NSF Standard(s) Impacted:   NSF/ANSI/CAN 50

Background:

Effective filtration is a crucial process in controlling waterborne disease transmission and protecting public health. Filtration concentrates the undesirable dirt, debris, and pathogens in the filter tank for subsequent extraction by filter cleaning. However, the accumulated matter remains in the water and in the hydraulic circuit, increasing headloss and consuming disinfectants.

Correct cleaning (backwash and rinse for a media filter) extracts dirt, debris, and pathogens from the filter tank and thus from the water, ensuring media maintenance, as well as preventing fouling, clogging and channeling over time. The filter cleaning protocol is defined by the manufacturer and requires that actions be carried out correctly and timeously by the filter maintainer. This critical maintenance task is not assured, monitored, or controlled. Only the accomplishment of the event is recorded in the required maintenance log in public swimming pools.

As technology brings the benefits of improved water quality and public safety through process control automation, the critical filter cleaning task remains “manual” and therefore not optimized. The “NSF/ANSI/CAN 50 – 2019 Equipment and Chemicals for Swimming Pools, Spas Hot Tubs, and Other Recreational Water Facilities” standard “Section 9 Valves” (Annex 1, page 31) refers only to manual valves, with no language for automated valves to backwash and rinse the media filter and fully optimize this task. Furthermore, in automated process control the steps and actions within the cleaning cycle (date/time of the cleaning; valve positions; cleaning durations, pressures prior, during and after cleaning; etc.) are recorded and saved thus better enabling code adherence.

Automated filter maintenance offers a significant improvement in water quality, reduction in consumption and tracking of the essential pool maintenance task, to promote sanitation and protection of the public health.

Recommendation:

The attached Component Certification Specification CCS # 20628 (Annex 1) adds language and establishes evaluation and testing requirements for an automated control valve. The language combines the existing requirements for controllers and filter valves with the following changes:

- An automatic valve positions the valve diffuser and controls flow without manual manipulation, reducing risk of error, incorrect use, and equipment damage, posing a significant risk to maintainers and the public in recreational water facilities.

Paragraph 2.2 establishes the positive indexing requirements for automatic valves where a manual handle does not exist.
• Overpressure can damage equipment, result in flooding and electrical damage, and pose a significant health risk to maintainers and the public in recreational water facilities.

Paragraph 3.1.2 establishes a reduced pressure limit due to active pressure limitation. This active pressure protects the filter, piping, sensors and other equipment from overpressure and damage and thus contributes significantly to safety in the equipment room and around the recreational water facility.

All other language in the CCS # 20628 mirrors the exiting NSF/ANSI/CAN 50 standard.

We hereby request that this language be approved and included in the standard.

Under the current global health crisis, equipment manufacturers, service companies and recreational aquatics facility operators will deploy these technologies to further protect the public from risks associated with the COVID-19 pandemic.

Given the significant public health and safety contributions, we request that the language go straight to ballot for this approval to be granted expeditiously, allowing deployment of these technologies in commercial and residential recreational water facilities under the NSF 50 standard and logo.

Supplementary Materials (photographs, diagrams, reports, etc.):

1. Typical Installations

![Single Filter Installation](image1)

![Multifilter Installation](image2)
2. **Screenshot from the NSF Product Database, showing listing**

   ![](image)

3. **Annex 1 - CCS 20628-01 Automated Controller Valve for use in Recreational Water Facilities**


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   Signature*: Lane Hoy, CEO

   Company: PCFR SAS

   Telephone Number: +33 (6) 75 41 69 59

   E-mail: lane.hoy@poolcop.com

   Is this a revision of a previous Issue Paper (if yes put original issue number): N/A

   Submission Date: July 16th 2020

   **Please submit to: Joint Committee Secretariat, Jason Snider at jsnider@nsf.org**

   *Type written name will suffice as signature*
NSF International
Recreational Water Program
Component Certification Specification
CCS # 20628

Automated Controller Valve for use in
Recreational Water Facilities
NSF Recreational Water Program
Component Certification Specification
Automated Controller Valve CCS # 20628

Disclaimers

NSF, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of NSF represent its professional judgment. NSF shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. NSF shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Standard.

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Preference is given to the use of performance criteria measurable by examination or testing in NSF Standards development when such performance criteria may reasonably be used in lieu of design, materials, or construction criteria.

The illustrations, if provided, are intended to assist in understanding their adjacent standard requirements. However, the illustrations may not include all requirements for a specific product or unit, nor do they show the only method of fabricating such arrangements. Such partial drawings shall not be used to justify improper or incomplete design and construction.

Unless otherwise referenced, the annexes are not considered an integral part of NSF Standards. The annexes provided as general guidelines to the manufacturer, regulatory agency, user, or certifying organization.
Scope:

This Component Certification Specification establishes evaluation and testing requirements for an automated control valve. This standard does not purport to address all possible variables and conditions of use and installation.

1 Materials

1.1 Swimming pool water contact materials

Materials shall not sustain permanent damage or deformation when subject to repeated handling associated with the routine operation and maintenance of the equipment.

Materials intended to be in contact with swimming pool or spa/hot tub water shall not impart undesirable levels of contaminants or color to the water, as determined in accordance with NSF Standard 50, Annex A. The following items are exempt from the material review procedures described in NSF Standard 50, Annex A:

- swimming pool and spa/hot tub components with a surface area less than 100 in² (650 cm²) in direct contact with water;
- swimming pool components with a mass less than 1.4 oz (40 g);
- spa/hot tub components with a mass less than 0.07 oz (2 g);
- components made entirely from materials acceptable for use as a direct or indirect food additive in accordance with 21 CFR 170-199 (Food and Drugs);
- glass (virgin, not recycled);
- series AISI 300 stainless steel;
- titanium alloy grade 1 and 2;
- coatings and components made from materials acceptable for use in contact with potable water in accordance with NSF/ANSI 14 (potable water material requirements), NSF/ANSI 42, NSF/ANSI 51, or NSF/ANSI 61. In order to be qualified under NSF/ANSI 14, 42 or 61, the surface area to water volume ratio of the intended use conditions should meet the requirements of NSF/ANSI 61 when evaluated to the total allowable concentration (TAC) requirements of the standard;

Materials listed under the United States Code of Federal Regulations, Title 21 (Food and Drugs) Part 189 Substances prohibited for use in Human Food, shall not be permitted as ingredients within material contacting pool, spa, and/or hot tub water. This includes arsenic, beryllium, cadmium, mercury, or thallium. Lead should also not be used as an international ingredient in any water contact material except for products meeting the US Safe Drinking Water Act definition of lead free (≤ 0.25% weighted average lead content).
1.2 Corrosion resistance

Material intended to be in contact with swimming pool or spa/hot tub water shall be corrosion-resistant under use conditions or shall be rendered corrosion-resistant by a protective coating. Cathodic protection may be used to improve the corrosion resistance of a material. High-speed parts requiring close tolerances are not required to be corrosion-resistant.

The following materials are considered to have acceptable corrosion resistance for general swimming pool and spa/hot tub equipment applications and are not required to have a protective coating:

- non-ferrous alloys containing not less than 58% copper;
- nickel-copper alloy – Monel 400 (UNS N04400);
- SAE 300 series stainless steel
- thermoplastics and thermoset plastics; and
- concrete

1.3 Dissimilar metals

Dissimilar metals not normally compatible on the electromotive scale shall not be in direct contact with one another (except for sacrificial anode service).

1.4 Insulating fittings

Insulating fittings shall be provided when materials are not compatible (on the electromotive scale) with adjoining fittings or parts of the circulation system. Such fittings shall be electrically nonconductive and shall conform to the applicable requirements of 1.1 and 1.2.

1.5 Materials

1.5.1 Galvanized steel pipe and galvanized iron pipe with cast or malleable iron fittings and bronze or iron-bodied bronze fitted valves are acceptable for use without a protective coating. If such materials have a steel housing, then no insulating fittings are required. Otherwise, all metal pipe with a dissimilar metal housing shall have insulated fittings.

1.5.2 Materials intended for use in water applications with conductivity greater than or equal to 600 ppm shall be made from one of the following materials:

- aluminum brass (UNS C68700);
- copper-nickel, 10% (UNS C70600);
- copper-nickel, 30% (UNS C71500);
- nickel-copper alloy – Monel 400 (UNS N04400); or
- thermoplastics or thermoset pipes conforming to the applicable sections of NSF/ANSI 14.

2.1 General Design and Construction

2.1.1 Valves and component parts that may require inspection and service shall be accessible.

2.1.2 Valves shall be marked or keyed for proper assembly and operation.

2.1.3 Valves shall be designed so that parts may be replaced without drilling or otherwise altering the valve or replacement part.
2.2 Positive indexing

2.2.1 Automated valves shall be marked so that the position of the operating handle or mechanism clearly indicates each operation.

2.2.2 Automated valves shall be designed so that the position of the operating handle or mechanism can only be changed intentionally.

2.2.3 Automated valves shall be designed so that the operating handle or mechanism, if removed, may only be properly realigned.

3.0 Pressure

3.1.1 Standard Design Pressure

The working pressure of a pressure service valve or manufactured manifold or operational system associated with single or multiple tank filter system shall be 50 psi (344 kPa) or greater. The design burst pressure of a pressure service valve or operational system associated with single or multiple tank filter system shall be designed to have a burst pressure of at least four times the working pressure (i.e., minimum safety factor = 4:1).

3.1.2 Reduced Pressure

If the pressure of the automated valve is limited by an active pressure reducing system or the installation parameters, the design working pressure of the vessel shall be specified by the manufacturer.

If the automated valve pressure is limited by the installation parameters (gravity fed) then the manufacturer shall identify the max pressure for the specific installation parameter.

3.2 Pressure service

The valve or manufactured manifold and its integral components shall not rupture, leak, burst, or sustain permanent deformation when subject to the following conditions in accordance with the following: (NSF Standard 50, Annex D):

— a hydrostatic pressure equal to 1.5 times the working pressure for 300 s;
— 20,000 consecutive pressure cycles per B.1.4.d; and
— a hydrostatic pressure equal to two times the working pressure per B.1.4.e.

3.3 Vacuum service

3.3.1 The design collapse pressure of a vacuum service valve shall be at least 1.5 times the pressure developed by the weight of the water in the tank (i.e., minimum safety factor = 1.5).

3.3.2 Vacuum service valves shall not rupture, leak, collapse, or sustain permanent deformation when subjected to a vacuum of 25 in Hg (85 kPa) for 300 s in accordance with Annex B, Section B.2.

3.3.3 Vacuum service valves are exempt from port leakage testing.

3.4 Valve leakage

Filter system valves and manufactured manifolds, when operating at the test pressure and maximum design flow rate, shall not leak in excess of 3 mL from the waste port and 30mL from the return-to-pool port in the 5 min test.

4.0 Head loss curve
4.1 The manufacturer shall make available a head loss curve for all positions.

4.2 The actual head loss across a valve or manufactured manifold shall not exceed the head loss indicated by the manufacturer’s head loss curve by more than 5% (see NSF Standard 50, Annex D, Section D.4).

4.3 The head loss curve for manufactured manifolds may be calculated using a standard friction loss table and actual valve head loss data.

5.0 Waste port seal

The filter system valve or manufactured manifold shall not leak more than 3 mL in a 5 min test through the waste port when the valve is set in the position and a static pressure of 0 to 10 psi (70 kPa) is applied to the return port (see NSF Standard 50, Annex D, Section D.5).

6.0 Installation and operating instructions

The manufacturer shall provide a manual with each automated valve or manufactured manifold. The manual shall include operating instructions, installation instructions, design head loss curve and parts lists, and any drawings or charts necessary to permit proper installation, operation, electrical interlock for chemical a circulation pump and maintenance.

7.0 Identification

The valve shall be clearly and permanently marked or labeled with the following:

- manufacturer name and contact information (address, phone number, website, or prime supplier);
- model number;
- working pressure;
- vacuum pressure, if applicable;
- operating setting; and
- special requirements for switching between settings (e.g., the pump shall be shut off prior to switching the valve position).

8.0 Relay Life test

Three automated valves shall be evaluated per NSF Standard 50, Annex N, Section N.2.4. A minimum of one of three valve controllers shall complete 110,000 actuation cycles, and a minimum of 295,000 cycles shall be accumulated between the three controllers. None of the controllers shall fail at or below 80,000 cycles. Each cycle shall consist of operating the controller for 1 s-on / 9 s-off, at the manufacturer’s maximum rated load. The life test is independent of other tests. The display tests shall be performed after the chemical resistance tests.

9.0 Chemical resistant materials

Valve controller sensor parts normally in contact with the chemically treated water shall be resistant to the solutions specified in NSF Standard 50, Annex N, Section N.1.2.

10.0 Monitor display

The automated controller shall be equipped with a display that indicates:

- operation status (if the parameter is above or below set point);
whether the automated controller is working properly as specified in 12.0.

if an automated controller has a digital or analog display, then applicable parameter levels (pH, ORP, etc.) shall be displayed using the following units of measurement, as applicable:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORP</td>
<td>millivolts (mV)</td>
</tr>
<tr>
<td>pH</td>
<td>pH units</td>
</tr>
<tr>
<td>temperature</td>
<td>°F or °C</td>
</tr>
<tr>
<td>Turbidity</td>
<td>Nephelometric Turbidity Units</td>
</tr>
<tr>
<td>free available chlorine or bromine</td>
<td>ppm or mg/L</td>
</tr>
<tr>
<td>total chlorine or bromine</td>
<td>ppm or mg/L</td>
</tr>
</tbody>
</table>

11.0 Performance

11.1 Operating conditions

The automated controller shall respond with output signals that accurately correspond with the varying input signal when tested per Annex N at four increments between 0% and 100% of the operating ranges specified in Table 11.1. The automated controller may be tested at four increments between 0% and 100% of the manufacturer's full operating range if it is more restrictive than a range listed in Table 18.1. The automated controller shall meet the requirements of this section before and after the chemical resistance test.

Table 11.1 – Operation range for automated controllers (as applicable)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Suggested Operation Ranges</th>
<th>Measurement Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORP</td>
<td>650 to 850 mV</td>
<td>± 20 mV</td>
</tr>
<tr>
<td>pH</td>
<td>6.8 to 8.2</td>
<td>± 0.2</td>
</tr>
<tr>
<td>free available chlorine or bromine</td>
<td>0 to 10 ppm as Cl₂</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>0 to 20 ppm as Br₂</td>
<td></td>
</tr>
<tr>
<td>total chlorine or bromine</td>
<td>0 to 10 ppm as Cl₂</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>0 to 20 ppm as Br₂</td>
<td></td>
</tr>
</tbody>
</table>

For other parameters, testing shall be conducted at four increments between 0 and 100% of the full operating range.

If an automated controller does not have a digital or analog display, then an alternate means of verification shall be conducted. This alternate shall be outlined by the manufacturer and shall be able to demonstrate control of the pH and chlorine values of the water as specified in Table 11.1.

11.2 Set point

At any set point within a parameter range specified in Table 18.1, an automated controller shall provide an equipment actuation signal (actuate) in response to the signal from an applicable sensor. The actual parameter value at which the automated controller actuates shall be within the tolerance specified in Table 11.1 relative to the set point.

12.0 Failure sensing and signaling devices

The valve controller shall possess a default mechanism or process capable of detecting and delivering a distinct visible signal to notify the user when the controller is not operating correctly.

13.0 Operational protection

13.1 The automated controller shall have an automatic mechanism for preventing the operation of any chemical feeder actuated by the controller whenever water circulation at the chemical injection points is interrupted.
13.2 The controller shall automatically turn off the equipment actuated by the controller when:

- a parameter maintained by the automated controller remains outside the set point range for longer than the manufacturer’s recommended time limit;
- an equipment operation cycle (e.g. chemical feed cycle) exceeds the manufacturer’s recommended time limit.
Installer and User Manual

Date: November 4th, 2019
Manual Version: AP43EN.0
Firmware Version: V43
Product Versions: PoolCop Evolution
Change Summary

September 30th, 2019            Original Issue
November 4th, 2019             FW version display
March 2nd, 2019                Updated to latest V43 features
March ##, 2020                 NSF logo updated,
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Section 1  INTRODUCTION

1.1  Foreword
We maintain a policy of continuous research and development and therefore reserve the right to make changes and improvements to this manual and any of the products described.

Any reference in this manual to “the pool owner” refers also to the owner of the product or products. The owner may appoint a representative to act on their behalf. The owner retains full and all responsibility for decisions made by and the actions of this representative.

Any reference to “American Pool” includes American Pool, Poolman, Clearly Poolman, Langley and Taylor, All Florida Pool & Spa Center, Pearl, Wilcoxon, Specialty Pool and Fountain, Superior Pool Spa and Leisure, and any other brands used by American Pool Enterprises Inc.

1.2  Notes, Cautions, Warnings and Definitions

Within this manual some information is highlighted in the form of notes, cautions, warnings, etc.

The following definitions apply throughout:

NOTE
A step, procedure, technique, etc. which is considered important or essential to emphasize.

CAUTION
A step, procedure, technique, etc. which could result in damage to equipment if not carefully followed.

WARNING
A step, procedure, or technique which could result in personal injury if not carefully followed.

NSF/ANSI CCS 20628
A step, procedure, or technique required to comply with NSF/ANSI CCS 20628 where required.

Read the installation manual and warnings completely.
Follow all instructions.

WEAR HAND PROTECTION
Always wear correct chemical resistant hand protection when handling chemicals.

EYE PROTECTION
Always wear correct eye protection when handling chemicals.

May
An acceptable or suggested means of accomplishment.

Should
Normally used to indicate a preferred but non-mandatory method of accomplishment.

Must, will
The instructions or procedures are mandatory.

As installed
The instructions or procedures depend on the specific model or version of equipment installed.

If installed
The instructions or procedures depend on whether the equipment is installed.

As required
The instructions, procedures, or requirements are mandatory depending on relevant conditions.
Verify

A planned change in an indication, annunciation, or message is observed to occur as expected. Check the state or condition prior to proceeding.

1.3 IMPORTANT INFORMATION, SAFETY NOTICES AND PRECAUTIONS

WARNING:
Read the security instructions attentively before any use. Instructions given below are all important for your safety.

PoolCop is a product of superior design, engineering and manufacture and should be treated with care. The information contained in this section will help you fulfil the warranty obligations and make use of this product for many years.

Always respect all norms for electrical, hydraulic, chemical and swimming pool installation and operation. No responsibility will be accepted for installation or use of this product outside the applicable norms.

For the swimming pool to remain a place of pleasure and user-friendliness, it is necessary to take care of the safety of those who bathe and of the installation standards.

The electric connections must be carried out, according to the applicable norms, by a qualified person.

WARNING:
Keep the equipment and all associated equipment out of the reach of public and animals.

