

Pahlén ®
swimming pool equipment

Swedish design
and manufacture
since 1967



MiniMaster

User manual



Product description

MiniMaster is an electronic unit for checking and controlling the pH and/or chlorine level in a pool. The pH value is measured with a pH electrode and the chlorine level is measured with a free chlorine electrode. MiniMaster can be linked with dosing equipment for acid/base (pH) and chlorine. The package contains: 1 control unit, 1 5-metre hose, 2 ball valves, 2 hose couplings. Electrodes are delivered separately.

Technical data

| | MiniMaster pH/chlorine | MiniMaster chlorine | MiniMaster pH |
|---|------------------------|---------------------|---------------|
| Power consumption – excl. dosing equipment | 4W | 2W | 2W |
| Power consumption – dosing equipment (max.) | 2x100W | 100W | 100W |
| Rated current | 1 A | | |
| Voltage | 220–240V 1~N 50/60 Hz | | |
| Temperature range | 0 to +45°C | | |
| Ingress Protection code | IP44 | | |
| Dimensions LxWxH | 310x84x500 mm | | |
| Weight | 2 kg | | |

General info

Dosing of chlorine, acid or the like must be done after all other equipment to minimize corrosion. MiniMaster must be mounted on a wall or similar and must sit straight.

Recommended pool water values:

Chlorine content: 0.5–1.5 mg/l (ppm)
 pH value: 7.2–7.6
 Alkalinity: 60–120 mg/l (ppm)
 Chloride (salt) content: max 10 g/l (1%)
 Calcium hardness: 200–1000 mg/l (ppm)

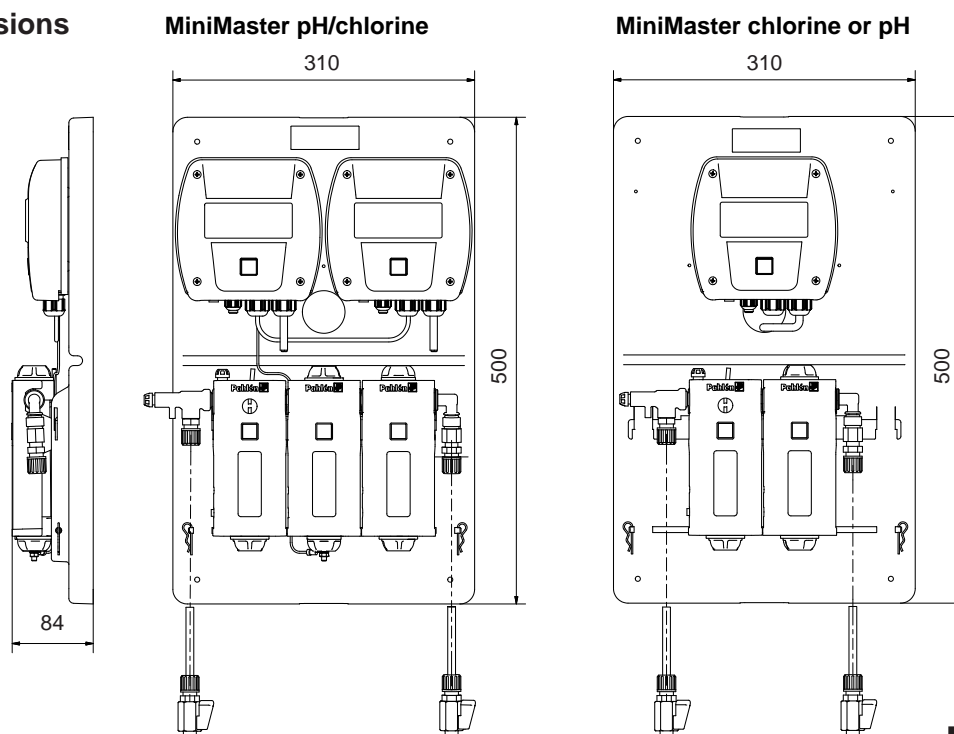
For more details on pool chemistry and care, refer to the pool user's guide on our website <http://www.pahlen.com/users-guide/>

Safety

MiniMaster must be connected so that it is in direct contact with the terminal box of the pump motor.

