 22.2, 24.3.)
- Pahlén recommends to install circuit breakers.
- Connect the heater according to the wiring diagram, see page 14.
- The control voltage is connected to terminals L1 and N.
  Note that the control voltage must be fitted with a separate fuse (F5) at 5–10 Amperes for electric connections (L1, L2).
- If a motor protection auxiliary relay for the pool circulation pump is available, it must be connected to terminals P1 and P2, see attached wiring diagram for the voltages and number of phases. When motor protection is switched on, the circuit should be closed, potential-free changeover contact.
- Do not connect the heater to a faulty power supply. Contact your local power company for correct power supply. Voltage to the heater must not vary by more than + 5% to –10% according to the model and nameplate specification.
- Incoming cables to the control circuit must always be secured at 5–10A.
- Incoming cables to the contactors must be secured under the table for the current operating voltage, check the product nameplate and see the respective wiring diagram and table (Fig. 5).
- At 2-10 devices connected in parallel, they can all be controlled from an electric heater instead of individual temperature adjustment for all other electric heaters. Connections are made by means of a 2-wire communication cable (min. 0.25mm²) on terminal J4, between each circuit boards of the electrical heaters (daisy chain).



The incoming cables to the contactors (K1A-K4A) must be connected according to the wiring diagram on the picture.

NOTE!

It is important that the screwdriver is of the right size, pressed into the right hole and in the right way.

Fig. 4

The electric heater is factory wired for 400V 3-phase, see table below + wiring diagram on page 14.

3~ 380–415V

Effect	Fuse F1-4	Min. cable area*	Heating element connected for 380-415V 3-phase
2x9 = 18kW	20A	2,5 mm²	
2x12 = 24kW	25A	4 mm²	
2x15 = 30kW	32A	6 mm²	
3x12 = 36kW	25A	4 mm²	
3x15 = 45kW	32A	6 mm²	
4x15 = 60kW	32A	6 mm²	
4x18 = 72kW	32A	6 mm²	

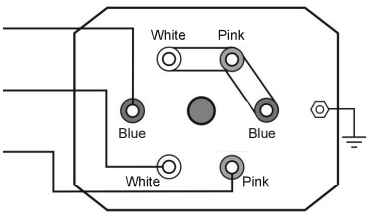
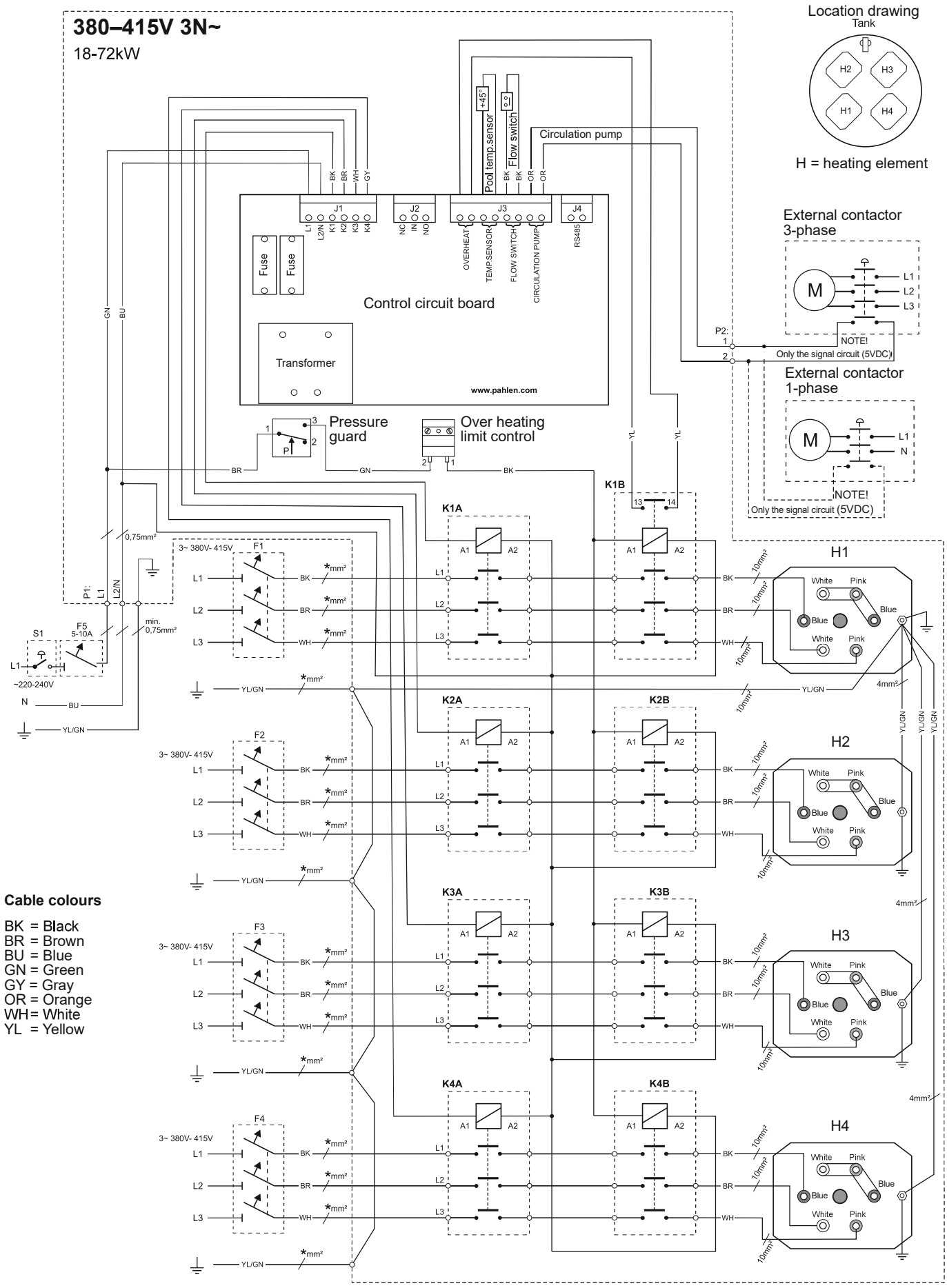


