ZODIAC®

TRi module PH

TRi module PRO

Instructions for installation and use
English

EN

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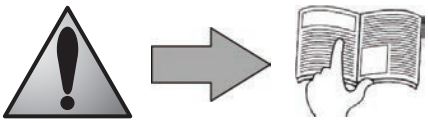

H0412500.A - 2013/08

- Read these instructions carefully before undertaking installation, maintenance or repair of this equipment!
- The  symbol identifies important information that must be acted upon to avoid any risk of harming someone or damaging the equipment.
- The  symbol identifies helpful information, for information only.

Warnings

- **We are constantly improving our products and they may be modified without prior notice.**
- **This centralized control system is exclusively for swimming pools (and must not be used for other purposes).**
- **The equipment should be installed by a qualified technician, following the manufacturer's instructions and according to current local regulations. The user is responsible for installation of the equipment and for compliance with local regulations covering the installation. Under no circumstances shall the manufacturer be held liable if current local installation regulations are not followed.**

- **It is important that this equipment is operated by competent and qualified (both physically and mentally) people that have previously received the instructions for use (by reading this booklet). Any person not meeting these criteria should not go near the equipment, to avoid the risk of being exposed to dangerous components.**
- **If the equipment malfunctions: do not attempt to repair the equipment yourself – contact your installer.**
- **Before working on the equipment, ensure that it and any other equipment connected to it are disconnected from the electricity supply.**
- **Before connecting it to the electricity supply, check that the voltage marked on the equipment matches the mains supply voltage.**
- **Removing or bypassing one of the safety devices automatically voids the guarantee, as does fitting replacement parts not manufactured by us.**
- **Incorrect installation can result in damaged equipment or serious physical injury (or even death).**
- **Keep the equipment out of the reach of children.**
- **The TRi pH or TRi PRO module is only designed to use pH minus (special liquid for use in swimming pools). Use of other products automatically voids the guarantee.**

Contents

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1. Information before installation

1.1 General delivery conditions

All equipment, even carriage and packaging paid, is shipped at the recipient's risk. If damaged caused during transport is observed, the recipient should write appropriate comments on the delivery note provided by the carrier (and confirmed in writing to the carrier by registered letter).

1.2 Contents

1.2.1 TRi pH module

			
TRi pH module	POD	pH sensor	Buffer solution pH 7.5
			
Accessory bag (counterweight + securing clip, PTFE tape and stoppers)		suction + injection hose (5 meters)	Hole saw, 22 mm

1.2.2 TRi PRO module

				
TRi PRO module	POD	pH sensor	ACL sensor	Hole saw, 22 mm
				
Accessory bag (counterweight + securing clip, PTFE tape and stoppers)		suction + injection hose (5 meters)	Buffer solution pH 7.5	Buffer solution 700 mV

1.3 Technical specifications

	TRi pH module	TRi PRO module
Supply voltage	Low voltage (connected to the TRi chlorinator)	
Peristaltic pump flow rate	1.8 L/h	
Maximum back pressure (injection)	1.5 bar	
pH and ACL sensor type	combined, ABS 1/2'' NPT threaded body (pH = blue / ACL = red)	
pH and ACL sensor electrolyte	KCl polymer	
pH and ACL sensor cable(s)	1.5 meters armored, BNC plug (pH = blue / ACL = red)	
pH correction	acid (pH minus only)	

	TRi pH module	TRi PRO module
pH minus dosage	Proportional cyclic	
pH sensor tolerances	Flow speed 2 metres/second - 5 bar / 60°C	
Measurement scale & pH sensor accuracy	pH 0.0 to pH 12.0, ± 0.1 pH	
pH sensor calibration	1 point, pH 7.5	
ACL sensor tolerances	/	Flow speed 2 metres/second - 5 bar / 60°C
Measurement scale & ACL sensor accuracy	/	100 mV to 1000 mV / ± 10 mV
ACL sensor calibration	/	1 point, 700 mV
pH and ACL sensor response time	< 15 seconds	
Dimensions (w x h x d)	28.5 x 15.5 x 7.5 cm	
Weight (module only)	1 kg	
Protection index	IP23	

2. Installation

2.1 Preparing the pool: water balance

The TRi is designed to disinfect the water in the pool by means of its salt chlorination function.
With the TRi pH module, it automatically maintains the pH value of your pool.
With the TRi PRO module, it automatically maintains the pH value and chlorine level (ACL or Redox potential) of your pool.