WARNING:
Inappropriate use can cause accidents, bodily injury, fire, electrocution, system failure and flooding.

CAUTION:
Keep the covers closed at all times when not interacting with the equipment to prevent inadvertent damage.

CAUTION:
Do not drop any objects into any openings of the equipment and the associated equipment as this could cause serious damage.

CAUTION:
Equipment and the associated equipment must be located in an area protected from the elements.

CAUTION:
Equipment are splash proof but must never be exposed to water or other liquids for extended periods. Precipitation, humidity and liquids contain minerals that will corrode electronic circuits.

WARNING:
Equipment should not be installed near flammable gas or products. In the event of the escape of gas or dangerous products, there is risk of fire and explosion.

WARNING:
Do not remove any of the protective covers on the equipment or the associated equipment. Touching parts inside these compartments could result in an electrical shock and/or damage to the system.
CAUTION:
Do not use harsh chemicals, solvents or detergents to clean the equipment. Wipe with a soft cloth, slightly dampened in a mild soap-and-water solution.

WARNING:
In case of malfunction or if an anomaly occurs (such as a smell of burning from the unit), disconnect the power supply and contact a qualified technician.

CAUTION:
Use only approved replacement parts. Unauthorized parts and/or modifications could damage the entire system and will void your warranty.

CAUTION:
Verify that any auxiliary equipment is correctly installed as per the manufacturer’s instructions and is compatible with the equipment and installation.

WARNING:
Risk of Electric Shock.
Connect only to a grounding type receptacle protected by a ground-fault circuit interrupter (GFI). A dedicated GFI circuit breaker installed by a licensed electrician is recommended.

WARNING:
Installation requires a properly located GFI protected receptacle. Never use an extension cord for electrical connections to the controller.

WARNING:
Always disconnect power before servicing.

WARNING:
Power cord should be inspected frequently. A damaged power cord must be replaced immediately to reduce the risk of electric shock.

WARNING:
Always mount controller in a safe area not subject to damage by moving objects. Never bury controller power cords.

WARNING:
Always disconnect power and ensure that the electrical current is shut off before servicing.

WARNING:
Never operate a controller without functional flow protection.

WARNING:
Any person using, adjusting, or monitoring the equipment must be at least 18 years of age and be familiar with these instructions and the contents of this manual.
### 1.4 Useful Conversions

#### Temperature

<table>
<thead>
<tr>
<th>Centigrade °C</th>
<th>-12</th>
<th>-7</th>
<th>-1</th>
<th>0</th>
<th>4</th>
<th>10</th>
<th>16</th>
<th>21</th>
<th>27</th>
<th>32</th>
<th>38</th>
<th>43</th>
<th>49</th>
<th>54</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fahrenheit °F</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>32</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
<td>100</td>
<td>110</td>
<td>120</td>
<td>130</td>
<td>130</td>
</tr>
</tbody>
</table>

#### Pressure

<table>
<thead>
<tr>
<th>Bar</th>
<th>0</th>
<th>0.1</th>
<th>0.2</th>
<th>0.3</th>
<th>0.4</th>
<th>0.5</th>
<th>0.6</th>
<th>0.7</th>
<th>0.8</th>
<th>0.9</th>
<th>1.0</th>
<th>1.2</th>
<th>1.4</th>
<th>1.6</th>
<th>1.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psi</td>
<td>0</td>
<td>1.5</td>
<td>2.9</td>
<td>4.4</td>
<td>5.8</td>
<td>7.3</td>
<td>8.7</td>
<td>10.2</td>
<td>11.6</td>
<td>13.1</td>
<td>14.5</td>
<td>17.4</td>
<td>20.3</td>
<td>23.2</td>
<td>27.6</td>
</tr>
</tbody>
</table>

#### Volume

| m³   | 20  | 40  | 60  | 80  | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| USG  | 5300|10600|15800|21100|26400|31700|37000|42300|47600|52800|58100|63400|68700|

#### Flow Rate

<table>
<thead>
<tr>
<th>m³/hr</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>24</th>
<th>28</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPM</td>
<td>9</td>
<td>18</td>
<td>26</td>
<td>35</td>
<td>44</td>
<td>53</td>
<td>62</td>
<td>71</td>
<td>79</td>
<td>88</td>
<td>106</td>
<td>123</td>
<td>141</td>
</tr>
</tbody>
</table>

---

**NSF/ANSI CCS 20628:**
If the equipment is used for pH, ORP or any other treatment control, a water circulation flow detection sensor must be correctly installed and configured to comply with NSF/ANSI CCS 20628 where required. A Flow Switch is supplied for this purpose.

**WARNING:**
Always take and record manual water chemistry readings in conformance with Health Department requirements. Although automated controllers are a great aid in maintaining healthy water quality, controllers are not a substitute for manual water testing with an accurate test kit.

**WARNING:**
Always read and become familiar with Material Safety Data Sheets (MSDS) and safe handling instructions for all chemicals used with the controller.

**CAUTION:**
The automatic controller should not be installed where it is accessible to the public.

**WARNING:**
Always take and record manual water chemistry readings in conformance with Health Department requirements. Although automated controllers are a great aid in maintaining healthy water quality, controllers are not a substitute for manual water testing with an accurate test kit.

**CAUTION:**
The automatic controller should not be installed where it is accessible to the public.
## Section 2  Warranty, Records

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2.1 **POOLCOP EVOLUTION WARRANTY REGISTRATION CARD**

Review the warranty details in the product manual. Detach or scan this warranty card. Promptly complete and return this warranty registration. If information is incomplete or missing it will result in the product not being registered.

www.poolcopusa.com

Email: contact@poolcopusa.com

<table>
<thead>
<tr>
<th>Product:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ PoolCop Evolution 1.5”</td>
<td>☐ PoolCop Evolution 2”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brand / Model N°:</th>
<th>Name of Installer:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Serial Number:</th>
<th>Installer’s Company:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Purchased From:</th>
<th>Telephone:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date of Purchase:</th>
<th>Date of Installation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM / DD / YYYY</td>
<td>MM / DD / YYYY</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SURNAME:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>First Name:</th>
<th>City / Town:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>e-mail:</th>
<th>Postal Code:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Telephone:</th>
<th>Country:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

☐ I would like to receive product maintenance reminders.
☐ I would like to receive product information and news.

**Signature:**

**Date:** MM / DD / YYYY

The serial number is located on the left side of the (Control and Connection Unit (CCU):

![Figure 1 - Serial Number Locations](image-url)
2.2 POOLCOP EVOLUTION WARRANTY

Before using the product, we recommend that you carefully read the user manual in which you will find all the usual precautions.

Return the warranty registration card completed with the serial number to activate the warranty. This warranty applies only if the defective product is presented within the warranty period, accompanied by the original invoice or receipt (clearly indicating the purchase date, the model of the device and the reseller's name). PoolCopUSA reserves the right to refuse warranty service if these documents are not presented or if they are incomplete or illegible. The warranty will not apply if the model name or serial number on the product has been altered, wiped out, deleted, torn, perforated or made illegible. The warranty is valid for 2 (two) years from the date of delivery (see Conditions). This warranty does not cover consumables or parts with limited lifespan (e.g. batteries, sensors, seals and O-Rings ...). The warranty is automatically invalidated if the customer does not notify PoolCopUSA of the latent defect or the alleged non-compliance within 20 (twenty) days from its discovery. The customer is responsible for proving the date of the discovery.

PoolCopUSA is only obliged to repair or replace, free of charge, defective or nonconforming parts, at its discretion, and without the customer being entitled to obtain damages for any cause whatsoever. Original spare parts are available from PoolCopUSA. The use of other than genuine parts voids the warranty.

Terms:

- This product is covered by a limited warranty of 2 (two) years, excluding consumables or parts with limited warranty (see below).
- The warranty start date is defined as follows
  - This is the date of commissioning, if the installer returns the warranty registration card (see §2.1);
  - Otherwise, if the registration card is not returned, the billing date of the first-level distributor to the first client will be used.
- The product warranty period will be reduced to 1 (one) year if no proof of the first annual service can be provided. The first annual service must be conducted and recorded in the maintenance book by a qualified technician or a person authorized by PoolCopUSA. The annual service checklist and the maintenance card are detailed in the user manual (a copy of this manual can be provided on request).
- If the product is not installed by a qualified technician or an authorized reseller, the warranty is limited to 90 days.
- PoolCopUSA provides no warranties (express, implied, statutory or otherwise) for the product, the product software or the software accompanying the product, including the accuracy of the information provided or suitability for a particular purpose.
- Consumables and parts with limited warranty:
  - 12V SLA battery is guaranteed for 1 (one) year from date of delivery of the product;
  - The pH or pH+ORP sensor is guaranteed for 2 (two) years from date of commissioning;
  - The valve gasket is guaranteed for 2 (two) years from date of commissioning and subject to normal use.

The warranty does not cover:

- Defects and deterioration of products due to abnormal conditions of storage, especially in case of an accident of any kind whatsoever, will void the PoolCopUSA warranty. The warranty applies only to products that have become the property of the buyer. It applies only to products wholly distributed by PoolCopUSA. The warranty is automatically voided should the products be used under conditions for which they were not designed. A design flaw is not a latent defect and customers of PoolCopUSA are deemed to have received all the technical information on products sold. PoolCopUSA does not cover damage resulting from wear requiring an adaptation or a special assembly, abnormal or not, of the product unless it was conducted under PoolCopUSA’s supervision.
- Viral infections or the use of the product with software not supplied, or software incorrectly installed.
- Neglect.
- A loss of water tightness of the Valve Data Unit following an assembly error, installation error or a lack of attention on a sealing element or its installation (sensors, electrodes, O-Rings, hoses, clamps, etc.).
- Accidents, fire, liquids, chemicals other substances, flooding, vibrations, excessive heat, improper ventilation, power surges, excess or inadequate power supply, radiation, electrostatic discharge including lightning, other forces and external influences.
- Transportation costs and the risks associated with production of the product.

Exclusions and Limitations:

PoolCopUSA is not responsible for the consequences of action taken in response to a displayed value. The results obtained by the product are not the responsibility of PoolCopUSA, whatever the causes and consequences. It is the user’s responsibility to verify the displayed values and the proper functioning of the unit.

In the context of this warranty, the PoolCopUSA’s sole obligation is to repair or replace products which meet the conditions of this warranty. PoolCopUSA is not responsible for any loss or damage relating to products, to service, to this warranty or any other, including:

- Loss of use of the pool;
- Financial losses;
- Price paid for the product;
- Loss of profit revenue, data, enjoyment or use of the product or associated products;
- Loss or indirect loss or accidental damage;
- Any direct or any indirect prejudice linked to the unavailability of the product for whatever duration.
### 2.3 POOLCOP EVOLUTION CONFIGURATION CARD

#### Owner

<table>
<thead>
<tr>
<th>Surname, Name:</th>
<th>Pool Address or Location:</th>
</tr>
</thead>
</table>

#### Filtration Equipment

<table>
<thead>
<tr>
<th>Pool Volume:</th>
<th>m³</th>
<th>Pool Type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter Make/Model:</td>
<td>Make / Model</td>
<td></td>
</tr>
<tr>
<td>Filter Nominal Rate:</td>
<td>GPM m³/hr</td>
<td></td>
</tr>
<tr>
<td>Filter Media:</td>
<td>Type / Changed</td>
<td></td>
</tr>
<tr>
<td>Pump Make/Model:</td>
<td>Make / Model</td>
<td></td>
</tr>
<tr>
<td>Pump Nominal Rate:</td>
<td>GPM m³/hr</td>
<td></td>
</tr>
</tbody>
</table>

#### PoolCop: Details

<table>
<thead>
<tr>
<th>Model Installed:</th>
<th>Serial Numbers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Installed:</td>
<td>Warranty Valid until:</td>
</tr>
</tbody>
</table>

#### PoolCop: Configuration

| Pool Volume: | m³ |
| Flow Rate: | m³/hr |
| Turnovers: | /day |
| Protect Freeze: | YES / NO |
| Cover Reduction: | % |
| Type of Pool: | Classic / Infin.A / Infin.B / Spa |

<table>
<thead>
<tr>
<th>Pool Data</th>
<th>Filter Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure:</td>
<td>Bar</td>
</tr>
<tr>
<td>Frequency:</td>
<td>Days</td>
</tr>
<tr>
<td>Cleaning:</td>
<td>Inhibit / Manual / Auto</td>
</tr>
<tr>
<td>Backwash duration:</td>
<td>Sec</td>
</tr>
<tr>
<td>Rinse duration:</td>
<td>Sec</td>
</tr>
<tr>
<td>Waste valve:</td>
<td>YES / NO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pump Data</th>
<th>Water Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>YES / NO</td>
</tr>
<tr>
<td>Low Alert:</td>
<td>Bar</td>
</tr>
<tr>
<td>Prot. Pressure:</td>
<td>Bar</td>
</tr>
<tr>
<td>Prot. Pump:</td>
<td>YES / NO</td>
</tr>
</tbody>
</table>
| Cyc 1 Speed / Cyc 2 Speed: | /
| Clean Speed: | |
| Input 1: | FLOW |
| Function: | CLOSE |
| Action when: | Alert |
| Input 2: | FLOW / pH / CL / Salt / etc. |
| Function: | OPEN/CLOSE |
| Action when: | Alert |

#### PoolCop: Optional Integrated Water Treatment

<table>
<thead>
<tr>
<th>pH Control (Aux 7)</th>
<th>ORP Control (Aux 6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed:</td>
<td>YES / NO</td>
</tr>
<tr>
<td>pH Mode:</td>
<td>pH⁻ / pH⁺ / Read</td>
</tr>
<tr>
<td>Setpoint:</td>
<td>6.8 - 8.0</td>
</tr>
<tr>
<td>Installed:</td>
<td>YES / NO</td>
</tr>
<tr>
<td>Read Only / Chlorine / Salt / Bromine / Others:</td>
<td></td>
</tr>
<tr>
<td>ORP Mode:</td>
<td>mV</td>
</tr>
<tr>
<td>Setpoint:</td>
<td>901 - 990</td>
</tr>
</tbody>
</table>

#### PoolCop: Filtration Timer

<table>
<thead>
<tr>
<th>Daily Filtration Settings</th>
<th>PoolCop: Auxiliary Timers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode:</td>
<td>STOP/TIMER/ECO+ / VOLUME/CONTINUOUS</td>
</tr>
<tr>
<td>Timer Cycle1:</td>
<td>ON - OFF</td>
</tr>
<tr>
<td>Timer Cycle2:</td>
<td>ON - OFF</td>
</tr>
<tr>
<td>Aux ID</td>
<td>Mode</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>Aux1:</td>
<td>ON - OFF</td>
</tr>
<tr>
<td>Aux2:</td>
<td>ON - OFF</td>
</tr>
<tr>
<td>Aux3:</td>
<td>ON - OFF</td>
</tr>
<tr>
<td>Aux4:</td>
<td>ON - OFF</td>
</tr>
<tr>
<td>Aux5:</td>
<td>Waste</td>
</tr>
<tr>
<td>Aux6:</td>
<td>ORP</td>
</tr>
</tbody>
</table>

#### XM8: Inputs

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Function</th>
<th>Action</th>
<th>Alert</th>
</tr>
</thead>
<tbody>
<tr>
<td>In3</td>
<td>OPEN/CLOSE</td>
<td>Y / N</td>
<td></td>
</tr>
<tr>
<td>In4</td>
<td>OPEN/CLOSE</td>
<td>Y / N</td>
<td></td>
</tr>
<tr>
<td>In5</td>
<td>OPEN/CLOSE</td>
<td>Y / N</td>
<td></td>
</tr>
<tr>
<td>In6</td>
<td>OPEN/CLOSE</td>
<td>Y / N</td>
<td></td>
</tr>
<tr>
<td>In7</td>
<td>OPEN/CLOSE</td>
<td>Y / N</td>
<td></td>
</tr>
<tr>
<td>In8</td>
<td>OPEN/CLOSE</td>
<td>Y / N</td>
<td></td>
</tr>
<tr>
<td>In9</td>
<td>OPEN/CLOSE</td>
<td>Y / N</td>
<td></td>
</tr>
<tr>
<td>In10</td>
<td>OPEN/CLOSE</td>
<td>Y / N</td>
<td></td>
</tr>
</tbody>
</table>

#### XM8: Auxiliary Timers

<table>
<thead>
<tr>
<th>Aux ID</th>
<th>Mode</th>
<th>Timer</th>
<th>Slave</th>
<th>DOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aux8:</td>
<td>ON - OFF</td>
<td>Y / N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aux9:</td>
<td>ON - OFF</td>
<td>Y / N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aux10:</td>
<td>ON - OFF</td>
<td>Y / N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aux11:</td>
<td>ON - OFF</td>
<td>Y / N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aux12:</td>
<td>ON - OFF</td>
<td>Y / N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aux13:</td>
<td>ON - OFF</td>
<td>Y / N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aux14:</td>
<td>ON - OFF</td>
<td>Y / N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aux15:</td>
<td>ON - OFF</td>
<td>Y / N</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[www.poolcopusa.com](http://www.poolcopusa.com) [www.americanpool.com](http://www.americanpool.com)
2.4 ROUTINE MAINTENANCE

2.4.1 Routine Pool Maintenance

Routine basic maintenance needs to be carried out to ensure that the pool remains in good condition. This guide does not describe how to maintain pools and water treatment. Follow company procedure and manufacturer’s instructions.

2.4.2 PoolCop Maintenance

Basic maintenance needs to be carried out to ensure that the equipment successfully manages the pool.

2.4.2.1 Regular Periodic Checks

- Check for Alerts: Alerts and messages are the means of communication about the state of the pool. Check regularly or at any time when in doubt about a condition.
- Check and Replenish Consumables: Ensure that consumables level is always sufficient. Consumables must be replenished timeously to ensure that optimal treatment and balance is maintained in the pool.
- Check General Condition: Check the general condition of the equipment as well as the electrics, hydraulics and all accessories.

WARNING:
Chemical consumables are hazardous substances and must be handle with extreme care and caution.

2.4.2.2 PoolCop Evolution Annual Service

The equipment requires an annual service by a qualified American Pool technician. Refer to the equipment Maintenance Card (2.4.2.3) for details and dates due.

Essential service items are:

- Check battery every 12 months. The battery should last for 3-5 years and must be replaced if a malfunction occurs.
- Check pH sensor calibration every 12 months. The sensor should last 3-5 years and must be replaced if malfunction occurs.
- Check for leaks, especially to waste.
- Lubricate the valve gasket with pure silicon grease.
- Check condition of the pool equipment.
- Check water balance.
- Replace the valve diffuser every two years.
2.4.2.3 PoolCop Evolution Site Visit Checklist

The following checklist will maintain equipment in good condition and optimize service calls.