Fig. 5



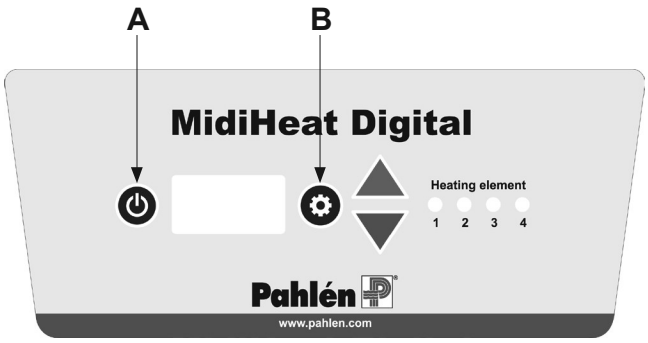
Cable colours

BK = Black
BR = Brown
BU = Blue
GN = Green
GY = Gray
OR = Orange
WH = White
YL = Yellow

Startup

Start

1. Check electric connections and piping. Turn on all external fuses and circuit breakers.
2. Open all valves to and from MidiHeat (except drainage) and fill the system with water.
   - If the pool water level is lower than the heater, fill the pool with the heater switched off.
   - If the system has a bypass switch, open the by-pass valve halfway (make final adjustments later).
3. Start the pump in order to fill the system with water
4. When the system is filled with water and all air is gone, switch on the heater.



Temperature adjustment

Midi Heat is factory set at 28°C upon delivery.

The electric heater remembers the last set of desired temperatures in the event of power failure.

Set/change the required temperature:

1. Press the standby button (A) on the panel.
2. Set the desired pool temperature (°C) by pressing blue or red arrow. Red = temp. up, blue = temp. down.
3. “Heating elements” diodes on the panel indicate that the cartridges are being switched. The cartridges are sequentially activated with a delay. When the desired pool temperature is reached, the el. Cartridges are closed sequentially.
4. Check the pool temperature for some time and adjust if necessary any temperature offset (may be due to energy losses in the system), see “System Settings”.

Water/Bypass adjustment

Water flow can be adjusted using an external valve in by-pass connection.

Adjust bypass valve so that the flow through the electric heater is between 170–300 l/min. In order to prevent the unauthorized handling, operational problems or damage to the electrical heater, it is recommended that the handle of the bypass valve is removed after the adjustment is made.

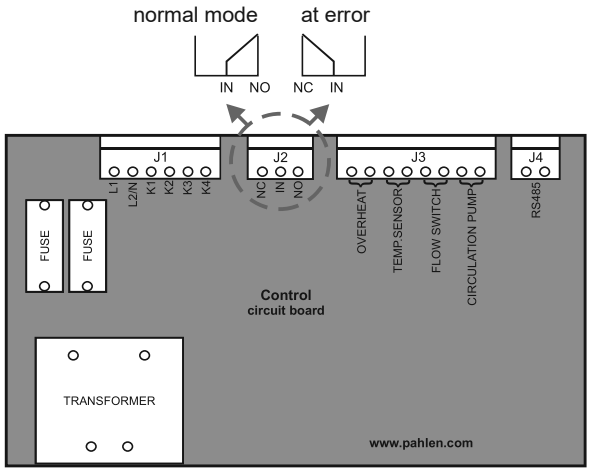
At low flow in the pool circulation, the electric heater will break the warming and display error code E1. When the correct flow has been achieved, the electrical heater restarts with a time delay of approximately 20 seconds.