It is essential for the water balance of the pool to be checked and adjusted before installing this equipment. Ensuring the water balance of the pool is correct from the start will reduce the likelihood of encountering problems in the first days operation or during the season using the pool.

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Even if it is an automatic control system, it is essential to analyze the water regularly to check the water balance parameters.

	Unit	Recommended values	To increase	To decrease	Test frequency (during season)
pH	/	7.2 to 7.4	Deactivate dosage or add pH+	Automatic (pH minus Perfect pH- or pH-	Weekly
Free chlorine	mg/L or ppm	0.5 to 2	Increase ACL set point or add chlorine	Decrease ACL set point or turn off the unit	Weekly
TAC (alkalinity or buffering power)	°f (ppm)	8 to 15 (80 to 150)	Add alkalinity corrector (Alca+ or TAC+)	Add hydrochloric acid	Monthly
TH (calcium hardness)	°f (ppm)	10 to 30 (100 to 300)	Add calcium chloride	Add calcium binder (Calci-) or decarbonate	Monthly
Cyanuric acid (stabilizer)	mg/L or ppm	< 30	/	Partially drain the pool and refill it	Quarterly
Salinity	g/L or kg/m³	4	Add salt	Leave as it is or partially drain the pool and refill it	Quarterly
Metals (Cu, Fe, Mn...)	mg/L or ppm	± 0	/	Add metal binder (Metal Free)	Quarterly

2.2 Installing the TRi pH or TRi PRO module

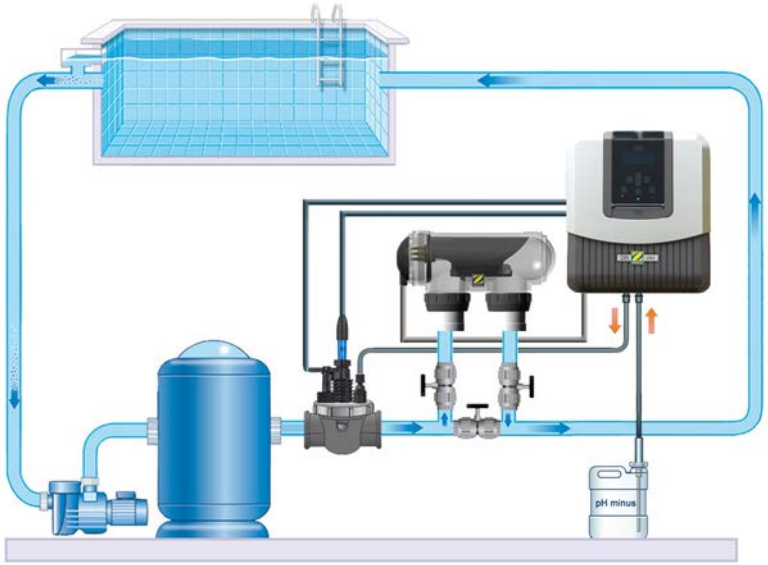
- Turn off your Zodiac TRi salt chlorinator and then filtration by cutting off the main electricity supply in order to isolate the installation.
- Close the isolating valves in the pipework.
- Remove the silver cover by pressing the sides and raising it, then unscrew the four screws attaching the original (empty) lower module to the main unit.
- Remove the empty module and offer up the TRi pH or TRi PRO module.
- Connect the ribbon cable from the TRi pH or TRi PRO to the connector on the TRi power pack.
- Put the TRi pH or TRi PRO module in position, replace the four screws and replace the silver cover.