<table>
<thead>
<tr>
<th>Date</th>
<th>Firmware version</th>
<th>Client</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>维</td>
<td>维</td>
<td>维</td>
<td>维</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Item</th>
<th>Checked</th>
<th>Replaced</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Check Power and Battery LEDs on CCU.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td></td>
<td>Check data: Valve Position, Pressure, Temperature, pH, ORP, Date/Time.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td>Essential pool water data: TAC =</td>
<td>pH =</td>
<td>CyA =</td>
<td>ORP =</td>
</tr>
<tr>
<td>Leaks</td>
<td>Start pump and check no leaks to waste, check pressure.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td>Pressure</td>
<td>Check no leaks inside/outside.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td>Valve Rotation</td>
<td>If pool water level is OK do a Filter Cleaning Cycle. Check valve rotation (no abnormal noise). Check filter cleanliness.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td>pH</td>
<td>Stop the pump; check the zero pressure (static head). Set/adjust protection pressure accordingly.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td>pH Control</td>
<td>If not OK check/calibrate sensor (ensure TAC &gt;80ppm)</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td>Disinfection Control</td>
<td>Set timers for immediate start. Check pH feeder pump operation.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td>Battery</td>
<td>If possible, run the filtration for 30 minutes and check ORP disinfection system.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td>Valve Gasket</td>
<td>Put valve in WASTE position. Remove power supply and check that the valve rotates to the safe position (normally FILTER). If not: • Check battery voltage &gt;11.5VDC. • When battery is disconnected, charging circuit voltage should be &gt;13.5V.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td></td>
<td>Loosen the VDU from valve housing, check and grease gasket. If damaged or leaking, replace the diffuser.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
</tbody>
</table>
### 2.4.2.4 PoolCop Evolution Maintenance Card

<table>
<thead>
<tr>
<th>PoolCop Evolution Maintenance Card</th>
<th>Date Due</th>
<th>Date Carried Out</th>
<th>By:</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Installation</strong></td>
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PoolCop is guaranteed for 2 years provided that warranty conditions are met.
2.4.3 Pool Winterization

2.4.3.1 Active Winterization

Maintaining the pool year-round avoids heavy chemical shock treatment, the use of expensive treatment and cleaning products, and much labor. Suggested Settings:

- The filtration mode should be set to ECO with the second filtration cycle during the coldest time of the day, e.g. 06h00 - 07h00. The filtration will run for a minimum of 1 hour each day.
- Set freezing mode protection ON (in Pool Data menu).
  - See 4.4.4.7 Antifreeze Protection.
  - Filtration will run at any time should a freezing risk be detected based on water and air temperatures (as installed).
- pH regulation will continue to function normally.
- Disinfection is stopped when the threshold temperature is reached (default is 15°C; this can be adjusted in Configuration/Maintenance menu).

2.4.3.2 Passive Winterization

It is recommended that the equipment remains ON and electricity supply connected to keep the battery in good condition, additionally this keeps internal circuits warm and dry. Suggested Settings:

- The pump and all accessories (pool cleaner pump, heat pump, etc.) should be switched OFF at the appropriate circuit breaker.
- Select the filtration mode STOP; the timers will display 00:00.
- Purge the water circuit, including the VDU.
- Ensure that the water level control is stopped (Configuration/Water Level; the mode must be “Read Only”); purge the refill circuit.
- Remove the pH+ORP sensor from the VDU and store in a location away from risk of freezing; use the sensor transport cap supplied or a small jar to ensure the end of the sensor remains moist.
- Remove the sensor holder from the VDU and seal with the original plug.

2.4.4 Re-Commissioning the Equipment

When re-opening the pool after passive winterization (or out or service for a period of time) carry out the following procedure:

- Replace the pH+ORP sensor if removed.
- Perform an annual service (as per 2.4.2.2 Annual Service).
- Continue with the normal maintenance cycles of the pool and the equipment.
## Section 3 INSTALLATION GUIDE

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3.1 General

- Installation of the equipment will be done only by qualified and experienced technicians.
- Failure to correctly install the equipment according to this manual will void the warranty.
- This installation manual is intended to be used as a checklist; check the boxes next to installation steps ensuring that all steps are completed in the correct sequence.
- It is recommended that the Configuration Card be used to keep notes of settings, configuration and notes during the installation; this will facilitate easy completion of the required post installation documentation.

<table>
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<tr>
<td>The PoolCop is a management system, and not a repair system.</td>
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<td>Technicians must verify that the swimming pool and all equipment are in an acceptable condition prior to commencing the installation.</td>
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<td>As the installer, if you are not satisfied with the condition of the pool or any equipment these must be repaired and tested prior to commencing the installation of the equipment.</td>
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<td>As the installer, ensure that any repairs are only carried out with the full knowledge and consent of the pool owner.</td>
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<td>Contact PoolCopUSA with any queries and for more information.</td>
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3.2 Pre-installation Preparation and Inspection

A PoolCop Evolution installation has the following obligatory components:

- **VDU**: Installed on the filter, replacing the multiport valve. Each filter requires its own VDU if it was equipped with a manual multiport valve.

- **CCU**: Installed on the wall, typically adjacent to the electrical junction box. The CCU contains the electrical connections for control of all pool equipment and provides electrical supply to the VDU.

- An **Air Temperature Sensor** is supplied with the CCU: optionally use the supplied sensor for freezing detection, alternatively use an external thermostat.

- A **Flow Switch** is supplied with the CCU: if the equipment is used for pH, ORP or any other treatment control, a water circulation flow detection sensor must be correctly installed and configured to comply with NSF/ANSI 50 where required.
PoolCop Evolution Options:

- **Water Level Control**: Water level is controlled by means of a water level sensor, a control valve and a water supply located on the equipment pad (installed in the pool water return line).
- **Water Treatment Control**:
  - **pH Control**: using dosing of pH- or pH+.
  - **Disinfection**: using ORP control, timed volumetric dosing.
  - **Flow Switch**: if the equipment is used for pH, ORP or any other treatment control, a water circulation flow detection sensor must be correctly installed and configured to comply with NSF/ANSI 50 where required.
- **Control of auxiliary equipment**: Up to 6 auxiliary relays allow control of other equipment (lighting, heating, cleaners, irrigation, etc.) and external water treatment equipment.
- **Backup Waste Valve** for additional security in the waste line.
- **Drum Level Sensors** for detection of drums requiring replenishment.
- **XM8 Extension Module** adds an extra 8 inputs and 8 relays outputs.

Before commencing installation, the technician should confirm the following with the pool owner:

- VDU is compatible with the pool’s filter.
- Preferred location of CCU.
- Preferred location of the Air Temperature Sensor.
- Water Level Control (optional):
  - Location of sensor and routing of the water level sensor wiring.
  - Routing of water supply to water level controller valve.
  - Preferred location of water shut off valve.
- Water Treatment (optional):
  - Type of pH control.
  - Type of disinfection.
  - Type of oxidation remnant, if required.
- Auxiliary equipment connected and controlled by equipment (optional).
- Remote control: Routing of RJ45 cable or Powerline Adapters or Wi-Fi Adapter details and codes.
- Pool Condition:
  - There is no debris in the pool.
  - Pool water is acceptably clean.
  - Water balance is in the acceptable range.
  - Condition of the pool’s electrical system in general and the electrical box in particular.
  - Condition of the filter, and the filter media.
  - Skimmer and pump pre-filter baskets are clear of debris.
  - Pool light and other equipment is working.

While the pool pump and filtration system are running, installers must verify the following:

- The condition of the pool pump and motor.
- Leaks on the entire plumbing and filter system.
- The hydraulic coefficient of the filtration system is adequate.

When ready to commence the installation, the installer must:

- Disconnect all electrical power to the pool and systems.
- Close all valves, and if necessary, block all inlets to and outlets from the pool.
  This will prevent water from flowing to the multiport valve and into the pump house during installation and is especially important if the water level of the pool is higher than the pump and filter installation.
### 3.3 INSTALLING THE VDU

The VDU is supplied with a standard schedule 80 ABS multiport valve housing (1.5" or 2.0").

Due the large variety of possible installations, it may be necessary to adapt piping and connectors to fit the VDU to the filter and pump combination. Use standard and acceptable pool plumbing parts and norms at all times.

---

**CAUTION:**
Incompatible multiport valve housings may not allow correct functioning of the automatic valve and the filtration system and will invalidate the warranty.

**WARNING:**
Verify that all electricity supply is disconnected and that the water supply is shut off prior to commencing the installation.

**CAUTION:**
Ingress protection rating is IP54. Ensure that the unit is installed in a location that complies with the rating limitations.

---

#### 3.3.1 Valve Housing Mounting on Filter

- For renovation, first remove the manual valve housing from the filter by draining the filter and loosening the fittings.
- Install the VDU valve housing on the filter using a filter connection kit or standard PVC parts.
- Make sure the glue is properly dry and strong enough before mounting the VDU on the valve housing.

**CAUTION:**
Incorrect gluing negatively affects the bonding quality and water tightness. ONLY lightly sand the parts to be glued.

The valve housing is made of ABS, never use solvents, solvent based cleaners or primers or adhesives. Never use solvent based adhesives. Never use glue for “flexible” or for “rigid and flexible” PVC.

---

#### 3.3.2 Mounting the VDU on the Housing

- **1.5" Valve**
  - Lubricate O-Ring with the silicon grease provided.
  - Place the O-Ring gasket on the bottom of the VDU.

---

*Figure 6 - VDU*

*Figure 7 - 1.5" Valve O-Ring*
2.0" Valve
- Lubricate O-Ring with the silicon grease provided.
- Place the O-Ring gasket on the 2.0" Adapter.

Fit the VDU with O-Ring into the multiport valve housing.
Verify the alignment of the VDU by referencing the alignment arrow decals:

CAUTION
Apply a layer of pure silicon grease (provided) on the valve gasket and inside the valve housing. Lubricate the O-Rings and gaskets.

Verify that the VDU is correctly orientated before continuing.
Check that the valve alignment dots line up correctly.
If not correctly aligned the valve will not achieve correct performance and water tightness.

Using a spherical head 5mm Allen key and 10mm open spanner:
- **1.5" Valve**: Secure the VDU to the valve housing using the 4 short and 2 long cap screws and all 6 nuts (the flat washers will be placed under the heads of the cap screws). Tightening torque 6Nm.
- **2.0" Valve**: Verify that the VDU is correctly secured to the 2.0" adapter ring by means of the 4 short and 2 long cap screws into the captive nuts in the adapter ring (with flat washers placed under the heads of the cap screws). Using a 5mm spherical head Allen key, secure the adapter ring to the valve housing using the 10 cap screws and nuts. Tightening torque 6Nm.

CAUTION:
Fasten in a cross-over sequence.
Do not over-tighten the screws.
Tightening torque is 6Nm.
3.4 INSTALLING THE CCU

3.4.1 Mounting the CCU

CAUTION:
Use only existing predrilled holes for mounting the CCU.
Any additional holes or openings risk water entry, foreign matter penetration and damage.

CAUTION:
The CCU must be mounted with the cable compression glands and cable entries at the bottom.
Incorrect mounting risks water entry, foreign matter penetration and damage.

CAUTION:
All unused compression glands must be blocked with the supplied red blanking plugs.
If an RJ45 cable is not fitted, the connector must be blocked with the supplied cap.

CAUTION:
The ingress protection rating is IP54.
Ensure that the unit is installed in a location that complies with the rating limitations.

☐ The CCU must be mounted:
  • Within 4 meters of the VDU location.
  • With the cable entry compression glands at the bottom.
  • Essentially vertically and level.
  • Securely, it is provided with 4 screws and 4 anchors for concrete. Ensure the mounting surface material is compliant with these anchors or use the correct anchor according to local building code regulation.
  • In a location not exposed to excessive dust (the CCU is protected from limited dust ingress).
  • In a location not exposed to jets of water (the CCU is protected from water spray from any direction).

☐ Open the CCU cover:
  • A flat screwdriver is needed to release the 4 clips.
  • Use a T5 Tamperproof Torx to loosen the 4 screws.

3.4.2 Electrical Connection

Read “§1.3 Important Information, Safety Notices and Precautions” before starting electrical connection.
CCU box is provided with compression glands size PG9 (for external diameter 3.5mm to 8mm, tightening 13Nm), PG11 (for external diameter 4mm to 10mm, tightening 20Nm) and PG13.5 (for external diameter 6mm to 12mm, tightening 25Nm). The cables must pass through the appropriate compression gland size according their diameter and the compression gland must be tightened to the recommended setting to secure the cable.

3.4.3 Cables Selection and Connection

☐ For pump and auxiliary control: SPT-1 or SPT1-W, 2 cores, AWG18.
☐ Smaller sections and multiple conductor cables can be used depending on amperage (ex JZ-602 12G0.5).
☐ Cable selection must conform with local building code regulation.
☐ Disconnect the battery.
☐ Feed the VDU Data Link cable through the hole on the bottom left of the CCU. Secure the cable.
☐ Connect the 7-pin connection to J4 and the 9-pin connection to J5.
☐ Connect the RJ45 male end to the RJ45 pass-through connector.
Plug the cord to a 5-15P socket, make sure the socket is secured by a 15 Amps bipolar breaker. Before powering up, check that the 115V/230V selector position is selected for 115V.

**CAUTION:** If switching to 230V for any reason, the fuses F1 and F2 must be replaced by 160mA slow blow 5x20mm cartridge fuse.

**Relay Output Connection:**

- The pump relay K1 is a dedicated relay for primary pump control and will not be used for other function.
- Auxiliaries can be connected via relays K2 - K7.
- See the appropriate section of this manual for connection details.
- Feed auxiliary equipment control cables through appropriate compression gland into the CCU.
- When using multi strand cable, use a cable end.
- Always crimp the cable ends together as close as possible to the connector (see Figure 10 - Terminals above)
### 3.4.4 Connecting a Single Speed Pump

- Disconnect the power supply to and from the existing pump timer.
- Disconnect the pump timer, or remove if appropriate, noting the wires that are connected to the pump or pump protection and relay.
- Connect the pool pump control circuit to the relay K1 (labelled “PUMP”) on J6.

#### CAUTION:
- This is a dedicated relay and will only be used for the pool pump.
- Controlling a pump will require a separate pump relay; this relay will be controlled via the PUMP relay K1.

- If connecting a single (or two) phase(s) pump:
  - It is recommended that pool pumps have an independent supply, and that the PUMP relay K1 be used to control the external pump relay.
If connecting three-phase pump:
- The pump must have an independent supply, and the PUMP relay K1 will be used to control the external two- or three-phase pump relay.

### 3.4.5 Connecting a Variable Speed Pump

See the VARIABLE SPEED PUMPS GUIDE downloadable on our internet website [www.poolcop.com](http://www.poolcop.com) in RESOURCES /DOWNLOADS section for compatibility, connection, control and programming.

**WARNING:**
Never exceed the power ratings. Max Output 12VDC is 100mA. Max Output 24VAC is 450mA
Always conform to local installation norms and requirements.
3.4.5.1 Pentair IntelliFlo VSD/VSF (with IntelliComm or IntelliComm II drive)

Figure 16 - Pentair IntelliFlo VSD/VSF with IntelliComm or IntelliComm II

3.4.5.2 Pentair SuperFlo VS/VS2

Figure 17 - Pentair SuperFlo VS/VS2
3.4.5.3 Hayward EcoStar

![Hayward EcoStar Diagram]

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<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>6</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>7</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>8</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>

Figure 18 - Hayward EcoStar

3.4.5.4 Hayward VSTD Series

![Hayward VSTD Diagram]

<table>
<thead>
<tr>
<th>Speed</th>
<th>Pump</th>
<th>Aux1</th>
<th>Aux2</th>
<th>Aux3</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOP</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>1</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>2</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>3</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
</tbody>
</table>

Figure 19 - Hayward VSTD Series
3.4.5.5 Zodiac FloPro VS

This is option is not related to a specific pump but can be used to control several mono speed pumps.

3.4.5.6 Binary Combination

This is option is not related to a specific pump but can be used to control several mono speed pumps.

Figure 20 - Zodiac FloPro VS

Figure 21 - Binary Combination
### 3.5 Installing Standard Features

#### 3.5.1 Air Temperature Sensor

The optional Air Temperature sensor measures outside air temperature, displays this on the screen, and is used for antifreeze protection if configured in the Pool Data menu.

- Disconnect all electrical power to the pool and systems.
- Switch the equipment **OFF** and open the CCU.
- Fit the Air Temperature Sensor to J27

![Figure 22 - Air Temperature Sensor on J27](image)

- Route the sensor and cable via a compression gland to a location where external air temperature is representative of actual temperature to which the pool surface is exposed. Secure the sensor cable in an appropriate manner.

⚠️ **CAUTION:**

Keep a minimum distance of 10cm between the air temperature sensor cable and any 120V/230V power cable to avoid disturbance due to capacitive coupling.

- Close the CCU cover.
- Switch the equipment **ON**.
- Check the VDU main screen for air temperature display.

#### 3.5.2 Circulation Flow Detection Sensor

A water circulation sensor must be installed to prevent chemicals to be injected when there is no flow at the injection points. The water circulation sensor is installed in the return line to the pool upstream of the chemical injection points. Whenever no flow is detected, pH injection is inhibited, disinfection is inhibited, and any auxiliaries slaved to filtration pump are stopped. All these functions will restart automatically as soon as the water circulation is re-established. The installer must ensure that the sensor will react properly in case of:

- Loss of priming (no flow, no pressure).
- Pipe blockage (no flow, normal or high pressure).

⚠️ **WARNING:**

If the equipment is used for pH, ORP or any other treatment control, a water circulation flow detection sensor must be correctly installed, configured and tested to comply with NSF/ANSI 50 where required.

A Flow Switch is supplied for this purpose.

The flow sensor cable must be routed through a compression gland and must be connected to the input(1) in the CCU. Sensor is delivering a **Normally Open** potential free contact, which will close when flow is detected (see 8.4 Flow Switch for details). By default, from factory settings, input(1) is pre-configured properly to inhibit treatment in case of no flow.
The flow switch must be:

- Installed using a suitable reducing tee:
  - Ensure correct pipe dimension (PVC Schedule 40/80, in 1.5” or 2” for example)
  - The tee nozzle length should be ≤ 18mm between the gasket seat on the flow switch and the inside of the Tee
  - The tee nozzle thread must be ½” FNPT with no reduction at the bottom of the thread
  - Examples of Schedule 40 PVC Reducing Tee SLIP x SLIP x FPT
    - For 1.5” piping - LASCO Fittings 402209 (1½ x 1½ x ½)
    - For 2.0” piping – LASCO Fittings 402247 (2 x 2 x ½)

- Installed in the return line to the pool
- Mounted on a horizontal pipe
- Installed after (downstream) all the pool equipment (filter, heater, solar, etc.)
- Installed with at least a 30 cm straight pipe run before (upstream) the flow switch
- Installed before the chemical injection or salt cell
- Adjusted to the correct paddle length according to the pipe diameter:
  - The paddle can be cut at various lengths upon pipe diameter
  - There are cutting lines numbered 1 to 9 every 5mm
  - There must be a 5 mm minimum gap between end of the paddle and opposite pipe wall (see Figure 29)

- Fitted with PTFE thread tape to ensure water tightness

---

**WARNING:**

The flow switch must be installed in a horizontal pipe section. Never install on a vertical position.