Alarm output

The electric heater has built-in alarm output J2. The relay output is a potential-free changeover contact and is active at fault codes and blackouts.

In the master/slave control system the alarm signal is picked only from the master.

Maximum load: 8A at 250VAC
5A at 30VDC

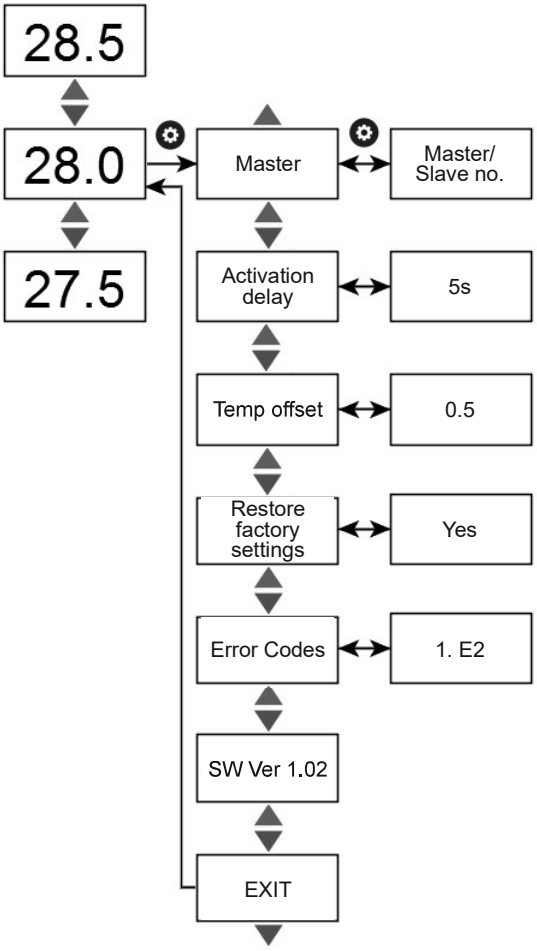


System configuration

Mode button (B) provides access to system settings and will be shown on display as [Mode]. DOWN arrow allows access and making changes to the general system parameters.

Mode button provides access to the resp. parameter changes by means of arrow keys. Changes to the system parameters are saved with the Mode button.

Return to the start menu is automatic after 5 seconds, or when selecting [Exit] in the display + Mode button.



When you interconnect 2-10 MidiHeat devices, you decide which will be the Master and the others are Slave 1, Slave 2... etc.

Time delay is factory set at 5 seconds. Can be changed to between 5-60 seconds.

Allows, if necessary, to add a compensation value for the poss. temperature loss in the system, so that the display shows the actual temperature of the pool water.

Yes/No. Yes = Restores factory defaults and removes stored error codes, No = lets to abandon them.

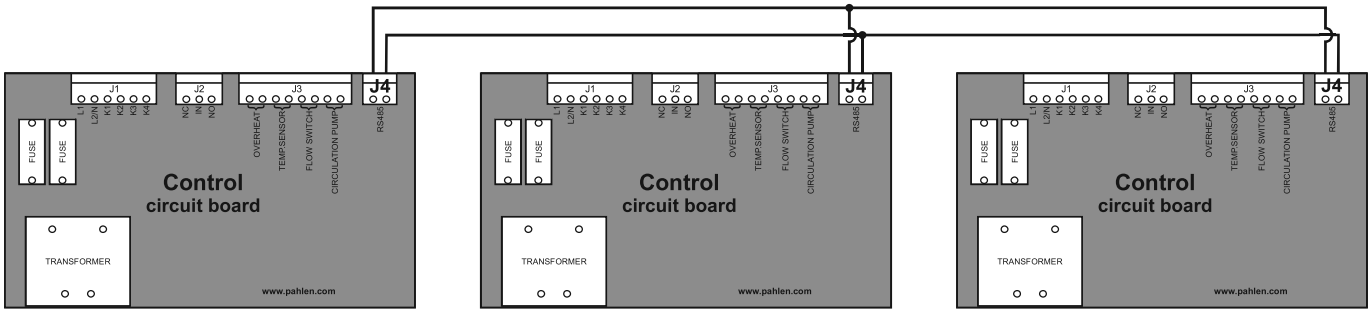
The last 20 error codes are stored, where 1 is the most recent.

Master/slave-control

Several Midi Heat Digital devices can be connected in parallel (2–0 devices) and controlled from a (Master) electric heater instead of adjusting individual temperature settings for every one of them.