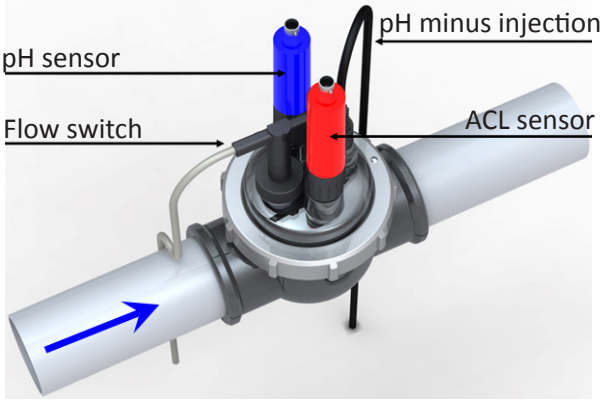
- Do not reconnect the electricity supply until the TRi pH or TRi PRO module, the sensor-holding POD and the pH minus injection pipe have been installed (see § 2.3.3).
- Always wait 2 minutes, particularly when performing any technical work, between disconnecting the TRi from the mains electricity supply and connecting the TRi pH or TRi PRO module.

2.3 Installing the POD

The sensor-holding POD is a single assembly including the flow rate detector (used by your TRi chlorinator, see § 2.3.2), the pH and ACL sensors and pH minus injection.

- The TRi unit bypass valves must always be open.
- The sensor-holding POD must always be positioned on a horizontal pipe so that the sensors are vertical.
- The POD must be the first unit fitted after the pool filter.
- If the pool is fitted with a heating system (heat pump, heat exchanger, electric heater, etc.), the POD must be installed before it (to take readings on unheated water).
- We recommend positioning the POD more than 20 cm from an elbow in the pipe.
- The sensor cables must not be positioned near high voltage mains electricity cables.





Water circulation direction

A badly-installed sensor may give false readings and cause inappropriate operation of the TRi unit. Neither the manufacturer nor the unit shall be liable in this event.


- Identify a suitable length (minimum 30 cm, without elbow) of straight pipe.
- Dismantle the POD and keep the lower part with 2 holes,
- Turn the lower part of the collar upside down and place it in the position where you want to install it on the pipe.
- Use a center-punch or marker pen to mark the position of the holes to be made in the pipe.
- Using the holes saw supplied, cut the 2 feed holes for the POD.

Ensure that the edges of the holes are smooth and deburred!


- Place the upper part of the POD on the pipe, sliding it into the previously-drilled holes.

The arrows on the upper part of the POD collar show the direction of water flow.

Reducer (marked 'EU') Ø50 mm

Collar Ø63

- Click the 2 parts of the POD collar together around the pipe. For a Ø50 mm pipe, use the reducer labeled 'EU'. Do not use this reducer for a Ø63 mm pipe.
- Position the upper part of the POD with its various components in the direction indicated by the foolproof locating notch and tighten the locking ring firmly (hand-tighten only).

2.3.1 Installing the pH and ACL sensors

- Carefully unscrew the protection cap from the sensor.
- Rinse the end of the sensor with tap water and shake off excess water.

Never wipe the sensor using a cloth or paper tissue, as this may damage it!

- Screw the sensor into the threaded hole on the POD until the O-ring seal on the sensor comes in contact with the POD (as shown in picture opposite). Do not use excess strength. If necessary, use the supplied Teflon band.
- Connect the supplied BNC cable to the top of the sensor.

Do NOT screw/unscrew the sensors while they are still connected to their BNC cables. Disconnect the cables beforehand to avoid damage.

- Once installed, the sensors can be connected to the TRi power pack using the BNC sockets labeled “pH” (blue) and “ACL” (red). They must now be calibrated (see § 3.3).