This, to ensure reliable measurements and to prevent against unintended dosing when circulation pump is deactivated.

Dimensions

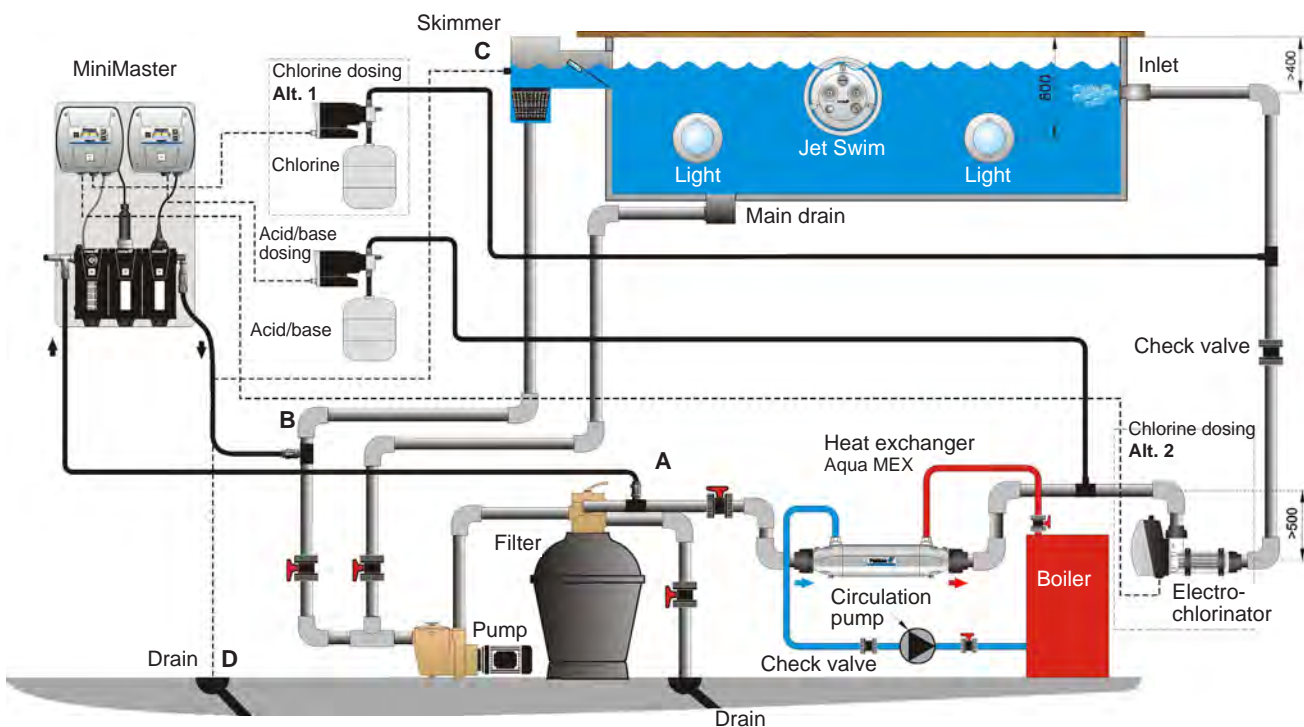


Installation, pipes

The following is required: Ø11.8 drill bit, 1/4" screw tap, thread sealer.

A 5-metre hose is included. This should be sufficient for both inlet and outlet.