**NOTE:**

Because “Flow Switch” is set by default on Input(1), if the flow sensor is not installed, chemicals dosing as well as any auxiliaries which are slaved to pump will not be actuated.
 Orientated with the arrow on the switch housing exactly parallel to the pipe in the direction of water flow.

 Wired to Input(1) with the cable routed through a compression gland.

 Tested to ensure proper operation:

 • In **MANUAL CONTROL, PUMP**, start the pump, wait for priming and stable water circulation.
 • In **CONFIGURATION, INPUTS** menu, check the current status of the input(1). Status should be **ON**, if status if **OFF**, check the wiring and Input(1) configuration (see 5.6.4).
 • In **MANUAL CONTROL, PUMP**, stop the pump.
 • In **CONFIGURATION, INPUTS** menu, check the current status of the input(1). Status should be **OFF**, if status if **ON**, check the wiring and Input(1) configuration (see 5.6.4).

### 3.5.3 Connecting Auxiliary Relays

An auxiliary relay acts as a switch in the same way as the mechanical switch or timer.

- Auxiliary relays can control auxiliary pool equipment, such as lights, heating, pool cleaners, etc.
- Auxiliary **Aux7** is dedicated to pH Control.
- With ORP Control installed and configured, **Aux6** is dedicated to ORP Control.
- With a Backup Waste Valve installed and configured, **Aux5** is dedicated this valve control.
- With Extension Module and Pool cover function installed, **Aux14** is dedicated to open cover, **Aux15** to close.
- With Extension Module and Jetstream function installed, **Aux13** is dedicated to Jetstream pump control.

Each auxiliary relay has its own dedicated timer, programmed in the PoolCop **CONFIGURATION MENU**. Auxiliary relays can be given a default name or a custom name from the list available. Relays can be slaved to the pump.

### 3.5.3.1 Connection Instructions

**WARNING:**

Never exceed the power ratings.

Max Output 12VDC is 100mA. Max Output 24VAC is 450mA.

Always conform to local installation norms and requirements.

- Disconnect the supply to and from the existing auxiliary timer.
- Disconnect the manual timer or other control, removing this if appropriate, noting the wires that are connected to the auxiliary equipment.
- Use multi-core cable to connect the auxiliary circuits to the auxiliary relays (Aux1 to Aux6) in the CCU.
- The auxiliary relay functions in the same manner as a mechanical timer.
- The wires should be connected in the applicable slots on connectors J6/J19 (CCU) or J1/J2(XM8) (Figure 27 - Auxiliary Relay Connection).
3.5.3.2 Relay Timer Programming

Each auxiliary relay can be programmed with one daily timer cycle. Auxiliary relays can be slaved to run only if filtration is running (valve in positions FILTER and BYPASS). See for 5.3 Auxiliaries Menu further information.

3.5.3.3 Additional Relay Cycles

If required for additional daily cycles, the same equipment can be connected via additional relays, to switch and control using additional daily timer periods. Other Aux relays can be used wired in parallel, each providing an additional ON cycle per day.

3.5.4 Connecting Inputs

Several types of sensors and equipment can be connected to add functionality and trigger alerts. Inputs must be connected between the chosen input channel and the GND.

CAUTION:
Inputs are polarized with 5VDC. Ensure that the signal connected to each input is potential free to avoid damage.
The Input can be assigned to any predefined functions with direct action (action when the contact is closed) or reverse action (action when the contact is open). Inputs must be potential free contacts. The configuration menu lets you select the role and direction of action of each entry.

The inputs are situated:
- in the CCU, and are labelled Input (1) and Input (2); see Figure 44 - Connecting Inputs in CCU
- in the XM8 Extension Module and are labelled In(3) to In(10); see Figure 45 - Connecting Inputs in XM8

![Figure 32 - Connecting Inputs in CCU](image)

![Figure 33 - Connecting Inputs in XM8](image)

### 3.5.4.1 External Thermostat

<table>
<thead>
<tr>
<th>NOTE:</th>
<th>An external thermostat is not required if the Air Temperature Sensor is installed.</th>
</tr>
</thead>
</table>

Freezing risk can be detected by means of a properly installed and configured external thermostat if installing the Air Temperature Sensor is not possible. Generally, the temperature setting is in the range -5°C to +5°C, depending on location of the sensor. Refer to the instruction manual for the thermostat for full details. The thermostat is connected to the selected input and to the GND. An Open or Closed circuit indicates a freezing risk; contact action is configured in programming.
3.5.4.2 Detection of Low Consumables Level

Connected to an Input in the CCU and correctly configured, the detection indicates consumables level low, triggering an Alert. Set the low-level switch according to the manufacturer’s instructions.

Multiple suction wands (or other low consumable detection circuits) for different consumables, can be connected in series. Any detector at low level will trigger the alert.

3.5.4.3 Pool Cover Detection

An external pool cover sensor can be connected to an Input to inform PoolCop that the cover is in the closed position. Programming in the Pool Data menu then allows for adjustment of filtration duration (in ECO+) and water treatments.

3.5.4.4 Salt System Attention Needed

A compatible salt water chlorination system can use this Input configuration to alert conditions requiring intervention.

3.5.4.5 Filtration External Start or Stop

Filtration can be started or stopped by using an Input. This is suitable, for instance, when using a heating system to start the filtration pump.
3.6 INSTALLING WATER TREATMENT

3.6.1 General

The equipment is compatible with all water treatments. There are no specific restrictions on use of any legally permitted swimming pool water treatment with equipment. Follow all manufacturer recommended guidelines to ensure safety, correct dosing and equipment life.

There are two types of sensors available, the sensors have the same dimensions and fit the same housing in the VDU:

<table>
<thead>
<tr>
<th>Treatment Option</th>
<th>Sensor Required</th>
<th>Sensor Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH + liquid chlorine injection; chlorine or bromine tablets</td>
<td>pH+ORP Pt Sensor kit</td>
<td>SO4902</td>
</tr>
<tr>
<td>pH + salt water system</td>
<td>pH+ORP Au Sensor kit</td>
<td>SO4903</td>
</tr>
</tbody>
</table>

**WARNING**
A flow sensing device should be properly installed and configured to secure chemicals dosing. If the flow sensing device is not added or not correctly configured and pipe is blocked, chemicals may build up in the pipes. Releasing the flow may create unsafe water chemistry conditions locally in the pool and may harm people.

**WARNING:**
If the equipment is used for pH, ORP or any other treatment control, a water circulation flow detection sensor must be correctly installed and configured to comply with NSF/ANSI 50 where required. A Flow Switch is supplied for this purpose.

**WARNING:**
Certain precautions must be taken PRIOR to installation of the sensor to ensure correct measurement and to prevent the possibility of damage: Install and test an electrical earth bonding in accordance with local regulations. Test the water for presence of metals (iron, zinc, copper) and use a metal sequestrate treatment in any case.

3.6.2 Installing the Water Condition Sensor

The water condition sensor has a housing in the VDU. Installation of the different type of pH+ORP sensors is the identical.

- Verify that the pump circuit breaker is OFF, and/or set all pump timers to 00:00 in FILTRATION MODES menu, with filtration timer mode to STOPPED.
- Close all valves; ensure that all possible water supply is cut off.
WARNING:
There is a risk of flooding if the pump timers were to switch the pump ON or the water supply is not cut off.

- In MANUAL CONTROL menu, select the valve to the WASTE position.
- Ensure that the valve housing is depressurized and drained, by unscrewing the drain plug on the rear of the housing.

CAUTION:
Removing the electrode from the housing whilst there is pressure or a head of water in the valve and piping can cause water to flood the VDU causing damage to the equipment.

- Remove the blanking plug and fit the sensor housing, with O-Ring.
- Remove the liquid filled transport cap from the sensor.

CAUTION:
The transport cap must be removed prior to fitting the sensor. Fitting the sensor without removing the transport cap will result in erroneous pH and ORP readings and chemical regulation.

- Check/adjust the grab ring, the grab ring must be between 25-30mm from the sensor shoulder.

Figure 42 - Grab Ring Adjustment

- Check/adjust compression ring and O-Ring accordingly.
- Fully insert the sensor into the housing, and secure with the nut.
- Finger tighten the securing nut.

CAUTION:
Do not over-tighten as the electrode is a sensitive device. Ensure that the cap is sufficiently secure to retain the sensor in place under water pressure.

- Remove the plastic cover from the PCB’s.
- Connect the sensor wire plug to the top Connection PCB.
- Replace and secure the plastic cover.
- Open valves and reconnect water supply, whilst checking for leaks.
- Reconnect the pump circuit breaker.
- Reset the filtration timers and mode as required.
- Start the pump from MANUAL CONTROL menu and check for leaks.
- Leave the pump running or switch the pump from MANUAL CONTROL menu, as required.
3.6.3 pH Control

**WEAR HAND PROTECTION:**
Always wear correct chemical resistant hand protection when handling chemicals.

**EYE PROTECTION:**
Always wear correct eye protection when handling chemicals.

pH control requires the pH+ORP sensor.

pH is automatically measured 15 minutes after the end of each filtration cycle. The updated pH is displayed immediately. If only one filtration cycle is set, the pH is measured automatically once per day; if both filtration timers are set, pH is measured automatically twice per day.

pH can be measured at any time by first stopping the filtration pump, and then selecting **MEASURE PH** in **MAINTENANCE** menu. Filtration and water circulation is stopped to prevent static electricity affecting the accuracy of the pH measurement. It is recommended to wait 15 minutes after stopping the pump prior to measuring pH to allow static to completely discharge.

pH information is used for pH control functions and Alerts. However, independent pH control systems can be installed with the equipment. In this case equipment can be used to measure pH and trigger Alerts if the pH is out of the normal range.

3.6.3.1 pH Sensor Calibration

The sensor can be calibrated using pH buffer fluids or liquids of known pH. It is recommended to calibrate pH using an external buffer liquid or pool water in an isolated container, rather than in the VDU itself. This avoids the risk of stray currents in the pool affecting the calibration sequence.

Calibration procedure is described in the **MAINTENANCE MANUAL** (procedure SMU_07_EN) downloadable on our internet website www.PoolCop.com in RESOURCES /DOWNLOADS section.

3.6.3.2 Information and Guidance

The equipment has proportional-integral pH Control. An ON/OFF feeder pump (peristaltic or electromagnetic) and installation kit is required. pH Control logic and safety:

- The dosing is executed once at the beginning of each filtration. It is recommended to program two daily filtration cycles, to enable two dosing periods per day. **Filtration should be stopped at least 30 minutes between 2 filtration cycles to allow pH algorithm to work properly.**
- Proportional-integral control logic allows for very safe operations and avoids risk of overdosing.
- Setting the maximum dosing time is a way to adjust control power. Maximum dosing must be adjusted in accordance with pool volume, water alkalinity and the feeder pump flow rate to provide best results.
- Whatever are the settings, maximum dosing time is **30 minutes per filtration** cycle (60 minutes per day if the recommendation for two cycles is respected).
- The pH Control relay AUX 7 is protected and injection will be stopped in the case of loss of valve position, loss of flow, loss of pressure, pump off securities, etc. for safety.
- An alert will be generated if pH is not in an acceptable range (lower than 6.9 or higher than 8.2). pH control will continue to operate normally.
- An alert will be generated if pH does not change after 5 successive injections to indicate that the control is ineffective.
- As a security, if the measured pH is out of limits (lower than 6.0 or higher than 9.5), pH control is stopped. An Alert message is displayed prompting for water balance.

**NOTE:**
As a security, if the measured pH is out of limits pH control is stopped.

- As soon as the pH re-enters the range 6.0 - 9.5, injection may restart.
3.6.3.3 Installing the Feeder Pump

- Install the feeder pump, associated suction and injection pipes and connectors as per the feeder pump installation manual.
- Ensure that the correct liquid consumable pH- or pH+ is installed and secured.
- Route the power supply for the feeder pump via a 24V Coil AC Contactor. The contactor will be operated by AUX 7 in the CCU.
- Connect the feeder pump to the mains power supply as per the pump installation manual, ensuring electrical protection and conformity.

![Figure 43 - pH Feeder Pump Connection](image)

- Test and prime the feeder pump:
  - In WATER AND TREATMENT, PH CONTROL, select priming ON.

3.6.3.4 pH Control Programming

- Refer to 5.4.2 pH Control.

3.6.3.5 Activating pH Control

- In the MAINTENANCE menu, command the equipment to MEASURE PH.

3.6.4 Disinfection

- WEAR HAND PROTECTION:
  - Always wear correct chemical resistant hand protection when handling chemicals.

- EYE PROTECTION:
  - Always wear correct eye protection when handling chemicals.

The equipment is compatible with all types of water disinfection. Disinfection can be with or without chemicals.

3.6.4.1 Means of Disinfection

3.6.4.1.1 Chemical Injection by Feeder Pump or Other Equipment

- Install the feeder pump or other equipment, associated suction and injection pipes and connectors as per the equipment installation manual.
- Ensure that the correct consumable is installed and secured.
- Route the power supply for the equipment via a 24V Coil AC Contactor. The contactor will be operated by the chosen auxiliary output in the CCU.
- Connect the equipment to the mains power supply as per the equipment installation manual, ensuring adequate electrical protection and conformity.
NOTE:
If injection is controlled by ORP sensor, the feeder pump must be controlled by Aux 6.

NOTE:
If injection is controlled by temperature / volume (remnant) any available Aux can be used.

Test and prime the feeder pump, if applicable:
- In **MANUAL CONTROL** menu, select the respective **AUX** to **ON**; the equipment or pump must run.
- Or in **WATER AND TREATMENT, ORP CONTROL**, select priming **ON**.

### 3.6.4.1.2 Salt Water Chlorination

A correctly specified salt water chlorination system and installation kit is required. When salt water chlorination is used for treatment, regular water analysis will be carried out to ensure that salt consumables and free chlorine levels remain within the required limits. Refer to the manufacturer’s guidelines and instructions for use.

- Install the salt water chlorinator and associated plumbing as per the manufacturer’s instruction and installation manual.
- Ensure that the correct quantity of salt consumable is added in the correct manner to the pool water.
- Route the power supply for the salt chlorinator via a via a 24V Coil AC Contactor. The contactor will be operated by the AUX 6 in the CCU.
- Connect the salt chlorinator to the mains power supply as per the manufacturer’s installation manual, ensuring adequate electrical protection and conformity.
- If the chlorinator is compatible, an Input can be used for LOW SALT and other messages as per 3.6.6 Connecting Inputs.
Testing the salt water chlorinator power supply:
- Select the filtration to ON (the salt water chlorinator requires water flow for proper operation).
- Set the water supply valves as per the salt water chlorinator operating instructions.
- Navigate to the MANUAL CONTROL, AUXILIARIES menu
- Select the respective Aux to ON; the chlorinator must be powered.
- Select the Aux to OFF.

Refer to the salt water chlorinator instruction manual for correct settings and running time for the pool.

### 3.6.4.2 Disinfection Control

#### 3.6.4.2.1 Controlled by ORP

ORP control is available for controlled disinfection. A sensor is required to perform the control. The water condition sensor type varies, depending on the chemical method used for treatment.

<table>
<thead>
<tr>
<th>Treatment Option</th>
<th>Sensor Required</th>
<th>sensor reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH + liquid chlorine injection; chlorine or bromine tablets</td>
<td>pH+ORP Pt Sensor kit</td>
<td>SO4902</td>
</tr>
<tr>
<td>pH + salt water system</td>
<td>pH+ORP Au Sensor kit</td>
<td>SO4903</td>
</tr>
</tbody>
</table>

**NOTE:**

ORP measurement and control is not compatible with copper or copper/silver ionization.

- pH+ORP sensor is required, correctly installed as per 3.5.2.
- Dosing is only commanded during programmed filtration cycles. Dosing will start 30 minutes after start of a filtration cycle.
- Proportional-integral control logic allows for very safe operations and avoids risk of overdosing.
- If “chlorine” or “bromine” disinfection algorithm is chosen, maximum possible time assuming filtration is running continuously will be **11 hours 50 minutes**.
- If “salt” (for salt water chlorinator) disinfection algorithm is chosen, maximum possible time assuming filtration is running continuously will be **19 hours 40 minutes**.
- The relay AUX 6 is protected and injection will be stopped in the case of loss of valve position, loss of flow, loss of pressure, pump off securities, etc. for safety.
- If required, disinfection can be stopped due low water temperature (useful to ensure salt water chlorinator cell life with water temperature below 15°C/59°F).
- An alert that the control is inefficient will be generated if:
  - ORP does not increase after 20 successive injections (algorithm “Chlorine” or “Bromine”).
  - ORP does not increase after 5 successive production cycles (algorithm “Salt”).
NOTE:
As a security, if the measured ORP is out of limits (lower than 100mV or higher than 990mV) for more than approx. 40 minutes, ORP control is stopped. An Alert message is displayed prompting for the issue.

- As soon as the ORP re-enters the range 100mV - 990mV, injection may restart.
- Configure ORP control in the WATER AND TREATMENT menu, program ORP CONTROL (See 5.4.3 ORP Control for further details).

3.6.4.2.2 Dosage controlled by volume and temperature

- This function adjusts disinfectant volume injected based on:
  - Dosing pump flow rate.
  - Pool volume.
  - Water temperature.
- Targeted dosage is 2ml/m³/day.
- Maximum dosing cannot exceed 5ml/m³/day.
- Dosage will progressively be increased to twice the initial amount when water temperature goes from 22°C to 28°C.
- An extra setting will allow to reduce by 50% or increase by 50% to take pool environment into account.
- The dosing relay is protected (loss of valve position, pump off securities, etc.) for safety. For example, in case of priming loss, injection will be stopped.
- Configure Remnant control in the WATER AND TREATMENT menu, program REMNANT INJECTION (See 5.4.4 Remnant Injection for further details).

3.7 INSTALLING OPTIONS

Various equipment options are available. These serve to increase autonomy and enhance functionality.

3.7.1 Water Level Control

Automatic water level control functionality is integrated. In order to benefit from this feature, the optional water level sensor and valve kit is required. After installation, configure Water Level Control in the Configuration menu (See 5.4.1 Water Level).