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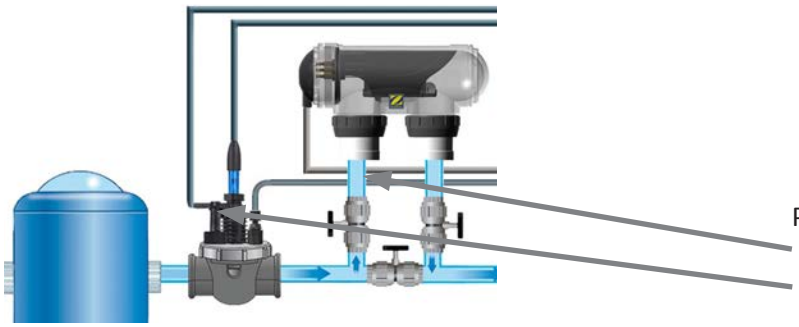
2.3.2 Installing the flow switch

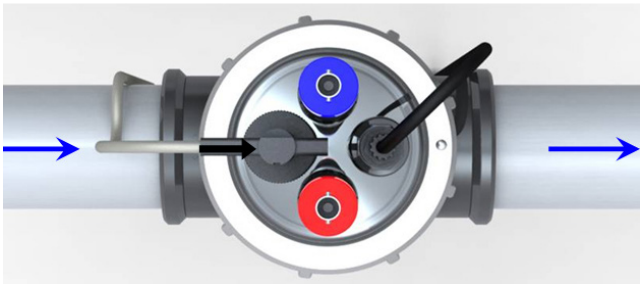


Possible positions of the flow switch:
- after the upstream valve if the cell is bypassed
- on the POD if the cell is in-line

a) TRi pH or TRi PRO module installed at the same time as the TRi chlorinator

- Locate the flow switch supplied with the TRi chlorinator.
- Screw the flow switch into the seat provided on the POD (hand-tighten).

The arrow indicating the water flow direction on the top of the flow switch must be parallel with the pipe on which the POD is positioned.



b) TRi pH or TRi PRO module added to an installation already equipped with a TRi chlorinator

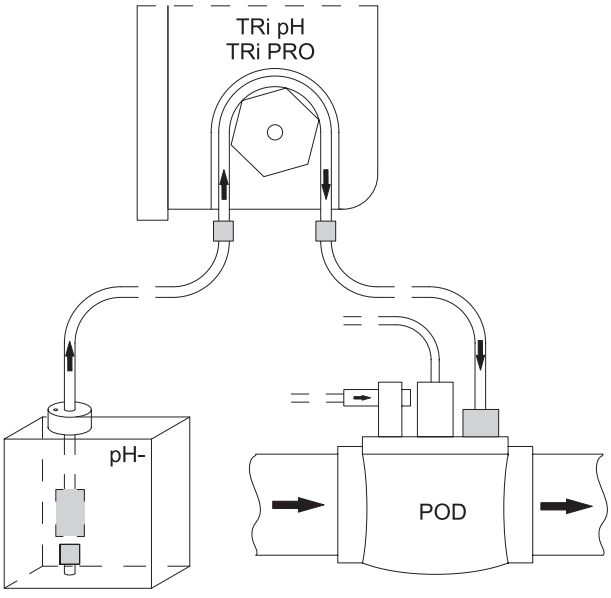
When the swimming pool already has a TRi unit, the flow switch is already installed. Leave the flow switch in place. Unscrew the threaded adaptor located on the POD and replace it with the stopped supplied to seal the hole.

2.3.3 Installing the pH minus injection line

When handling chemical products, always use appropriate safety equipment (safety glasses, gloves and jacket).

a) Installing the injection line (peristaltic pump > non-return valve)

- Remove the protective cover from the peristaltic pump,
- Cut a suitable length of pipe from the coil supplied to connect the peristaltic pump to the injection non-return valve located on the POD
- Attach the pipe to the threaded connector on the peristaltic pump outlet.
- Attach the other end of the pipe to the injection non-return valve.



b) Installing the intake pipe (container > peristaltic pump)

- Cut a suitable length of pipe from the coil supplied to connect the container of pH minus to the peristaltic pump.
- Attach the pipe to the threaded connector on the peristaltic pump inlet.
- Make a hole to fit the diameter of the intake pipe in the cap of the pH minus container and another smaller hole to avoid the container distorting as the product is sucked up.
- Pass the free end of the pipe through the hole made in the cap and put the ceramic counterweight and threaded locking nozzle on the end.
- Ensure that ALL connections are correct and watertight before operating the TRi pH or TRi PRO module.
- Replace the protective cover on the peristaltic pump.