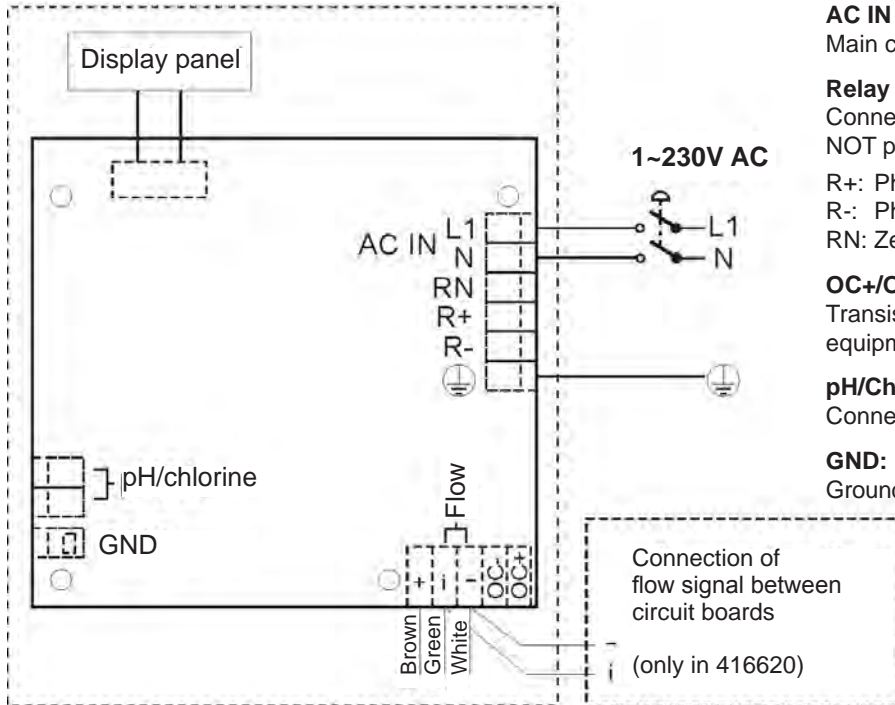
1. Flow cell inlet (A): Drill a hole in the pipe after the pump outlet. Thread the hole.
2. Flow cell outlet (B): Drill a hole in the pipe from the skimmer. Thread the hole.
Alternative position for outlet (C): Route the hose directly down into the skimmer.
Alternative position for outlet (D): Route the hose directly down into the drain.
3. Mount supplied connections: Undo the lock arm, lower the modules forward, screw the connection with a drain tap onto the filter module. Use thread sealer (or glue) in the holes on the pipes when fitting the couplings (K).
4. Cut the supplied hose to suitable lengths.
5. Fit the supplied hose coupling in one end of the hose and connect it to the flow cell.
6. Fit the supplied hose coupling in the other of the hose and connect it to the couplings on the pipes.



Installation, electrics

Electrical installation must always be carried out by an authorized electrician.

Pipe installation must be complete before electrical installation is started. For fixed installation, a switch is recommended before the unit. Connect the power cable, electrodes and any dosing equipment as indicated in the diagram below.



AC IN

Main current connection to the unit.

Relay connection

Connection of dosing equipment, 230 VAC, NOT potential free.

R+: Phase (for dosing chlorine and pH-elevating agent).

R-: Phase (for dosing pH-reducing agent).

RN: Zero/Neutral (common for dosing).

OC+/OC-:

Transistor "open collector" output for dosing equipment, 5 V.