When ready to commence the installation, the installer must:

- Disconnect all electrical power to the pool and systems.
- Close all valves, and if necessary, block all inlets to and outlets to/from the pool. This will prevent water from flowing to the multiport valve and into the pump house during installation.

3.7.1.1 Installing the Water Line Version, with 4 Terminals

- Secure the water level sensor (using stainless steel self-tapping screws, or appropriate adhesive) at the correct height on the inside of the skimmer or on the waterline.
- If the level sensor is fitted in the skimmer, make sure that the skimmer basket and lid can easily be removed and replaced without damaging the sensor or cable.
- Normal water level must be between WL (HIGH) and WL (LOW).
- WL (HIGH) must be below pool overflow level and at an appropriate level with regards to the skimmer.
- WL (PROT) is the V.HIGH level, at maximum pool water level.

Figure 46 - Water Line Level Sensor

<table>
<thead>
<tr>
<th>PCB Label</th>
<th>TYPICAL Color</th>
<th>ACTUAL Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM</td>
<td>Yellow</td>
<td>--------------</td>
</tr>
<tr>
<td>LOW</td>
<td>Blue</td>
<td>--------------</td>
</tr>
<tr>
<td>HIGH</td>
<td>Red</td>
<td>--------------</td>
</tr>
<tr>
<td>PROT</td>
<td>Green</td>
<td>--------------</td>
</tr>
</tbody>
</table>

Table 2 Water Line Version 4 Terminals, Cable and Connection
3.7.1.2 Installing the Buffer Tank Version, with 4 Sensors (Infinity Pools)

The 4 sensors are identical, with the same color cable. Add tags/labels prior to installation to identify the correct cable and sensor.

- Check that the pool water level is correct and that the buffer tank level is correct.
- Secure the 4 water level sensors at the correct respective heights in the buffer tank.
- Normal tank level must be between WL (HIGH) and WL (LOW).
- WL (HIGH) must be below tank overflow level.
- WL (PROT) is the V.HIGH level, at maximum tank water level.

![Figure 47 - Buffer Tank Water Level Sensors](image)

<table>
<thead>
<tr>
<th>PCB Label</th>
<th>Cable Color</th>
<th>Tag on Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM</td>
<td>Blue</td>
<td></td>
</tr>
<tr>
<td>LOW</td>
<td>Blue</td>
<td></td>
</tr>
<tr>
<td>HIGH</td>
<td>Blue</td>
<td></td>
</tr>
<tr>
<td>PROT</td>
<td>Blue</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 Buffer Tank Version, with 4 sensors

3.7.1.3 Connecting the Water Level Sensors

- Before installing the water level sensor, check the colors corresponding to each terminal using a multi-meter.
- Ensure that the terminals are clean and free of any insulating film or grease.
- Route the wire from the level sensor to the CCU. A conduit will be used to protect the cable.
- Switch the CCU OFF and open the CCU.
- Feed the cable through a compression gland into the CCU.
- Connect the 4 cores to the connector on J20 (see Figure 35 - Connecting Water Level).

![Figure 48 - Connecting Water Level](image)

CAUTION:
Cable core colors may differ for different sensor manufacturing batches. Refer to notes to ensure correct wiring connections are made.
3.7.1.4 Water Supply

- Fit a saddle onto the pool return pipe.
- Drill an appropriately sized hole through the return pipe.
- Fit the non-return valve and the solenoid valve.
- Verify that both valves are orientated correctly.
- Fit a stop valve, to shut off the main water supply when required.
- Use appropriate pipe to connect the main water supply to the solenoid valve.
- If buried, the pipe should be buried to a depth of at least 250mm.
- If not buried, secure the pipe in a neat and adequate manner.
- Once all piping and joints have been completed, open the main supply.
- Verify that the solenoid valve closes and seals correctly. Remove and replace if necessary.
- Verify all piping, joints, and connections for leaks. Repair all leaks before continuing.
- If necessary, extend the 2-core wire of the electrical solenoid.
- Feed the cable through a compression gland into the CCU.
- Connect the 2-core wire from the valve solenoid to the connector on J20 marked (VALVE 24VAC) according to Figure 35 - Connecting Water Level. Polarity is not important.
- Reconnect electrical power supply to the PoolCop CCU.
- Switch the CCU ON.

3.7.2 Installing XM8 Extension Module

Read “§1.3 Important Information, Safety Notices and Precautions” before starting electrical connection. The XM8 Extension Module provides 8 extras digital multipurpose inputs and 8 extras digital outputs (relays). With the Extension Module, extras functionalities are available such as pool cover control or Jetstream control (see 5.6.6 Equipment for more details).

Relay usage will be defined in AUXILIARIES menu (see 5.3 Auxiliaries Menu for details).
Input usage will be defined in INPUTS menu (see 5.6.4 Inputs for more details).

XM8 box is provided with compression glands size PG7 (for external diameter 3.5mm to 8mm), PG9 (for external diameter 3.5mm to 8mm) and PG11 (for external diameter 4mm to 10mm). The cables must pass through the appropriate compression gland size according their diameter and the compression gland must be tightened to secure the cable.

Cables selection:
- For pump and auxiliary control: SPT-1 or SPT1-W, 2 cores, AWG18.
- Smaller sections and multiple conductor cables can be used depending on amperage (ex JZ-602 12G0.5).
- Cable selection must conform with local regulation.

Installing:
- Mount the XM8 in a weather-proof location close to the CCU. Ensure the unit is secured. The Unit is provided with 4 screws and 4 anchors for concrete. Make sure the wall material is compliant with these kinds of anchor or use the correct anchor.
Connecting:

- Shut the CCU power down.
- Open the CCU cover and the XM8 cover with a screw driver.
- Pass the cable for the XM8 Extension Module through a compression gland of the CCU and secure it.
- Connect the cable extremity to J23 or J24.
- The Extension Module will be powered by 12VDC provided by CCU. No need for an external power supply.

- See the appropriate section of this manual for connection details.
- Feed auxiliary equipment supply cables through a compression gland into the Extension Module.
- Switch the CCU ON.

Outputs (relays) table:

<table>
<thead>
<tr>
<th>Function</th>
<th>Relay Label</th>
<th>Relay ID</th>
<th>Connector</th>
<th>Rating</th>
<th>Examples of possible use</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUX</td>
<td>AUX8</td>
<td>K1</td>
<td>J2</td>
<td>6A/24V</td>
<td>Pool heating, booster pump, Garden lighting, irrigation, etc.</td>
</tr>
<tr>
<td>AUX</td>
<td>AUX9</td>
<td>K2</td>
<td>J2</td>
<td>6A/24V</td>
<td>Pool heating, booster pump, Garden lighting, irrigation, etc.</td>
</tr>
<tr>
<td>AUX</td>
<td>AUX10</td>
<td>K3</td>
<td>J2</td>
<td>6A/24V</td>
<td>Pool heating, booster pump, Garden lighting, irrigation, etc.</td>
</tr>
<tr>
<td>AUX</td>
<td>AUX11</td>
<td>K4</td>
<td>J2</td>
<td>6A/24V</td>
<td>Pool heating, booster pump, Garden lighting, irrigation, etc.</td>
</tr>
<tr>
<td>AUX</td>
<td>AUX12</td>
<td>K5</td>
<td>J1</td>
<td>6A/24V</td>
<td>Pool heating, booster pump, Garden lighting, irrigation, etc.</td>
</tr>
<tr>
<td>AUX</td>
<td>AUX13</td>
<td>K6</td>
<td>J1</td>
<td>6A/24V</td>
<td>Pool heating, booster pump, Garden lighting, irrigation, etc.</td>
</tr>
<tr>
<td>AUX</td>
<td>AUX14</td>
<td>K7</td>
<td>J1</td>
<td>6A/24V</td>
<td>Pool Cover open command (*), Pool heating, booster pump, Garden lighting, irrigation, etc.</td>
</tr>
<tr>
<td>AUX</td>
<td>AUX15</td>
<td>K8</td>
<td>J1</td>
<td>6A/24V</td>
<td>Pool Cover close command (*), Pool heating, booster pump, Garden lighting, irrigation, etc.</td>
</tr>
</tbody>
</table>

(*) see extras functionalities in 5.6.6 Equipment.
WARNING:
Never exceed the power ratings.
Always conform to local installation norms and requirements.

CAUTION:
If you are unsure of the applicable wattage rating, contact the distributor of the auxiliary apparatus to confirm prior to connection.

Inputs table:

<table>
<thead>
<tr>
<th>Function</th>
<th>Input Label</th>
<th>Connector</th>
<th>Examples of possible use</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT</td>
<td>IN3-GND</td>
<td>J11</td>
<td>Consumables low, pump start, pump stop, pool cover, etc.</td>
</tr>
<tr>
<td>INPUT</td>
<td>IN4-GND</td>
<td>J11</td>
<td>Consumables low, pump start, pump stop, pool cover, etc.</td>
</tr>
<tr>
<td>INPUT</td>
<td>IN5-GND</td>
<td>J11</td>
<td>Consumables low, pump start, pump stop, pool cover, etc.</td>
</tr>
<tr>
<td>INPUT</td>
<td>IN6-GND</td>
<td>J11</td>
<td>Consumables low, pump start, pump stop, pool cover, etc.</td>
</tr>
<tr>
<td>INPUT</td>
<td>IN7-GND</td>
<td>J12</td>
<td>Consumables low, pump start, pump stop, pool cover, etc.</td>
</tr>
<tr>
<td>INPUT</td>
<td>IN8-GND</td>
<td>J12</td>
<td>Consumables low, pump start, pump stop, pool cover, etc.</td>
</tr>
<tr>
<td>INPUT</td>
<td>IN9-GND</td>
<td>J12</td>
<td>Jetstream control (*), Consumables low, pump start, pump stop, pool cover, etc.</td>
</tr>
<tr>
<td>INPUT</td>
<td>IN10-GND</td>
<td>J12</td>
<td>Consumables low, pump start, pump stop, pool cover(*), etc.</td>
</tr>
</tbody>
</table>

Table 5 Inputs Table

CAUTION:
Inputs are self-powered with low voltage.
Only use potential free signal without any external power supply.

(*) see extras functionalities in 5.6.6 Equipment

3.7.3 Connecting an Automatic Backup Valve in the Waste Line

An external valve can be added to the waste line to avoid loss of water when the multiport valve is rotating. This is especially useful when the pump house is above the water line. The valve must be controlled via the AUX5 relay and must be appropriately programmed in the “Filter Data” section.

Use a 24VAC solenoid valve of the right diameter; these valves are available from PoolCopUSA. 24VAC supply is available in the CCU.
3.7.4 Connecting Equipment

3.7.4.1 Connecting a Pool Cover

A pool cover control functionality is available in Equipment settings (see 5.6.6 Equipment for further details). To achieve remote control, a compatible pool cover drive unit must be connected to the XM8 Extension Module. Pool Cover will be operated by “pulsing” the Open command or Close command to the drive. Basically, the operating mode will be able to replace the genuine button or key operated command.

**WARNING:**
Remote control of a pool cover can cause severe injury. The user MUST ALWAYS have the pool in direct view when maneuvering the cover and during opening or closing operations.
- The pool must be monitored at all times during the operation of the pool cover to ensure that no person is in the pool or enters the pool.
- The remote control of the pool cover is reserved for maintenance operations carried out by an authorized technician.

**NOTE:**
Refer to the Pool Cover manufacturer wiring diagrams to wire properly the signals.
- Aux14 is open command, Aux 15 is close command and In10 is closed position contact.

![Pool Cover Connection (Control and Position Indication)](image)

3.7.4.2 Connecting a Jetstream Pump

A Jetstream pump is usually operated with a pneumatic push button in the pool. If the push button is connected to the XM8 Extension Module, Jetstream will also be operable remotely and user will be able to choose a running duration (see 5.6.6 Equipment for further details).

![Jetstream Connection](image)
NOTE:
Push button signal must be converted in ON/OFF contact before being connect to Extension Module. This is usually done by a pneumatic switch inside the Jetstream electric junction box. Aux13 is Jetstream pump command.

3.8 COMPLETING THE INSTALLATION
- Verify that all wiring has been done according to applicable electrical norms.
- Replace the battery and connect the terminal cables. Verify polarity.
- Verify that the pH+ORP electrode or blanking plug is secure, with O-Ring in place.
- Verify that the power switch on the CCU is in the OFF position.
- Connect the circuit breakers to the CCU and associated equipment.

3.9 COMMISSIONING POOLCOP
- Switch the CCU ON.
  - The Power ON and Battery ON LED’s must illuminate.
  
  CAUTION:
  If this equipment stays on for longer than 2 seconds, IMMEDIATELY switch OFF the CCU. Recheck all connections. If only the pump runs, disconnect the circuit breaker, switch ON the PoolCop and reset factory default settings. Now reconnect the pump circuit breaker and continue with commissioning.

- The PoolCop will display the following sequence:
  - Welcome note with firmware version (5 seconds).
  - Pump OFF.
  - Position FILTER (the valve may rotate to FILTER position before this is displayed if it was not already in this position).
  - Once FILTER position is confirmed, the main screen will be displayed.
- Open all appropriate valves and remove any plugs in the filtration system.
  
  CAUTION:
  If leaks are found, switch OFF the CCU. Repair all leaks and repeat the procedure, if required.

- Switch the pump ON from the MANUAL CONTROL menu.
- With the pump and filtration running, carefully check for leaks, especially in the following places:
  - pH+ORP sensor or blanking plug.
  - Seal between VDU base and/or 2" Adapter and the multiport valve housing.
  - Filter connectors.
  - All valves and pipe connectors.
- Verify correct functioning of auxiliaries by switching them ON/OFF in the MANUAL CONTROL menu.
- Close the CCU cover and secure with 4 tamper proof screws.
3.10 **Post Installation Inspection, Documentation, Procedures**

### 3.10.1 Post Installation Inspection

After completing the installation, the installer will:

- Verify that all the wiring is neat and safe.
- With the system running, verify no water leaks.
- Verify that the water balance is in the acceptable range.
- Verify correct functioning of the equipment and peripherals, including the pool light.

### 3.10.2 Post Installation Documentation

Complete the Configuration Card (section 2.4).
Complete the product warranty registration card.

### 3.10.3 Post Installation Procedures

Ensure that the client has a broad knowledge of the installation, understands the functions of the PoolCop and the alerts:

- Introduce system and point out main components and their functions.
- Explain basic system operation, using the User Guide.
- Explain that once the water is balanced, the PoolCop takes over the filtration and other functions as installed within normal parameters.
- Remind the owner that the PoolCop is a management system, not a repair system. Events outside of the norm may require intervention and water balance.
- Show Air Temperature Sensor location (if installed)
- Show the Water Level Control (if installed):
  - Sensor location and cable routing.
  - Position and use of the water supply shut-off.
  - Pipe routing of the water supply.
- Show water treatment options and consumables (if installed).
- Show auxiliary equipment connected (if installed).
- Show inputs connected (if installed).
- Explain the water treatment options as installed, including the verification of consumables.
- Hand over completed User Guide.
<table>
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<th>Section 4</th>
<th>USER GUIDE</th>
</tr>
</thead>
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</table>
PoolCop has been designed to relieve much of the burden and cost of pool maintenance, whilst reducing the cost and requirement for chemical products. The pool will be a healthier swimming environment.

PoolCop is not a repair system. Pay prompt attention to any Alerts. In the unlikely event of malfunctions call a qualified technician. Following the guidelines in this manual and maintain the equipment in accordance with the maintenance schedule to ensure trouble free operation and an easily maintained swimming pool.

### 4.1 PoolCop Configuration

The equipment will be programmed by a qualified technician.

Complete the Configuration Card with programming and setup details.

### 4.2 Keypad and Display Layout

![VDU Display and Keypad](image)

*Figure 55 - VDU Display and Keypad*
4.3 Menus

- Manual Control
  - Pump
  - Auxiliaries
  - Adjust level
  - Clean Filter
  - Valve Rotation
  - Equipment
- Filtration Modes
- Auxiliaries
- Water and Treatment
  - Water Level
  - pH Control
  - ORP Control
  - Remnant Injection
- Maintenance
  - Temp. adjustment
  - Air Antifreeze
  - Service Mode
  - Stop Treatment
  - Measure pH
  - Calibrate pH
- Configuration
  - Pool Data
  - Pump Data
  - Filter Data
  - Inputs
  - Factory Settings
  - Equipment
4.3.1 Manual Control

- **Pump**
  - **Switch Pump ON or OFF**
    - Manually switch the pump ON or OFF at any time (if no freeze conditions) in the current valve position.
  - **Change Pump Speed**
    - The programmed pump speed can be changed manually for the rest of the filtration cycle. Programmed speed will revert for the next cycle.
    - **REQUIRES PUMP TYPE SET TO A VARIABLE SPEED PUMP.**

- **Auxiliaries**
  - **Switch ON or OFF**
    - Manually switch auxiliary equipment ON or OFF at any time, regardless of the **SLAVED: YES/NO** configuration.

- **Level Adjust**
  - **Get water level**
    - Ask for water level update which can lead to water refill or a level reduction. Will stop refilling when refill is ON.
    - **REQUIRES WATER LEVEL CONTROL INSTALLED.**

- **Clean Filter**
  - **Command Cleaning Cycle**
    - Stops the pump (if ON) and carries out complete cleaning cycle (backwash and rinse) at any time.
    - **NOT AVAILABLE WITH CLEAN INHIBITED IN FILTER DATA MENU.**

- **Valve Rotation**
  - **Filter**
    - Stops the pump (if ON) and manually rotates the valve to FILTER position at any time.
  - **Waste**
    - Stops the pump (if ON) and manually rotates the valve to WASTE position at any time.
  - **Closed**
    - Stops the pump (if ON) and manually rotates the valve to CLOSED position at any time.
  - **Backwash**
    - Stops the pump (if ON) and manually rotates the valve to BACKWASH position at any time.
    - **NOT AVAILABLE WITH AUTO CLEAN INHIBITED.**
  - **Bypass**
    - Stops the pump (if ON) and manually rotates the valve to BYPASS position at any time.
  - **Rinse**
    - Stops the pump (if ON) and manually rotates the valve to RINSE position at any time.
    - **NOT AVAILABLE WITH AUTO CLEAN INHIBITED.**

- **Equipment**
  - **Command Equipment**
    - Manually command equipment such as pool cover or Jetstream pump.
### 4.3.2 Filtration Modes

Program filtration timers and duration, manually or in automatic modes.

Whenever quitting the **Filtration Modes** menu, PoolCop checks and adjust the status of the pump and auxiliaries, and switches them **ON** or **OFF** as required to match programmed run times.