3. Use

3.1 Activating the module

The Zodiac TRi power pack automatically detects the presence of a TRi pH or TRi PRO module. It is now ready to be used with automatic pH control using the TRi pH module or pH and ACL control using the TRi PRO module.

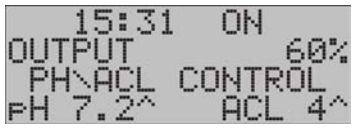
3.2 Display

The LCD screen will display 2 extra lines:
- TRi pH module:

pH set point

- TRi PRO module:

pH set point



ACL set point

A '^' symbol appears to the right of the set point if the value measured by the equipment needs to be corrected automatically (pH of water in the pool higher than the set point and/or insufficient chlorine level). Then pH minus is injected and/or chlorine produced automatically according to the defined cycles.

By default, pH regulation (peristaltic pump in the TRi pH or TRi PRO module) is disabled and the LCD screen will display 'pH ---'. It is enabled automatically about 8 hours after being turned on. To enable pH regulation immediately and so display the set point on the LCD screen, see § 3.6.2.

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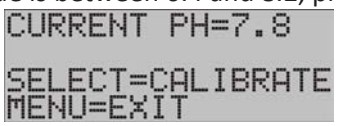
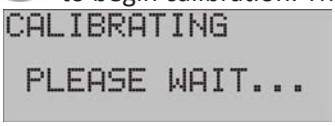
3.3 Calibrating the sensor(s)

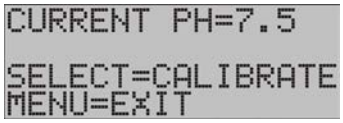
- To operate accurately and reliably, the sensors must be calibrated before using the TRi chlorinator with the TRi pH or TRi PRO module. To maintain maximum efficiency of the unit, we recommend calibrating at least once every 2 months during the period the swimming pool is being used.
- Ensure the sensors are cleaned before calibration (see § 4.1).

- Confirm that the TRi power pack is plugged in,
- Stop the pool pump and isolate the sensors by closing any valves, so as to be able to remove the sensors safely.
- Disconnect the BNC cable from the top of each sensor then remove them (unscrew) from the POD. Then reconnect the BNC cable to the sensors.
- Rinse the end of the sensors with clean water and shake them to remove excess water. Do not touch or wipe the glass bulb at the end of the sensors.
- Put the pH sensor into a sample of the pH7.5 buffer solution supplied.
- Put the ACL sensor into a sample of the 700 mV buffer solution supplied.
- Leave the sensors immersed for about 1 minute to obtain a reliable measurement.
- Press , then use the or keys to display 'CALIB. PH' or 'CALIB. PH/ACL', then press .
- Use the or keys to display 'PH CALIBRATION' or 'ACL CALIBRATION', then press .

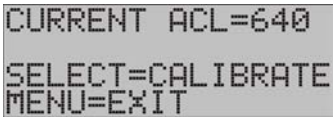
Note the measured value:
- pH = 'X.X'
  - If the value is greater than 8.2 or less than 6.4: the sensor is dirty or has been damaged during transport. Clean the pH sensor (see § 4.1) then repeat the above steps. If the problem persists, contact your reseller.
  - If the value is between 6.4 and 8.2, press to begin calibration. The procedure takes about 15 seconds.