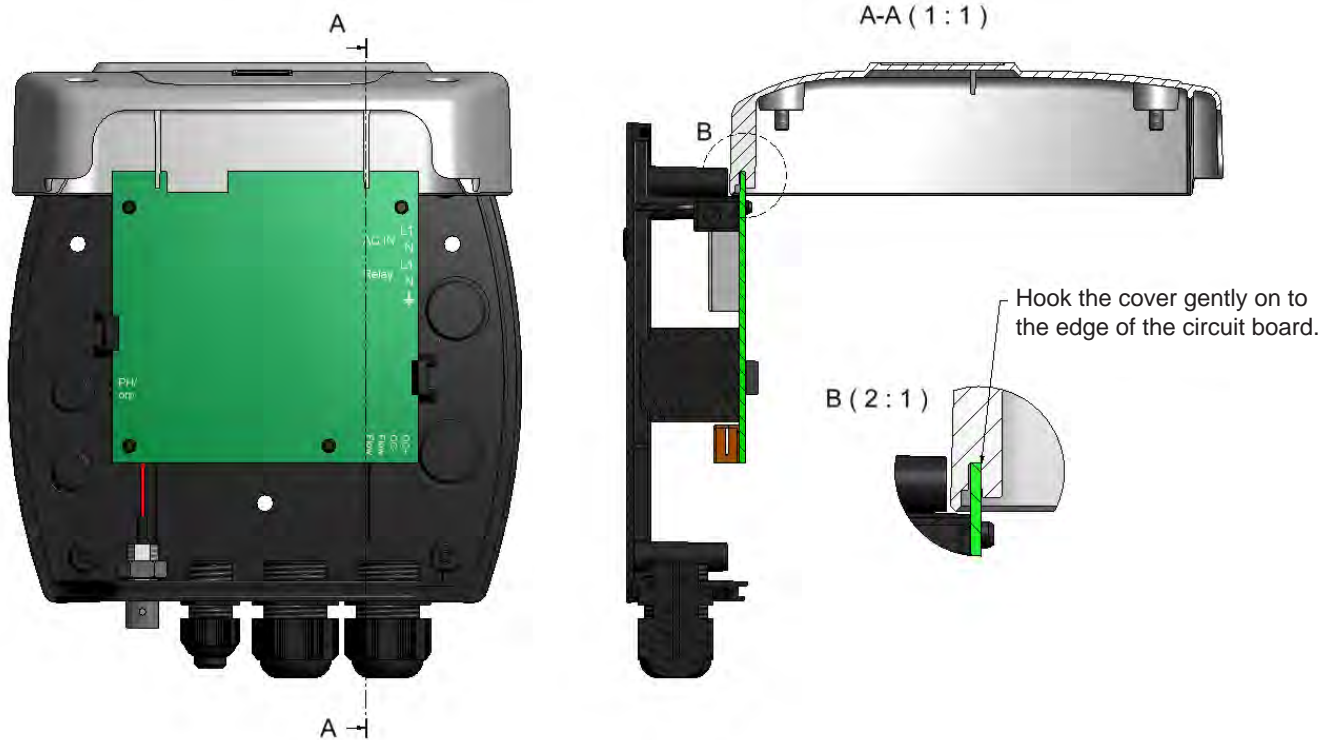
pH/Chlorine:

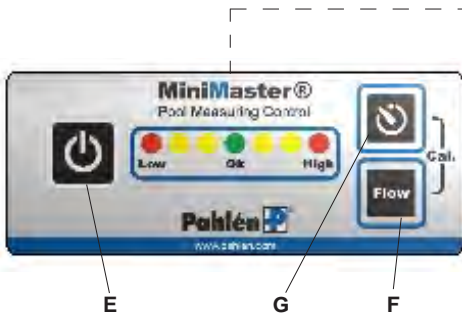
Connector for electrode connection.

GND:

Ground socket connection (chlorine measurement only).