- **Stopped**
  - Cycle1 = 00:00-00:00
  - Cycle2 = 00:00-00:00

- **Timer**
  - Cycle1 = xx:xx - xx:xx
  - Cycle2 = xx:xx - xx:xx

- **ECO+**
  - Cycle1 = xxx-xxx
  - Cycle2 = xxx-CALC

- **Volume**
  - Cycle1 = xxx-xxx
  - Cycle2 = xxx-CALC

- **Continuous**
  - Cycle1 = xxx-CALC
  - Cycle2 = CALC-CALC

- **Force 24H**
  - Cycle1 = CALC-CALC
  - Cycle2 = xxx-yy:yy

- **Force 48H**
  - Cycle1 = CALC-CALC
  - Cycle2 = xxx-yy:yy

- **Force 72H**
  - Cycle1 = CALC-CALC
  - Cycle2 = xxx-yy:yy

---

Filtration is stopped. Both Cycle1 and Cycle2 timers are set to 00:00-00:00.

Cycle1 is free to be set at any value you may choose. Make sure there is at least 30 min break between Cycle1 and Cycle2.

Cycle2 is free to be set at any value you may choose. Make sure there is at least 30 min break between Cycle1 and Cycle2.

Cycle1 is free to be set at any value you may choose.

Choose Cycle2 start time, duration is calculated in accordance with pool needs based on temperature. Cycle1 duration is taken into account.

Cycle1 is free to be set at any value you may choose.

Choose Cycle2 start time, duration is calculated in accordance with pool needs based on turnovers. Cycle1 duration is taken into account.

Choose Cycle1 start time. Cycle1 and Cycle2 duration are 11:30min fixed value allowing a 23 hour per day filtration duration.

Filtration will run 23 hours for a 24 hours period and revert back to normal filtration times. Cycle1 timer settings will be changed when entering the forced mode and restored at the end of period.

Filtration will run 23 hours for a 48 hours period and revert back to normal filtration times. Cycle1 timer settings will be changed when entering the forced mode and restored at the end of period.

Filtration will run 23 hours for a 72 hours period and revert back to normal filtration times. Cycle1 timer settings will be changed when entering the forced mode and restored at the end of period.
4.3.3 Auxiliaries

Program auxiliary timers and set them as slaved to run with the pump only, or on specific day. Whenever quitting the AUXILIARIES menu, PoolCop checks and adjust the status of the pump and auxiliaries and switches them ON or OFF as required to match programmed run times.

AUX channels operate in the same manner, but some channels may be required for specific functions.

Note: Aux 8 to Aux 15 only available with PoolCop Extension Module.
4.3.4 Water and Treatment

View and adjust various water level and treatment options available.

- **Water Level**
  - Installed
  - Refill Mode
  - Refill Continuous
  - Max Duration
  - Draining

Set the parameters for automatic pool refill and level reduction.

- **pH Control**
  - Installed
  - pH Mode
  - Setpoint
  - Max Dosing
  - Priming

Set parameters for pH Control.

- **ORP Control**
  - Installed
  - Disinfectant type
  - Setpoint
  - BOOST day
  - BOOST to Priming

Set parameters for ORP Control.

- **Remnant Injection**
  - Installed
  - Aux Channel
  - Injection rate
  - Temp adjust
  - Extra adjust priming

Set parameters for remnant injection.
### 4.3.5 Maintenance

- **Temp Adjustment**
  - Adjust Water Temperature

- **Air Antifrz**
  - Air temperature to start antifreeze protection

- **Service Mode**
  - Activate/deactivate service mode

- **Stop Water Treatmt**
  - Low water temperature to stop water treatment

- **Measure pH**
  - Measure pH

- **Calibrate pH**
  - Calibrate pH

### 4.3.6 Configuration

- **PoolData**
  - Set pool data parameters used to calculate filtration duration

- **Pump Data**
  - Set pump data parameters used for alerts and pump protections

- **Filter Data**
  - Set filter data parameters used to configure functions

- **Inputs**
  - Set function and action and alarm for each input

- **Factory Settings**
  - View Network settings

- **Equipment**
  - Set date and time

- **Network**
  - Select the language

- **Date/Time**
  - Reset to the default settings

- **Language**
  - Set the Pool Cover control

- **Reset**
  - Set the Jetstream control

- **PoolCover**
  - Reserved
4.4 USING AND SETTINGS

4.4.1 Illuminate the Backlight

Pressing any button illuminates the backlight. The backlight remains on for 3 minutes.

Note:
- Water temperature and air temperature are shown alternatively on the same row.
- An Up or Down blinking arrow may appear on the right of pH value: this will be the case if:
  - pH is controlled by PoolCop (pH control is installed and pH type is pH+ or pH-).
  - Up arrow: pH value is more than 0.1 above setpoint (ex pH=7.2, Setpoint=7.0)
  - Down arrow: pH value is more than 0.1 below setpoint (ex pH=7.2, setpoint=7.3)
- An Up or Down blinking arrow may appear on the right of ORP value: this will be the case if:
  - ORP is controlled by PoolCop (ORP control is installed and ORP type is different from “Read”).
  - Up arrow: ORP value is more than 50mV above setpoint (ex ORP=690, Setpoint=635mV)
  - Down arrow: ORP value is more than 50mV below setpoint (ex ORP=690, setpoint=735mV)

4.4.2 Navigate the Menu

Press the MENU button.
POOLCOP MENU is displayed.
Use the UP and DOWN buttons to choose the submenu (in this case Manual Control), then press SELECT to go to that submenu.
Repeatedly pressing QUIT to retron to the main display.

4.4.3 Return to Main Display

When viewing any menu screen:
- Press QUIT to go up one menu level.
- Every display has a 15 second timeout to go back to the previous menu. The display will timeout to the main display within approximately 1 minute.
4.4.4 Filtration and Pump Control

4.4.4.1 Switch the Pump ON/OFF

4.4.4.1.1 Start the Pump

Normally, the filtration pump is controlled automatically by PoolCop using filtration in manual timer or automatic modes. If, however you want to run the pump at another time or need to restart the pump after stopping it for any reason, this is done from MANUAL CONTROL.

From the main display screen:
- Press MENU.
- Press SELECT (MANUAL CONTROL is preselected).

Press SELECT (PUMP is preselected).
- Verify FILTER position is displayed.
- Press SELECT (PUMP is preselected).
- Press SELECT; PUMP: ON will display.
- Press SELECT; the pump will run in the indicated valve position.
- Once the pump starts system pressure increases and this will be displayed.

CAUTION:
If the valve is in position Waste, Backwash or Rinse, pool water level will reduce.

NOTE:
If the valve is Closed, pump will not be allowed to start.
4.4.4.1.2 Stop the Pump

- Navigate to pump **MANUAL CONTROL**.
- The pump will be **ON**, and pressure will be displayed.
- Press **SELECT** (**PUMP** is preselected).
- Press **SELECT; PUMP: OFF** will display.
- Press **SELECT**. The pump will stop, and pressure will reduce.

**NOTE:**
If the pump and filter are lower than the pool water level, head pressure will be displayed otherwise pressure will be zero.

**NOTE:**
When freezing risk is detected and filtration started, the pump CANNOT be stopped until the temperature detected is higher than the protection setting, or the Protection Antifreeze is switched OFF in the Pool Data menu.

4.4.4.1.3 Change the Pump Speed

This feature is available with variable speed pumps only; for configuration see the **PoolCop Variable Speed Pump Guide**. Pump speed is linked to filtration and Filter Cleaning Cycles; the speed can be changed by the user with the pump **ON** and this speed will be maintained until the next programmed Filtration Timer cycle commences or until the next filter cleaning cycle starts.

- Navigate to **MANUAL CONTROL** (**PUMP** is preselected).
- Press **SELECT**; Pump Manual Control displays.
- Select **SPEED**.
- Press **SELECT** and scroll **UP or DOWN** to select desired speed.
- Press **SELECT** to activate the speed.

**NOTE:**
The number of speeds available depends on the pump specifications. PoolCop sends the corresponding speed signal to the pump; due to pump design and features there can be a delay between selecting the speed and the pump reacting.
4.4.4.2 Manual Valve Control

Valve positions can be selected manually as required. The pump is automatically stopped when a new valve position is selected to allow valve rotation. Filtration programming always has priority over a manually selected valve position. If left in any position except FILTER, when the next filtration cycle is activated, the pump will stop if ON, and the valve will rotate to FILTER position, and then the pump will run the programmed filtration cycle.

- Press **MENU**: POOLCOP MENU displays (MANUAL CONTROL preselected).
- Press **SELECT**: MANUAL CONTROL displays.
- Scroll **UP** and **DOWN**: place cursor at VALVE ROTATION.

- Press **SELECT**: VALVE ROTATION displays.
- Scroll **UP** and **DOWN**: place cursor at desired valve position.
- Press **SELECT**: the pump will stop if ON, and the valve will be rotated to the desired position.
- The pump can now be started as required from the **PUMP** menu.

![Manual Valve Control](image)

**WARNING:**

In positions Waste, Backwash or Rinse, pool water level will reduce. Water level will continue to reduce until the pump is stopped manually, the next filtration cycle starts or pump loose its prime. Before draining water or reducing level, establish that the quantity of water evacuated poses no risk.

4.4.4.3 Carry out a Clean Filter Cycle

Proper filter cleaning ensures that the filter operates very near optimum efficiency; this ensures a clean, healthy pool and greatly reduces running costs. Properly programmed, PoolCop will clean the filter when required.

- To carry out additional Clean Filter Cycles, navigate to **MANUAL CONTROL**.
- Scroll **UP and DOWN** to place cursor at CLEAN FILTER.
- Press **SELECT**: a confirmation screen displays.
- Press **SELECT** again, and a filter cleaning cycle will be carried out.

PoolCop now automatically controls the pump and filter system to carry out a backwash and a rinse cycle based on settings programmed. The display will show progress and pressures as PoolCop cleans the filter automatically. Once the cycle is complete, the system returns to normal operation.

During the **BACKWASH** phase, to advance to **RINSE** prior to expiration of the programmed duration, press the **RINSE** button.

During the **BACKWASH** phase, the cycle can be interrupted by pressing the **QUIT** button.

During the **RINSE** phase, to terminate the cycle prior to expiration of the programmed duration, press the **QUIT** button.

If filtration was running before cleaning, the pump will automatically switch ON when the filter cleaning cycle completes to resume filtration cycle.
4.4.4.4 Understanding Pump Modes

On the PoolCop main display, next to **Pump** you will see the **mode** in which the pump and filtration are running, or **OFF**. The mode that has started and/or is now causing the pump to be on will be displayed. In this example, the pump is filtering in **AUTO** (see below) and a pressure of 0.98 Bar is displayed.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Valve Positions</th>
<th>What’s happening now?</th>
<th>Water Treatment</th>
<th>What will happen next?</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOP</td>
<td>All</td>
<td>The filtration pump is OFF. No filtration cycles are defined.</td>
<td>OFF</td>
<td>The filtration will remain OFF as long as there is no filtration cycle or no manual command to start the pump.</td>
</tr>
<tr>
<td>MAN</td>
<td>All</td>
<td>The pump was started by the user, or by the external run pump command, and is running outside a programmed timer period. Or Pump is running inside a filtration cycle, but valve is not in filter position.</td>
<td>OFF</td>
<td>PoolCop will revert to the programmed filtration cycles (including repositioning the valve to FILTER) when the next timer starts.</td>
</tr>
<tr>
<td>TIMER</td>
<td>Filter</td>
<td>Filtration was started by or has now entered a Filtration Timer cycle using user programmed timer settings in Cycle 1 and/or Cycle 2 in <strong>TIMER</strong> mode.</td>
<td>Active</td>
<td>PoolCop will use fixed programmed timer settings to start and stop the filtration.</td>
</tr>
<tr>
<td>AUTO</td>
<td>Filter</td>
<td>Filtration was started by or has now entered the Filtration Timer cycle and is in an automatic mode (either <strong>ECO+</strong>).</td>
<td>Active</td>
<td>PoolCop is optimizing the filtration duration based on measured temperature, as well as pool and pump data settings.</td>
</tr>
<tr>
<td>FORCE</td>
<td>Filter</td>
<td>Filtration is in Mode Forced, which was selected by the user in Manual Operations.</td>
<td>Active</td>
<td>Filtration will run for 23:00 per day for the duration selected (24, 48 or 72 hours). PoolCop will then revert to the programmed filtration cycles (including repositioning the valve to FILTER) when the next timer starts.</td>
</tr>
<tr>
<td>FRZ</td>
<td>Filter</td>
<td>PoolCop is detecting a freezing risk and is running the filtration to use warmer water from the pool to reduce the risk of the pool or equipment freeing.</td>
<td>Active</td>
<td>30min after freezing risk has cleared, PoolCop will revert to the programmed filtration cycles when the next timer starts.</td>
</tr>
<tr>
<td>PAUSE</td>
<td>All</td>
<td>Filtration is momentarily stopped because a filtration cycle ends or a manual command or an event stopped the pump.</td>
<td>OFF</td>
<td>Filtration will automatically restart with the next filtration cycle.</td>
</tr>
<tr>
<td>EXT</td>
<td>Filter</td>
<td>Filtration has been started because of an external request (an input is configured to fulfill this behavior).</td>
<td>OFF</td>
<td>Filtration will be running as long the external request is present, although it will respect the 2 x 1/2h pause per day.</td>
</tr>
<tr>
<td>LVL</td>
<td>Filter</td>
<td>Filtration has been started because of Very high level in buffer tank (infinity pools only).</td>
<td>OFF</td>
<td>Filtration will be running until a water level reduction is activated.</td>
</tr>
</tbody>
</table>
**4.4.4.5 Filtration Duration Guidelines**

Filtration is the first vital step in managing a pool. Good filtration (the filter and media in good condition and adequate filtration duration) reduces the organic matter and nutrients in the pool water and allows for stable and predictable water treatment (pH and disinfection). Poor filtration means that even high levels of chemical treatment may be unable to maintain the pool water in safe and healthy condition.

<table>
<thead>
<tr>
<th>NOTE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is recommended to keep at least 60min of free time (no filtration) per day. This will permit pH measurement, periodic filter cleaning, and automatic pool refill if installed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOTE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water treatment (pH and disinfection) will only run if filtration cycles are programmed with at least one of the two filtration cycles set to an appropriate duration.</td>
</tr>
</tbody>
</table>

**4.4.4.5.1 Filter and Media**

Ensure that manufacturer guidelines are followed for the chosen filter and media. Filter and filtration media in poor condition reduce filtration efficiency and increase running cost, whilst risking health due to algae and bacterial growth. Renew or clean the filter media periodically, as recommended by the manufacturer.

**4.4.4.5.2 Hydraulic Coefficient**

Adequate filtration depends on the hydraulic coefficient of the filtration.

\[
\text{Hydraulic Coefficient} = \text{Pool Volume} / \text{Filtration Rate Per Hour}
\]

Filtration Rate per Hour is the actual rate of filtered water returning to the pool.

In a correctly designed swimming pool, the hydraulic coefficient will be 4 to 6; a coefficient lower than 4 results in increased energy costs and a coefficient over 6 can result in inadequate filtration. This coefficient can be compensated if above 6 by adding filtration duration.

When calculating filtration duration in all automatic modes, PoolCop takes the hydraulic coefficient into account and adjusts the filtration duration accordingly.

**4.4.4.5.3 Timer based Filtration**

In **TIMER** mode, filtration durations are not managed by PoolCop but chosen by the end user who must then make sure to correctly set the duration according to pool needs. A too long duration will waste energy and a too short one may not allow to keep the pool in good conditions.

**4.4.4.5.4 Temperature Based Filtration**

In **ECO+** mode, PoolCop uses measured temperature to calculate filtration duration. Duration is recalculated daily to optimize filtration:

- Great savings can be made in the off seasons by reducing filtration duration during the cooler months.
- Increased water temperature requires longer filtration time. So, during summer the filtration time is increased, which is very effective at eliminating nutrients which cause bacteria and algae to proliferate.
- Pump (and other equipment) life expectancy is extended, as use and wear is minimized.

**4.4.4.5.5 Volumetric Based Filtration**

The filtration duration must circulate the pool water at least once during a day.

When automatically calculating filtration duration in **VOLUME** mode, PoolCop takes entered volumetric turnover data (Pool Volume, Flow Rate, Turnovers) into account and adjusts the filtration duration accordingly.

**4.4.4.5.6 Continuous Filtration**

With multi speeds pumps and especially when pump is running at low speed, it makes sense to set the filtration to 23 hours per day in such a case, the filtration is not managed by changing the duration but by adjusting pump speed. In **CONTINUOUS** mode, filtration will run 23/24.
4.4.4.5.7 Forced Filtration: 24h, 48h or 72h

PoolCop normally runs on timers and on automatic modes, adjusting the filtration duration as required. When required however, forced running of the pump in FILTER can be selected. This allows a fixed length filtration duration which is useful under certain conditions.

**FORCED** mode changes Filtration Timer Cycle 1 times. When the forced duration is completed, previous settings for Cycle 1 are restored. This mode does not affect Cycle 2 settings.

**FORCED** mode is only available for the valve position FILTER; activating the mode will reposition the valve to FILTER.

In **FORCED** mode, the maximum daily duration is limited to 23:00; with either one or two stopped periods to allow for PoolCop measurement functions and daily self-test to occur. Normal automatic filter cleaning may occur during **FORCED** mode. Water treatment is active during this mode.

The time remaining in Forced mode is displayed in whole hours on the pump Manual Control screen and on Filtration Mode screen. Any active forced filtration mode is deactivated when the duration has expired, and the Filtration Timer cycles will resume normal control as programmed.

**FORCED** mode can be cancelled by stopping the pump manually or by changing the **filtration mode**.

Stop the Pump

- Navigate to **PUMP** in the **MANUAL CONTROL** menu.
- The pump will be ON, and pressure will be displayed.
- Press **SELECT** (**PUMP** is preselected).
- Press **SELECT** (**PUMP: OFF**) will display.
- Press **SELECT**. The pump will stop, and pressure will reduce.

Mode Change

- Navigate to **MODE** in the **FILTRATION MODES** menu.
- The mode will be **FORCE**, remaining time (18 Hours here) and the return mode (**ECO+** here) will be displayed.
- Press **SELECT** (**MODE** is selected).
- Use the ARROWS to change mode.
- Press **SELECT** to validate the new mode.

**NOTE:** Forced mode is not cancelled during automatic or user launched Filter Cleaning Cycles.

4.4.4.6 Set and Adjust Filtration

PoolCop allows you to manually or automatically control the filtration duration, using two daily cycles. See programming guide (Section 4) for more information on filtration.

Whenever quitting the **FILTRATION MODES** menu, PoolCop checks and adjust the status of the pump and auxiliaries and switches them **ON** or **OFF** as required to match programmed run times.