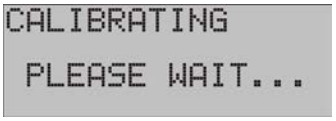


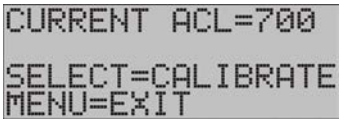




  - When calibration is finished, check that the value displayed equals 7.5, otherwise repeat the calibration.
- ACL = 'XXX'
  - Start the calibration procedure by pressing ; the procedure lasts about 15 seconds,







- If the value is 700: calibration is correct
- If the value is not 700: repeat the calibration steps. If the problem persists, contact your reseller.

- Press or wait 30 seconds to exit.

3.4 Adjusting the set point(s)

The set point is displayed continuously on the LCD home screen.
The default setting for the pH set point is pH7.2 (TRi pH and TRi PRO modules).
The default setting for the ACL set point is 4 (TRi PRO module).
This value provides the ideal compromise to achieve optimum efficiency in terms of water disinfection.

- Calibrating the sensors (see § 3.3).
- Press , then use the or keys to display 'CALIB. PH' or 'CALIB. PH/ACL', then press .
- Use the or keys to display 'PH SET POINT' or 'ACL SET POINT', then press .
- Use the or keys to change the set point value.
- Press or wait 30 seconds to exit.

- The ACL set point displayed by the TRi PRO does not match the free chlorine concentration in the pool. This is the desired level of 'disinfection potential' in the water.
- The ACL set point required to reach the optimum chlorine level is different in every swimming pool. A period manual measurement of free chlorine level in the pool is therefore necessary to adjust this ACL set point.
- To increase the chlorine production potential: increase the ACL set point.
- To decrease the chlorine production potential: decrease the ACL set point.

We recommend checking the free chlorine level in the pool a few days after installing the TRi PRO, to determine if the optimum level has been reached (0.5 to 2 ppm, see § 2.1). If, after this period, the free chlorine level is unsuitable, the ACL set point must be changed.

3.5 Setting the pool volume

List of levels with corresponding volumes:

- Level 1: For small pools up to 40 m³
- Level 2: For mid-size pools from 40 to 60 m³ (default level)
- Level 3: For large pools between 60 and 110 m³
- Level 4: For very large pools over 110 m³

- These values are for guidance only; the choice may vary according to the conditions of use.
- When the volume of the pool is at the limit between 2 levels, it is better to use the higher level.
- However, we recommend not 'over-sizing' the choice of level, to avoid using too much pH minus.
- A dose of pH minus is injected into the pool every 2 hours (when the filtration and TRi chlorinator systems are running).

- Press , then use the or keys to display 'CALIB. PH' or 'CALIB. PH/ACL', then press .
- Use the or keys to display 'POOL VOLUME', then press .
- Use the or keys to select the desired level appropriate to the pool size.
- Press to confirm the choice then press or wait 30 seconds to exit.

3.6 Peristaltic pump

3.6.1 Test / priming the peristaltic pump

After installation, we recommend testing the peristaltic pump for the TRi pH or TRi PRO module and priming it (system normally self-priming).

- Before testing the peristaltic pump, ensure that all pH minus suction and injection pipes are correctly connected.
- Always use appropriate safety equipment when handling chemical products.

- Switch on the TRi power pack (button).
- Press , then use the or keys to display “CALIB. PH” or “CALIB. PH/ACL”, then press .
- Use the or keys to display “TEST DOSAGE”.
- A warning will be displayed briefly, then press to confirm starting the pump. The peristaltic pump will operate for about 30 seconds and will stop automatically.
- If the pump must be stopped immediately, press .
- Confirm that the pump is primed (pH minus solution will be visible in the translucent pipes).

To prime the peristaltic pump more quickly, it may be necessary to repeat these steps several times, depending on the length of the pH minus feed line.

3.6.2 Activating / deactivating the peristaltic pump

For safety reasons the peristaltic pump is not activated when delivered.
When the TRi pH or TRi PRO module is connected to the TRi power pack, the peristaltic pump is programmed to start approximately about 8 hours after being turned on. During this period, the default display on the LCD screen will show “pH ---”.
To activate the peristaltic pump immediately:

- Press , then use the or keys to select “CALIB. PH” or “CALIB. PH/ACL”, then press .
- Use the or keys to reach the “DOSAGE OFF” (or “DOSAGE ON” line if the pump had previously been activated).
- Press to activate the peristaltic pump (“DOSAGE ON”) or deactivate the peristaltic pump (“DOSAGE OFF”).