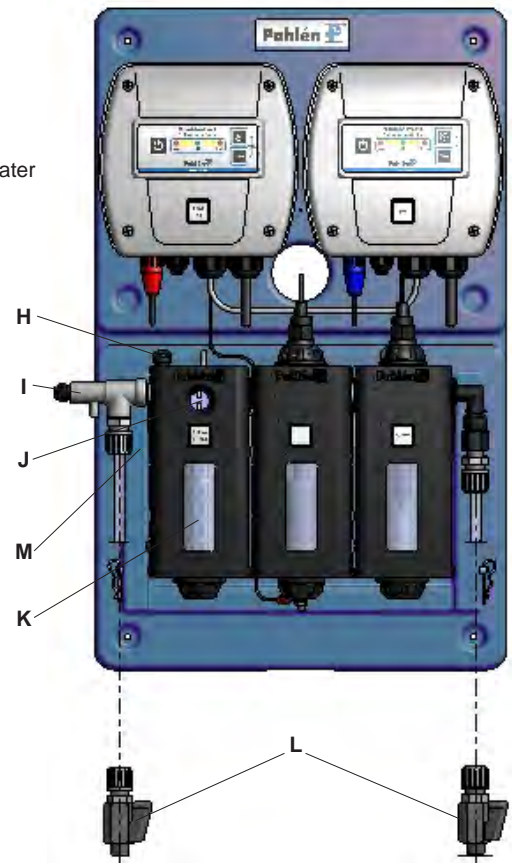
The cover of the control unit can easily be hooked in place in open position to simplify installation.





- E Dosing On/Off
- F Flow
- F+G Calibration
- G Forced dosing

- H Flow adjustment
- I Drain tap, measurement water
- J Flow meter/impeller
- K Filter cartridge
- L Ball valve
- M Lock arm



Start

The circulation pump must be running in order for the unit to give correct values.

1. Switch on MiniMaster.
2. Press the Flow button (F) (only required on the left-hand unit when there are two).
3. Adjust the flow with the flow screw (H) until the green LED lights up. You can see in the window (J) that there is flow through the unit.
4. Take measurement water from the drain tap (I) and check the pH value of the pool. Use reference fluid pH 7.3 or measure with photometric measuring equipment.
Balance the pH value by adding acid/alkaline agent directly into the pool manually until a pH reading of 7.2 - 7.4 has been reached.
5. Then dose chlorine to the desired level (recommended value 0.5–1.5 mg/l):
- either manually direction in the pool or
- use the forced dosing function – hold button (G) depressed for 3 seconds. Chlorine dosing then runs for 2 minutes. Repeat if necessary.
6. Check the value with photometric measuring equipment.
7. Then calibrate the unit as described below.

Calibration

Each unit is calibrated separately. They are independent of each other.

1. Calibrate the unit by pressing and holding the two calibration buttons (F+G) at the same time. The LED flashes quickly (approx. 5 times per second) to confirm that calibration is in progress.
2. The flashing slows down once calibration is complete. You can then release the buttons.
3. The calibrated value is saved in the unit memory. The green LED in the centre now represents this value, lights up and remains lit.
If calibration fails, it is often due to an implausible value (the previous value is then retained). Recalibration is then required.
4. Once calibration is complete, dosing is activated by pressing the ON/OFF button (E) on the control unit. If there are two control units, this must be done on both units.

Operation

The measured value in the pool is indicated symbolically on the display with the seven LEDs. When the unit is active, one of the LEDs flashes. The table below indicates the values represented by the different colours.

| LED → | Red Low | Yellow | Yellow | Green OK | Yellow | Yellow | Red High |
|---------------|---------|---------|---------|------------------------------------|---------|---------|----------|
| ↓ Model | | | | | | | |
| pH | < 6.8 | 6.8–7.0 | 7.0–7.2 | Calibration value (rec. 7.2–7.4) | 7.4–7.6 | 7.6–7.8 | >7.8 |
| Free chlorine | < -80% | -60% | -30% | Calibration value (rec. 0.5–1 ppm) | +30% | +60% | >+80% |
| Flow L/h | <10 | 11–18 | 18–26 | 27–52 | 53–72 | 72–100 | >100 |

During alkali dosing, one of the LEDs to the left of the green one lights up.
During acid dosing, one of the LEDs to the right of the green one lights up.
During chlorine dosing, one of the LEDs to the left of the green one lights up.