4.4.4.6.1 Filtration Timers and Modes

- Navigate to **FILTRATION MODES** in the **POOLCOP MENU**.
- Select the **MODE**.
- Use the **UP** and **DOWN** arrows to adjust the **ON** and **OFF** times.
- Use the **SELECT** button to enter the adjusted value.

It is recommended to set both filtration cycles (Cycle 1 and Cycle 2) for best results.
It is recommended to leave a gap of at least 30 minutes between two timer cycles to allow PoolCop to take necessary measurements make subsequent adjustments and carry out the periodic backwash if selected.

If, however the timers are set to overlap, then the total filtration time will be from the earlier cycle ON time until the later timer OFF time.

It is recommended to never exceed 23:00 per day, to allow PoolCop to take necessary measurements, make subsequent adjustments and carry out the periodic backwash if selected.

4.4.4.7 Antifreeze Protection

The internal antifreeze protection will start the filtration if low temperatures are detected. This protects me in areas where running the pool all year round is possible and protects against short periods of cold weather. Protection Antifreeze can be configured ON in the POOL DATA menu (the default is ON).

Freezing presents risks to pools and pool equipment. Expansion of the water as it moves from the liquid to the solid state can crack pipes and burst fittings, as well as the filter and the pump body.

PoolCop has two means of detecting a freezing risk. It is recommended that BOTH freezing protections be utilized, and that freezing protection be selected ON in the POOL DATA menu throughout the year.

CAUTION:
PoolCop freezing protections can only assist in the protection of equipment. PoolCop cannot guarantee that damage will be avoided under all circumstances, as this depends on many factors. No responsibility will be accepted for damage caused due to freezing.

NOTE:
When freezing risk is detected and filtration is started, the pump CANNOT be stopped until the temperature detected is higher than the protection setting, or the Protection Antifreeze is switched OFF in the Pool Data menu.

4.4.4.7.1 Internal Freezing Protection (for Equipment)

Internal temperature sensing detects low temperature and starts the filtration to move warmer water from the pool through the plumbing to reduce the risk of damage due to freezing, if the protection is ON. This protects equipment in the pump and filter area to a certain degree.

If the PoolCop temperature sensor, installed in the multiport valve housing, detects a temperature < 2°C, the Alert "WARN: FREEZING RISK" will display if freezing protection is OFF, or freezing protection will be activated if freezing protection is ON in POOL DATA menu. The filtration will run at all times that the temperature is less than 2°C, and will continue for a period of 30 minutes after the temperature rises above 3°C.

4.4.4.7.2 External Freezing Protection (for the Pool)

There can be great differences in temperature between the pump and filter installation and the pool itself. The optional Air Temperature Sensor is highly recommended so that external air temperature can be used to alert to the risk of freezing and start filtration.
If the optional Air Temperature Sensor is fitted, measured temperature is used to trigger antifreeze protection when temperature is below the desired setting (see 5.5.2 Air Anti-Freeze). The Alert “WARN: FREEZE RISK” will display if protection is OFF, or freezing protection will be activated if freezing protection is ON in POOL DATA menu. The filtration will run at all times that the temperature is below the threshold and will continue for a period of 30 minutes after the temperature rises above the threshold.

Alternatively, an external thermostat can be installed and connected to an input channel so that external air or water temperature can be used to alert to the risk of freezing and start filtration. When an external thermostat sensor is connected and configured on one of the inputs and detects a temperature lower than the thermostat settings, the Alert “WARN: FREEZE RISK” will display if protection is OFF, or freezing protection will be activated if freezing protection is ON in POOL DATA menu. The filtration will run at all times that the temperature is less than the trigger temperature set on the external thermostat and will continue for a period of 30 minutes after the temperature rises above the set trigger temperature.

4.4.5 Water Level Control

4.4.5.1 Automatic Water Level Control
The optional Water Level Kit is required for automatic water level control. The water level controller measures the level when the filtration stops. The water level will be replenished automatically when LOW level is detected provided that REFILL MODE is set to REFILL or AUTO. The water level controller will only replenish whilst the pump is OFF. When the pump starts the valve closes automatically unless continuous filling has been selected. To allow water level measurement, pump should be stop at least 30 minutes between each filtration cycle.

The water level will be reduced automatically when V.HIGH (very high) level is detected provided that REFILL MODE is set to REDUCE or AUTO. With filter CLEANING: AUTO, cleaning cycles will be commanded to reduce the level; with cleaning INHIBITED or MANUAL, the water is sent to waste.

4.4.5.2 Refill Pool Manually

- If running, stop the pump in MANUAL CONTROL.
- In the MANUAL CONTROL menu, select ADJUST LEVEL.
- Press SELECT, then after level reading:
  - If level is NORMAL or LOW, the pool refills.
  - If level is HIGH nothing will happen
  - If level is V.HIGH a water level reduction may occur within 15 minutes

When water refill is ongoing, blinking vertical arrows are shown on the main screen, close to "Level" text. Should the refill have been stopped manually (using Manual control/Pool refill), arrows will be change to dots.

4.4.5.3 Reduce Water Level Manually

CAUTION:
If draining the pool, remember to switch off automatic refill, and close the water supply at the shut off tap prior to draining the pool even partially. Deactivate filtration timers; deactivate periodic filter cleaning mode.
Navigate to **MANUAL CONTROL**
- Scroll UP or DOWN to place cursor at **VALVE ROTATION**.
- Press SELECT; **VALVE ROTATION** will display
- Scroll UP or DOWN to place cursor at **WASTE**.
- Press SELECT, the pump will stop (if ON) and the valve will rotate to the **WASTE** position.

Start the pump.
- Closely monitor water level, closing skimmers and suction points as required.
- Stop the pump when desired water level is attained.

**NOTE:**
With filter type Cleaning: AUTO, it is recommended to use cleaning cycles in Manual Control to reduce water level to economize water consumption.

### 4.4.6 Water Treatment
See 3.5 Water Treatment

### 4.4.7 Auxiliary Control
Auxiliaries have one cycle in every 24-hour period.

Auxiliaries can be set to slave mode i.e. to run only when the filtration runs (with the valve position FILTER or BYPASS). It is recommended to use the slave mode for any auxiliary that depends on filtration flow rate (such as heating, cleaners, water treatment, etc.). See 5.3 Auxiliaries Menu. Auxiliaries can be set to run on certain day(s) of the week. This is done by choosing days **ON** and days **OFF** within the week.

Setting any timer to 00:00-00:00 (or any combination with same start and stop times) deactivates that timer.

Whenever quitting the **AUXILIARIES** menu, PoolCop checks and adjust the status of the auxiliaries, and switches them **ON** or **OFF** as required to match programmed running times.
4.4.7.1 Switch Auxiliaries ON/OFF

☐ Navigate to **MANUAL CONTROL**.
☐ Scroll **UP** or **DOWN** to place cursor at **AUXILIARIES**.
☐ Press **SELECT**.

☐ Scroll **UP** and **DOWN**: place cursor at the desired Auxiliary.
☐ Press **SELECT**: the auxiliary will switch **ON** or **OFF**

---

**NOTE:**
Not defined Auxiliaries cannot be switched ON/OFF.
To set auxiliary name, see 5.3 Auxiliaries Menu

---

If auxiliary is slaved, the pump must be primed before switching the Aux to **ON**. Pump will be declared primed when pump is **ON**, pressure is above the protection pressure setting and flow is detected at the flow switch (see 5.6.2.3 Protection Pressure).

☐ If you want to start the pump, press **PUMP** button to jump to the pump command page, otherwise press **QUIT**.

---

**AUXILIARY SLAVED**

Aux cannot run if
Pressure is lower than
0.20 bar
Start the pump?
### 4.4.8 Equipment Control (requires XM8 Extension Module)

Equipment are specific devices such as Pool Cover, Jetstream.

- Navigate to **MANUAL CONTROL**.
- Scroll **UP** or **DOWN** to place cursor at **EQUIPMENT**.
- Press **SELECT**.

- Scroll **UP** or **DOWN** to select the equipment you want to control (depending on the actual configuration).

#### 4.4.8.1 Pool Cover

- Scroll **UP** or **DOWN** to select the action to be executed.
- Press **SELECT** to launch the command.
- When both commands are **OFF**, the motor is stopped.
- Actual cover position is shown.

#### 4.4.8.2 Jetstream

- Command is preselected
- Press **SELECT** to start or stop the equipment.
4.4.9 Service Mode

In service mode, PoolCop stops all its automatic actions.

Service mode can be activated directly from the main screen by simultaneously pressing the UP and DOWN arrows. Every simultaneous action on both arrows will toggle the service mode.

When in service mode, extra service screens are available. These screens display: Pump and Aux statuses, Inputs statuses, and water level status. To display these screens, press either UP or DOWN arrows. Display will return to main screen after 5 minutes of inactivity.

The first service screen displays pump and Aux statuses.

- Press UP to display Auxiliaries and pump status
- Press QUIT to return to main screen

The second service screen displays inputs statuses.

- Press UP again to display Inputs
- Press QUIT to return to main screen

The third service screen displays water level sensor detail.

- Press UP again to display water level
- Press QUIT to return to main screen

Remember that the water level function requires 4 slots to sense water level (see 3.6.2 Water Level Control). Slots are reported ON when they are in contact with water.

(WL) Low is the second slot starting from bottom.
(WL) High is the third slot starting from bottom.
(WL) Prot is the higher slot.

4.5 Troubleshooting and Alerts
4.5.1 General Troubleshooting

4.5.1.1 Pool Water Quality Not Good
- Refer to 2.4 Routine Maintenance.
- Refer to 3.5 Water Treatment.
- Contact the qualified technician for assistance.

4.5.1.2 PoolCop Unresponsive
If nothing is displayed on the PoolCop screen, check:
- PoolCop responsive to buttons.
- Mains power supply connected and PoolCop switched ON at CCU.
- PoolCop CCU fuses (use 125mA slow blow mini fuse).
- Contact a qualified technician for assistance.

4.5.1.3 pH or ORP Measurement Unstable or Erratic
Unstable readings of pH or ORP can be caused by a number of factors. Check the following:
- Check for stray micro currents.
- Verify sensor condition and age.
- Contact a qualified technician for assistance.

4.5.1.4 Temperature Indicating Unusually High
Temperature indicating high is caused by a short circuit in the temperature sensor.
- This could be caused by corrosion or by humidity in the VDU.
- Check for water in the VDU.
- Contact a qualified technician for assistance.

4.5.1.5 Water Leak Inside VDU
If water is found INSIDE the VDU:
- Check for leaks from the pressure sensor tubes.
- Check for leaks from the pH sensor.
- Check for leaks from the ionizer electrodes or plugs.
- Check if temperature indication is unusually high (see above).
- Contact a qualified technician for assistance.

4.5.1.6 Pool Water Level Low, or Pool Draining
If there is any doubt about the level of the pool water and that the pool may be draining, immediately ascertain the cause:
- Stop filtration.
- Close all valves to prevent further water loss.
- Verify valve position; if not in FILTER, select FILTER in Manual Operations.
- With valve indicated in position FILTER, check waste pipe for water draining out.
- If a manual valve is fitted to the waste pipe, open this to check for draining water.
- If no reason was found, deactivate all timers and contact a qualified technician for assistance.

4.5.2 Electrical Power Failure
PoolCop will automatically detect a mains power supply failure and revert to the safe and low power mode, powered by the backup battery.

4.5.2.1 Main AC Power Fails or is Disconnected
- All functions will be de-activated automatically.
- The valve will rotate to the safe position; this critical security function ensures that the valve will always rotate to a safe position to avoid the possibility of flooding the pump house or draining the pool, even in the event of power failure during valve rotation.
- The display on the VDU will indicate a power failure.
- The “Power ON” LED on the CCU will extinguish.
- The “Battery ON” LED remains illuminated to indicate that the battery is functioning.
- The message “AC Power Failure; PoolCop Deactivated” is displayed.
4.5.2.2 Main AC Power is Restored Within 5 minutes
- PoolCop will immediately reactivate all the functions and timers.
- All parameters will be restored, and no reprogramming of PoolCop is required.

4.5.2.3 Main AC Power is Not Restored Within 5 minutes
- PoolCop will power down completely.
- The display screens will go blank, but no settings will be lost.

When PoolCop detects that the main AC power supply has been restored:
- PoolCop will power up and reactivate all the functions and timers.
- All settings are restored, and no reprogramming of PoolCop is required.
- The saved history of Clean Filter Cycles and Pool Refill are reset to zero.

4.5.3 Alerts and System Messages
An Alert or a System Message is the way PoolCop notifies you of something out of the ordinary. The ALERT button flashes to attract your attention. Alerts can be one of four types:
- REMIND: a task that should be done soon to prevent any deterioration of pool condition.
- WARN: an occurrence or event that needs your attention.
- ERROR: something has gone wrong, but PoolCop is functioning.
- FAILURE: PoolCop has stopped functioning.

Selecting an Alert will allow it to be reset and cancelled, if:
- The alert condition has been rectified.
- The alert condition is not currently active.

An Alert which is still active will re-appear as you leave the alert page, even if reset.

4.5.3.1 Alerts list and troubleshooting

NOTE:
The alerts list, the alerts triggers and the troubleshooting corrective guidelines are detailed in the TROUBLESHOOTING MANUAL downloadable on www.poolcop.com in resources/downloads.

4.5.3.2 View and Reset Alerts

If an alert is active, the ALERT button will flash, the number of active alerts is displayed in brackets.
Pressing the ALERT button will display the alert.

If there are multiple alerts, using the UP and DOWN arrows scrolls through the alert messages.
Pressing the RESET button will reset the displayed alert.
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5.1 PRIOR TO COMMENCING PROGRAMMING

5.1.1 Clean the Filter

Ensure that the filter is properly cleaned. With a sand filter, carry out a Clean Filter Cycle from Manual Operations to enable accurate settings for automated operation. On completion, verify that the valve position is FILTER, and start the pump in Manual Operations. This allows the PoolCop to stabilize pressures and to measure water temperature and other data. The filtration system must run (in FILTER or BYPASS) for at least 10 minutes on first start or after reset to record stable water temperature for automatic filtration duration calculations.

5.1.2 Check Water Level

Refill the pool to the normal level, to ensure accurate pressure and other readings.

5.1.3 Test and Balance Water

It is strongly recommended that the pool water be analyzed and balanced prior to programming any water treatment features.

5.1.4 Understanding Pressure setting parameters

Pressure management is used widely to control filtration management. Settings are defined in:
- Pump Data Menu (see Error! Reference source not found. Error! Reference source not found.)
- Filter Data Menu (see 5.6.3 Filter Data)

![Figure 56 – Pressure setting parameters.](image)

- (1) Protection Pressure (Pump Data) : has two functions:
  - Determine if pump is primed or not. When pressure is below Protection Pressure, pump is not considered as primed. Pump protection will be triggered after 8 minutes if pressure remains below Protection Pressure and if protection is set ON.
  - Allow valve to rotate. Valve rotation will not be allowed or will be interrupted if pressure is above Protection Pressure. This is to protect diffuser against any damage.

- (2) Low Alert Pressure (Pump Data) : An alert will be triggered if pressure is below protection pressure when pump is running. Pump is considered primed but with low efficiency. Alert message ask for baskets and strainer cleaning.

- (3) Normal Pressure : Normal working area of the pump. For best results, pressure must be in this area when filtration is running.

- (4) Filter Cleaning Pressure (Filter Data) : This pressure, if present during 5 minutes, will trigger filter cleaning if enabled or an alert if not.

- (5) High Pressure (Fixed Value) : fixed 1.9bar value to protect pump, filter and other equipment’s in the pump house. This pressure will immediately trip the pump and stop water refill (if any).
5.2 Filtration Mode Menu

Set the duration and times for daily filtration.

The filtration timer has two cycles in any 24-hour period, Cycle 1 and Cycle 2; these cycles are pre-set or are available for any setting depending on the filtration mode selected.

NOTE: It is recommended to keep at least 2x30min of free time (no filtration) per day. This will permit pH measurement, periodic filter cleaning, and automatic pool refill if installed.

5.2.1 Mode

Filtration timer has 8 modes of operation

- In STOP mode, filtration timers are set to 00:00. The filtration will never run in automatic mode.
- In TIMER mode, filtration Cycle 1 and Cycle 2 times are set by the user.
- In ECO+ mode, PoolCop adjusts filtration duration based on measured water temperature, filtration rates, and other factors. This mode allows PoolCop to automatically adjust the filtration duration based on changing seasonal and weather conditions and thus protect water when temperature is high and save energy if temperature is low.
  o Set Cycle 1 as desired. Duration will be taken into account when calculating Cycle 2 duration.
  o Set the Cycle 2 Filtration ON time. PoolCop calculates and sets the OFF time, with X indicated.
  o The duration is automatically calculated based on the average measured temperatures during filtration in the last 24-hour period.
  o Other pool data settings, including pool volume and rate, are used to correct calculated duration to ensure that adequate filtration is carried out daily.
- VOLUME mode is based on the same model as ECO+ Mode with a noticeable difference:
  o In ECO+ Mode, the filtration duration is calculated is made using the pool temperature.
  o VOLUME Mode does not take temperature into account, but simply use the turnover rate defined in the Pool data menu to estimate the filtration time.
- In CONTINUOUS mode, Cycle 1 and Cycle 2 have the same 11:30 duration time so that the global filtration is 23/24. The only available setting is the starting time of Cycle 1.
- In FORCE mode (24H, 48H or 72H) filtration will run 23/24 for the selected period and the will revert back to normal setting. Forced mode is achieved by temporarily setting Cycle 1 timer value so that, added to Cycle 2, the filtration duration is 23 hours. No timer settings are available in Forced mode.
NOTE:
ECO+ Mode uses the daily average water temperature to calculate filtration duration. After a Factory Reset the default filter time is approximately 8 hours, based on an assumed temperature of 20°C. An updated calculation is performed automatically at 17:00.

NOTE:
The first time ECO+ mode is selected, the duration of Cycle 2 will default to 8 hours. Once the filtration has run for approximately 10 minutes an accurate measurement of pool water temperature will enable your PoolCop to update the filtration duration.

5.2.2 Cycle 1 Times
Filtration timer Cycle 1 is used to set fixed duration filtration ON and OFF times. If Cycle 1 OFF time falls within Cycle 2 duration, the filtration will not stop but continue until the end of Cycle 2.

<table>
<thead>
<tr>
<th>Text:</th>
<th>Cycle 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default:</td>
<td>00:00-00:00</td>
</tr>
<tr>
<td>Entries:</td>
<td>00:00-23:59</td>
</tr>
</tbody>
</table>

5.2.3 Cycle 2 Times
Filtration timer Cycle 2 is used to set fixed duration filtration ON and OFF times. If Cycle 2 OFF time falls within Cycle 2 duration, the filtration will not stop but continue until the end of Cycle 1.