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4. Maintenance

4.1 Cleaning the sensor(s)

- If the end of the sensor is coated with a greasy film (deposits of cosmetics, suntan lotion, etc.), soak it for a few minutes in warm soapy water. Warning: do not use a detergent, dishwashing liquid is better.
- If the end of the sensor is coated with limescale or if the above procedure is not enough, soak the sensor in a 10% diluted solution of hydrochloric acid for a few minutes (wear the necessary safety equipment).
- Rinse thoroughly with clean water.
- Calibrate the sensor again (see § 3.3).

This acidic cleaning solution can be bought from your reseller or you can make it up yourself by mixing 1 volume of acid with 9 volumes of clean water in a suitable container. ALWAYS ADD ACID TO WATER, NEVER THE OTHER WAY AROUND!

- **Always clean the sensor before carrying out the calibration procedure.**
- **During cleaning, NEVER WIPE THE SENSOR WITH A CLOTH but shake it gently to remove excess rinse water.**

4.2 Winterizing

- Rinse the peristaltic pipe by pumping clean water instead of pH minus solution, using the “TEST DOSAGE” function (see § 3.6.1).
- Unscrew the POD sensors (disconnect their BNC cable beforehand). Place them in their original protective caps or in a container filled with tap water.
- If necessary close the POD holes using the threaded stops.

NEVER leave a sensor to dry and/or exposed to the risk of frost, which would permanently damage it.

5. Troubleshooting

Message	Causes	Solutions
PH LOW	The measured 0.8 PH units or more below the set point	Check the pH in the pool
		Check the set point
		Calibrate or replace the pH sensor
	The pH sensor is dirty, out of calibration or not working	Clean and calibrate the sensor
		Replace the pH7.5 buffer solution if necessary
	The pool size setting is too large	Check the selected pool size
PH ERROR	pH adjustment has performed 5 cycles without reaching its set point (> 10 hours)	Check the pH in the pool
		Calibrate or replace the pH sensor
	The pH minus container is empty	Replace the container
	The peristaltic pump is not primed	Test the peristaltic pump
	The pH sensor is dirty, out of calibration or not working	Clean and calibrate the sensor
		Replace the pH7.5 buffer solution if necessary
	The pool size setting is too small	Check the selected pool size
	The peristaltic pump has not been operated for a total of more than 72 hours	The pH in the pool does not need to be corrected
ACL HIGH	The measured Redox potential is more than 150 mV above the set point (the chlorine level may be excessive)	Clean and calibrate the sensors
		Wait for the error message to disappear (no chlorine production)
	The pH is too low	Ensure that the stabilizer is less than 30 ppm
		Reduce the ACL set point
		Ensure the water is not too mineral (bore-hole water prohibited)
ACL ERROR	ACL adjustment has allowed chlorine production for a total of more than 30 hours without reaching the ACL set point	Check the pH in the pool
		Clean and calibrate the sensors
		Replace the buffer solutions if necessary
		Replace the sensors
		Use the 'boost' mode, if necessary
	The chlorinator has not produced chlorine for a total of more than 30 hours	Check the chlorine level in the pool
		Clean and calibrate the sensors
		Replace the buffer solutions if necessary
		Replace the sensors

To cancel the 'PH ERROR' and 'ACL ERROR' error messages, press  for 3 or 4 seconds when the message appears.
Other codes are only information messages that disappear by themselves when operating conditions return to optimum values.

6. Product registration

Register your product on our Internet site:
- be the first to find out about new Zodiac products and promotions,
- help us continue to improve the quality of our products.

Australia – New Zealand	www.zodiac.com.au
Europe, South Africa & Rest of the World	www.zodiac-poolcare.com

Notes

ZODIAC®

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