If there is a temporary need for increased dosage, use the Forced dosage function:

- Press the button (G) for 3 seconds. Dosage will take place continually for 2 minutes (chlorine) or 30 seconds (pH).
 - If necessary, repeat again until estimated value is reached.
- To stop ongoing forced dosage in advance, press button (E).

| Type of LED signal | Meaning |
|--|---|
| The two red LEDs are lit with a steady glow: | The unit is not calibrated. Dosing is not possible. |
| The two red LEDs flash alternately: | Flow too high or too low. Dosing is deactivated. |
| All red and yellow LEDs flash simultaneously: | Continuous dosing has been activated >90 min. Dosing deactivated. For restart: see troubleshooting. |
| Flashing LED – lit long time and unlit short time: | Dosing is activated. Measurement is in progress. |
| Flashing LED – lit short time and unlit long time: | Dosing is not activated, but measurement is in progress. |
| Rolling LEDs | Forced dosing is in progress. |

Care

Reference measurement of chlorine and pH should be performed 1–2 times per month with subsequent calibration.

If there is a risk of freezing, the modules must be emptied of all water and the electrodes must be removed and stored frost-free standing in water.

The plug threads and O-rings should be lubricated at least once per year with silicone grease with PTFE (non-petroleum-based grease).

The electrodes must be cleaned regularly (see instruction MA60-06: *Electrodes, handling and care*), at least once a month for a fresh water pool and every other week for a salt water pool.

1. Switch off dosing (On/Off button E).
2. Cut off the flow of water by closing the ball valves (L).
3. Lift up the lock arm (M) and lower the modules forward.
3. Unscrew the electrode and lift it upwards.
4. Clean, rinse and refit.

The filter (K) must be checked each week. Replace the filter when necessary.

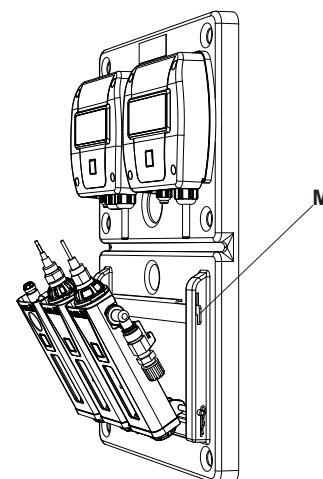
1. Switch off dosing (On/Off button E).
2. Cut off the flow of water by closing the ball valves (L).
3. Unscrew the bottom plug from the start module (the left-hand one) which houses the filter.
3. Replace the filter or rinse it clean with regular water. A soft brush can be used if necessary.
4. To replace the filter, pull the filter out of the bottom plug and insert a new filter.

NOTE: The filter opening must face upwards.

5. Screw the bottom plug back into the module by hand.

Adjuster screws (H + I) are cleaned as necessary so they do not seize due to being coated.

1. Switch off dosing (On/Off button E).
2. Cut off the flow with the ball valves (L).
2. Screw out the adjuster screw, rinse it and wipe it off.
3. Lubricate the O-ring and plug thread with a little grease.



Troubleshooting

| Fault type | Action |
|---|---|
| If the unit does not start: | <ol style="list-style-type: none"> 1. Check the fuses. 2. If the pump (connected in series with the unit) is off, dosing does not start. |
| If flow suddenly drops: | Clean the filter. |
| If calibration fails: | It is likely due to an implausible value. Recalibrate. |
| Dosing deactivated: (due to continuous dosing >90 min) | <ol style="list-style-type: none"> 1. Check that there is no leakage on dosing tubes and pumps. 2. <i>If the facility has a salt chlorinator:</i> Check that the salt chlorinator has not been deactivated, that it is correctly calibrated and that the signal cable between the salt chlorinator and the MiniMaster is properly connected. 3. To reset after time out: Switch off dosing (On/Off button E), wait a few seconds, start dosing by pushing On/Off button again (E). |

Reservation

We reserve the right to correct any printing errors. We also reserve the right to make changes to technical specifications for MiniMaster or its manual without prior notice.

Colour deviations may occur due to technical reasons related to printing.