The electric heaters connected to a shielded, paired 2-wire cable 0,25–2,5mm^2. The part of the signal cable that is on the outside of two electric heaters should not be longer than 2 m.

When you have [Mode] on the display, press again the MODE button for addressing a device master (the one who decides) and other devices as slaves (following the master). Note that you can not configure more than 1st master, only slaves or slaves with the same address number (leading to communication error).



Master Slave 1 Slave 2

Maintenance

Note that the electric heater is working only when water circulates in the system. It will not be heated if the circulation pump is switched off or if the desired pool temperature has been reached.

If the electric heater does not heat the pool water for a long period it is recommended to turn off all main power switches.

If the water in the system is still for more than a week, the electrical heater must be emptied of water.

At the risk of freezing, the power to the electric heater and the pump should be turned off and both the electric heater drained of water, see “Draining the electric heater” below.

When backwashing and cleaning the pool system filter, the electric heater must be turned off.

In areas with hard water, the electrical heater cartridges have a lime coating that reduces the electric heater power and the cartridges service life Contact an authorized electrician in order to inspect the immersion heaters of the tank periodically and remove this coating when necessary.

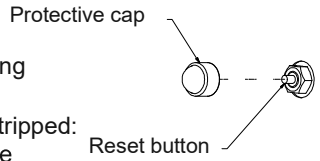
Draining the electric heater

1. Turn off the electric heater and turn off all main power before draining.
2. Close shut off valve (pos.12, fig. 2).
3. Open shut off valve (pos.13, fig. 2).
4. Disconnect the electric heater outlet connection (marked with red arrow) a little to let air in. The electric heater holds around 15 liters of water. Take care that all water comes out.
5. Tighten the electric heater outlet connection when the electric heater is completely empty.
6. Let drain valve stay open (water from the rest of the system may remain).

In case of any error

The display shows an error code, see below. Contact your installer to fix the error.

Error codes

Code	Cause	Action
E1	Flow switch indicates low flow	Check/increase water flow
E2	Pool water temp. sensor is not connected, or is shorted/broken	Check that the temp sensor is connected. Replace the broken temp. sensor.
E6	The overheating protection has tripped	Warning! The unit is energized until the first contactor although overheating protection has been triggered. Reactivate thermal protection manually by removing the small protective cap and pressing the reset button. If the overheating protection continues to be tripped: contact your installer or other qualified service technician. 
E10	Circulation pump is inactive	Turn on the circulation pump.
E12	Communication error	Check settings for Master/Slave communications. Check the communication cable
HC	For high temperature on the circuit board	Check that the ambient temperature is not higher than 40°C.
HP	Water temperature is higher than 45°C	Check that other heat sources are not enabled

In Master/slave control system, an error code and a number in parenthesis will be seen. It indicates which of the connected devices have actually failed.

Example: E1 (2) = indicates that Slave unit 2 has an error

A reservation for possible misprints. The right to change technical specifications and assortment is reserved.
Color deviations may occur due to technical reasons.

EC Declaration of Conformity

In accordance with EN ISO 17050-1:2010
The following products have been tested by us and found in compliance with the Low Voltage Directive (LVD) 2014/35/EU, the Electro Magnetic Compatibility (EMC) Directive 2014/30/EU and the RoHS Directive (EU) 2017/2102

Applicant:	**Pahlén AB** **Box 728, SE-194 27 Upplands Väsby, Sweden**
VAT No.:	**SE556301230001**
Product:	**MidiHeat EHA*T, MidiHeat EHD*T**

Sample of the products have been tested with applicable parts of the following standards:

Safety:	**EN 60335-1:2012+AC:2014+A11:2014+A13:2017** **+A1:2019+a14:2019+A2:2019** **EN 60335-2-35:2016+A1:2019** **IEC 60335-1:2010, /AMD1:2013, /AMD2:2016** **IEC 60335-2-35:2012, /AMD1:2016**
EMC:	**EN 55014-1:2017, EN 55014-2:2015** **EN 61000-3-11:2000, EN 61000-3-12:2011** **EN 61000-6-1:2007, EN 61000-6-3:2007+A1:2011**
EMF:	**EN 62233:2008**
Sealing class:	**IP44**

Certification
Performed by: Nemko

CB certificate no.: NO110614, NO110615

CE

Pierre Zuber, Quality Manager
Upplands Väsby, 2020-03-12

This declaration of conformity is issued under the sole responsibility of the manufacturer and is based on the testing of one sample of the above product. Pahlén AB ensures that all products in the series production are in conformity with the tested sample. The technical file and all referenced test reports are available at Pahlén AB.