<table>
<thead>
<tr>
<th>Text:</th>
<th>Cycle 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default:</td>
<td>00:00-00:00</td>
</tr>
<tr>
<td>Entries:</td>
<td>00:00-23:59</td>
</tr>
</tbody>
</table>
5.3 Auxiliaries Menu

Operation Modes of auxiliaries are related to auxiliary names. Auxiliary timers have one cycle in any 24-hour period.

Whenever quitting the Auxiliaries menu, PoolCop checks the status of the auxiliaries, and switches them ON or OFF as required to match programmed running times.

5.3.1 Auxiliary ID

The default auxiliary ID is the Aux number. Each auxiliary can be renamed for ease of use and identification. The following 15 pre-set names are available for auxiliaries:

<table>
<thead>
<tr>
<th>Text</th>
<th>Default</th>
<th>Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timer</td>
<td>Manual</td>
<td>Timer</td>
</tr>
<tr>
<td>Pulse</td>
<td>Manual</td>
<td>Pulse, Filtration, Priority, Schedule</td>
</tr>
<tr>
<td>Filtration</td>
<td>Manual</td>
<td>Filtration</td>
</tr>
<tr>
<td>Priority</td>
<td>Manual</td>
<td>Priority</td>
</tr>
<tr>
<td>Schedule</td>
<td>Manual</td>
<td>Schedule</td>
</tr>
</tbody>
</table>

NOTE:
On “rimflow” pools (see 5.6.1.6 Pool Type), an auxiliary whose identifier is "Transfer Pump" is considered to be a means of moving the water from the buffer tank to the pool. The pump controlled by this auxiliary will be set ON automatically during the water level control phases in order to produce a change on the water level in the buffer tank.

NOTE:
To change the auxiliary ID, use the up arrow to place the cursor in the title area, then press select to open the scroll list. Use up and down arrow to select the ID label and pre-set select to validate.

5.3.2 “Aux” Mode

Manual mode allows manual ON/OFF commands only. No automatic function will apply.
Timer mode allows to define a start time and a stop time.
Pulse mode allows to manage the ON duration. When the Aux is set ON (manually or automatically) it will revert to OFF after the defined duration.

When auxiliary is set as heating, 3 additional modes are available:
In Filtration mode, the heater can only operate during programmed filtration hours.
In Priority mode, the filtration pump is forced on for priority heating which will accelerate the increase of water temperature.
In Schedule the operation of the heater is limited within the period defined by its own timers. Heating will then only be possible within the defined ON/OFF time range and if the filtration is running.
The table below summarizes the available modes according to the auxiliary’s identifier:

<table>
<thead>
<tr>
<th>Available</th>
<th>Pool Light</th>
<th>Pool cleaner</th>
<th>Pool heating</th>
<th>Disinfection</th>
<th>Salt System</th>
<th>Remnant</th>
<th>Transfer Pump</th>
<th>UV</th>
<th>Spa</th>
<th>Fountain</th>
<th>Bore Hole</th>
<th>Pool House</th>
<th>Garden 1</th>
<th>Garden 2</th>
<th>Garden 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Timer</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pulse</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Filtration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Priority</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schedule</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.3.3 “Aux” Times (Timer Mode)

In Timer mode, set fixed duration with ON and OFF times. Setting any timer to 00:00-00:00 deactivates that timer.

5.3.4 “Aux” Time and Duration (Pulse Mode)

In Pulse mode, define the ON time. ON time set to 00:00 suppresses automatic pulse generation. Aux must be set ON manually and will fall back to OFF automatically after pulse duration.

When in Pulse mode, define the duration, up to 99 minutes and 59 seconds

5.3.5 “Aux” Heating Temperature (Filtration/Priority/Schedule Modes)

Set the desired temperature of water. The temperature will be maintained between 0.0 °C and +0.1 °C of the set point.

5.3.6 “Aux” Slave

Auxiliaries can be set to run only if:

- The pump is primed (SLAVE: PUMP). This is essential for equipment requiring a water flow, such as a robot, water treatment, etc.
- The cover is open (SLAVE: COVER). This function only applies to the pool light.

An auxiliary used as heating is automatically declared slave.

5.3.7 Aux Days of the Week

Auxiliaries can be set to run only on selected days of the week. This is ideal for equipment such as pool cleaners and irrigation, which can be run on specific days of the week.
### 5.4 Water and Treatment Menu

Water level, pH and disinfection settings

<table>
<thead>
<tr>
<th>Water Level Control</th>
<th>pH Control</th>
<th>ORP Control</th>
<th>Remnant Injection</th>
</tr>
</thead>
</table>

#### 5.4.1 Water Level

Set water level control parameters. PoolCop can be configured to automatically refill and reduce water level.

When PoolCop is measuring the water level, the last known value blinks on the screen. No action will be taken as long as the new level is not refreshed (displayed level value will stop blinking). An update is performed every 15 minutes when the pump is stopped.

**NOTE:** Make sure to keep at least 30 minutes between filtration cycles to allow water level to function properly.

#### 5.4.1.1 Installed

With **INSTALLED: YES**, the menu options display and Alerts are activated.

<table>
<thead>
<tr>
<th>Text</th>
<th>Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>NO</td>
</tr>
<tr>
<td>Entries</td>
<td>YES; NO</td>
</tr>
</tbody>
</table>

#### 5.4.1.2 Water Level Control Modes

Water level is updated every 15 minutes when the filtration is stopped.

With mode: **READ**, PoolCop will indicate the water level on the screen but will not take any action to control it. Should the level be LOW or V_HIGH, an alert will be displayed.

With mode: **REFILL**, if the level is LOW the refill system commands the supply valve to open to refill the pool until the HIGH level is detected. If the level is V_HIGH, an alert will be displayed but the level will not be reduced.

If the pump starts during refill, the valve will close, and refilling will be postponed until the next pump OFF period unless **CONT. REFILL: YES**, in which case pool refilling will continue with the pump running.

With mode: **REDUCE**, level will be automatically reduced if V_HIGH. If the level is LOW, an alert will be displayed but pool will not be refilled.

With mode: **AUTO**, control combines **REFILL** and **REDUCE** functionalities.
5.4.1.3 Continuous Refill

This setting is displayed if mode: **REFILL** or **FULL**.
To avoid pool water flowing back in the water supply circuit, pool refill is normally inhibited when the pump is running. During pool refill if the pump is started manually or with a timer or mode, pool refill is suspended until pump is stopped again. With **CONT. REFILL: OFF** water refill stops whenever the pump starts.

In some installations (such as with low flow rate filtration) pump running time does not allow enough free time to adequately refill the pool. In such cases, **CONT. REFILL** allows refilling whilst the pump is running. With **CONT. REFILL: YES**, once started the refill will continue until the water level is **HIGH**, even if the pumps start.

---

**WARNING:**

With **REFILL CONT: YES**, a poor installation or a defective non-return valve could allow pool water to enter the water supply. This poses a health risk and may only be used if the house water supply is separate from the pool water supply.

---

5.4.1.4 Maximum Duration

This setting is displayed if mode: **REFILL** or **AUTO**.
Automatic Pool Refill always refills approximately the same volume of water, which corresponds to approximately 2cm of water at the pool surface. Therefore, as the water supply usually delivers a constant rate the expected refill duration can be estimated.

Use the **MAX DURATION** parameter to limit the time (and hence water volume) added to the pool during a refill operation. This protects against excessive water consumption in case of significant pool leaks.

The **MAX DURATION** is a daily timeout for pool refill. If reaching the maximum duration during a 24 hour period, refill stops until the following day and an alert is sent advising of this condition. Check for possible leaks or low water supply pressure. The Alert is reset at midnight and another refill can be commanded the following day.

If this situation occurs on **3 consecutive days**, Water top-up will be **postponed** until the alert is cleared manually.

---

5.4.1.5 Draining

This setting is displayed if mode: **REDUCE**, **AUTO**.
Set the duration for the water reduction cycle.

If the level is detected **V_HIGH**, then PoolCop will reduce water level following this logic:

- Water will preferably be consumed for backwashing the filter (if permitted, see 5.6.3 Filter Data), otherwise it will be sent to waste.
- With “classic” pools, reduction will be launched if level sustains **V_HIGH** for 15 minutes.
- With rimflow pools, pump will be started immediately when level is detected **V_HIGH** and will run until either:
  - level returns **NORMAL**
  - Level stays **V.High** for 15 minutes, which will launch a water level reduce cycle and then the pump will stop.
  - Level stays **HIGH** for 3 hours, which will also launch a water level reduce cycle and then the pump will stop.

Up to three cycles will be carried out per day.
5.4.2 pH Control

Set pH control parameters

5.4.2.1 Installed

If INSTALLED: YES, PoolCop will control the pH according to set point value. pH Control display will be activated; pH Control Alerts will be activated. If set to NO, these functions are deactivated.

5.4.2.2 Mode

Set the pH Control to reduce or increase pH using the appropriate chemicals.
- **READ**: if the pool has a standalone pH control system or if you do not want to control pH but get a reading.
- **PH-**: if pH Minus liquid is used.
- **PH+**: if pH Plus liquid is used.

5.4.2.3 Max Dosing

**MAX DOSING** acts as a security to prevent inadvertent overdosing, initially calculated with pool volume, can be adjusted. This setting is higher with bigger pools, and with higher water alkalinity; this setting is lower with larger feeder pumps.

5.4.2.4 Setpoint

Set the desired pH value; a typical Setpoint is 7.2. The ideal Setpoint varies with water treatment options, and according to refill water types. **Note**: this Setpoint is intended for water at 24°C; actual Setpoint will be automatically corrected according to the actual water temperature (see below).

5.4.2.5 Setpoint Current Temperature °C

PoolCop automatically adjusts the required pH Setpoint as a function of temperature to ensure year-round optimal water treatment. This adjusted Setpoint is displayed against current water temperature. This corrected Setpoint is the actual value of pH the PoolCop will aim to maintain.

5.4.2.6 Priming

Ensure feeder pump is connected to Aux7 and correctly powered. Commanding priming ON will activate Aux7 for 60 seconds allowing the feeder pump to prime. Priming is stopped when quitting the menu or after 60 seconds.

NOTE: Make sure to keep at least 30 minutes between filtration cycles to allow pH to work properly.
5.4.3 ORP Control

Set disinfectant parameters based on ORP control

5.4.3.1.1 Installed

If **INSTALLED**: YES, PoolCop will control the ORP according to set point value. ORP Control display will be activated; ORP Control Alerts will be activated. If set to **NO**, these functions are deactivated.

5.4.3.1.2 Disinfectant

Set the disinfection option and algorithms used.
- **READ**: Read and display only; no control
- **CHLOR**: Chlorine dosing
- **SALT**: External Salt System control
- **BROMI**: Bromine dosing
- **OTHERS**: for other situations, algorithm not optimized

5.4.3.1.3 Setpoint

Set the desired ORP value; a typical Setpoint is 650 - 720.

The ideal Setpoint varies with water treatment options, and according to refill water types.

5.4.3.1.4 Boost on

If hyper-chlorination is desired, set a day of the week.

5.4.3.1.5 Boost to

If a day of the week is set for hyper-chlorination, set the desired the ORP value. Can’t be lower than Setpoint

5.4.3.1.6 Priming

Ensure feeder pump is connected to Aux6 and correctly powered.

Commanding priming ON will activate Aux6 for 60 seconds allowing the feeder pump to prime. Priming is stopped when quitting the menu or after 60 seconds.
5.4.4 Remnant Injection

Set Remnant parameters. If possible, Remnant will be injected 1 hour before the end of the latest filtration cycle of the day. If there is no filtration cycle long enough, the longer cycle will be chosen, but the volume actually injected may not fit the requirements.

5.4.4.1 Installed

If **INSTALLED: YES**, PoolCop will control the Remnant injection according to parameters settings. If set to **NO**, this function is deactivated.

5.4.4.2 Aux Channel

Define the channel used to inject remnant. All available channels can be used. If the XM8 Extension Module is connected, Channel choice could be up to Aux15 otherwise it will be up to Aux6.

5.4.4.3 Injection Rate

Set the feeder pump injection rate in liter/hour. Combined with pool volume (**POOL DATA** menu), the injection rate will be used to calculate the injection duration based on 2 ml/m3/day.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Volume Injected</th>
<th>Increase of ppm Liquid Chlorine (12%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20°C</td>
<td>2 ml/m3</td>
<td>+0.24 ppm</td>
</tr>
<tr>
<td>25°C</td>
<td>3 ml/m3</td>
<td>+0.36 ppm</td>
</tr>
<tr>
<td>30°C</td>
<td>4 ml/m3</td>
<td>+0.48 ppm</td>
</tr>
</tbody>
</table>

5.4.4.4 Temperature adjustment

Choose **YES** if the injected volume has to be corrected according to pool water temperature. If Yes, adjustment occurs between 24°C and 30°C; At 30°C, the injected volume is 2 times higher.

5.4.4.5 Extra Adjustment

Add an extra adjustment parameter applying a coefficient to the calculated volume as follow:

- **LOW**: Coefficient is 0.5 (half the volume, for example for indoor pools)
- **MEDIUM**: Coefficient is 1.0
- **HIGH**: Coefficient is 1.5 (1.5 times the volume, for high consumption pools)

5.4.4.6 Priming

Ensure the feeder pump is connected to chosen Aux and correctly powered. Commanding priming **ON** will activate the Aux channel for 60 seconds allowing the feeder pump to prime. Priming is stopped when quitting the menu or after 60 seconds.
5.5 **Maintenance**

Specific parameters dedicated to pool maintainers.

### 5.5.1 Adjust Water Temperature

Allows you to align PoolCop temperature indication to third party equipment like a heat pump by adding an offset to the temperature indication. The value between parenthesis is the actual offset.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp (0.0)</td>
<td>0.0°C</td>
<td>-9.9°C - 9.9°C</td>
</tr>
<tr>
<td>Air AntiFrz.</td>
<td>-5°C</td>
<td>-9°C - 9°C</td>
</tr>
<tr>
<td>Service Mode</td>
<td>NO</td>
<td>YES, NO</td>
</tr>
<tr>
<td>Stop treatmt</td>
<td>12°C</td>
<td>0°C - 18°C</td>
</tr>
<tr>
<td>Measure pH</td>
<td>7.7</td>
<td>0.1</td>
</tr>
<tr>
<td>Calibrate pH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 5.5.2 Air Anti-Freeze

When an air sensor is connected, defines the air temperature value to start antifreeze protection. See 4.4.4.7 Antifreeze Protection for further details.

### 5.5.3 Service Mode

In service mode, PoolCop stops all its automatic actions. Every connected device (pump, Auxiliaries, water refill...) is stopped when using this mode. PoolCop will only respond to manual command. This mode could be used for passive winterization or during maintenance actions.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Mode</td>
<td>NO</td>
<td>YES, NO</td>
</tr>
</tbody>
</table>

### 5.5.4 Stop Water Treatment

When water temperature decreases, some disinfection devices (for e.g. salt systems) are prone to more rapid wear. However, algae, viruses and bacteria growth slow down considerably in cold water; reducing the run time of these devices thus serves to extend their lifespan.

Choose the temperature value to stop all ORP driven disinfection systems. Should the chosen temperature be 0°C, the protection will be disabled.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop Treatmt</td>
<td>12°C</td>
<td>0°C - 18°C</td>
</tr>
</tbody>
</table>

### 5.5.5 Measure pH

Perform an extra pH measurement.

Pump must be stopped to allow measurement.
5.5.6 Calibrate pH

Calibrate pH to a known value

Carry out a calibration procedure for the pH sensor. The calibration procedure is described in the MAINTENANCE MANUAL (procedure SMU_07_EN) downloadable on our internet website www.poolcop.com in RESOURCES/DOWNLOADS section.

NOTE:
During the calibration process, PoolCop compares the “offset” of the probe to the signal that would be delivered by a perfect probe. This offset is essentially related to sensor aging. If the offset is too large, calibration is not possible. It is then necessary to check that the reference pH is correct. If this is the case, the probe must be replaced.

5.6 Configuration Menu

PoolCop configuration menu

5.6.1 Pool Data

Set pool parameters

5.6.1.1 Volume

Enter the pool VOLUME, in cubic meters. This is used for filter duration calculations in all automatic modes. 10m³ or less is considered a spa for filter duration calculations: hydraulic corrections are not applied.
5.6.1.2 Flow Rate

Enter the **FLOW RATE** in m³/h of the hydraulic circuit with a clean filter. This is used for filter duration calculations in automatic modes:

- Measure the actual hydraulic flow and enter this figure for optimum performance; or
- Use the lowest of the nominal filter rate and the nominal pump rate, less 20% as the entered flow rate.
- When programming for use with a variable speed/flow pump, estimate the average daily flow rate.

| Text: Flow Rate | Default: 15 | Entries: 1 - 99 |

5.6.1.3 Turnovers

Set the desired **TURNOVERS** per day. This is used for filter duration calculations in **VOLUME** mode.

| Text: Turnovers | Default: 2 | Entries: 1 - 10 |

5.6.1.4 Freezing Protection

Activate or deactivate freezing protection.

When freezing risk is detected, either internally or externally (if installed) filtration is run for at least 30 minutes.

- **CAUTION:**
  PoolCop freezing protections can only assist in the protection of equipment. PoolCop cannot guarantee that damage will be avoided under all circumstances, as this depends on many factors. No responsibility will be accepted for damage caused due to freezing.

- **NOTE:**
  When freezing risk is detected and filtration started, the pump CANNOT be stopped until the temperature detected is higher than the protection setting, or the Protection Antifreeze is switched OFF in the Pool Data menu.

- **NOTE:**
  The freezing risk alerts are always active, even with freezing protection OFF.

- **NOTE:**
  Multispeed pumps are started on speed #1 supposedly the lowest speed.

5.6.1.5 Filtration Reduction when pool cover is detected closed

To be effective, this functionality assumes the connection of pool cover, or mobile floor limit switch to a PoolCop input. (see 5.6.4 Inputs). Depending if pool is configured with a single or multi-speed pump, reduction strategy is different:

5.6.1.5.1 Filtration time reduction (single speed pump)

Select the reduction percentage you want to apply to the filtration duration (Apply only to **ECO+** mode) when the cover is closed.

| Text: Cover Reduc | Default: 30% | Entries: 0% - 70% |

5.6.1.5.2 Pump speed reduction (multi speed pump)

Select the desired pump speed (apply to every filtration mode) when the cover is closed. This speed will replace the normal Cycle 1 or Cycle 2 preselected speeds as long as the cover is closed.

If value is 0, no change will occur when the cover state change.

| Text: Cover speed | Default: 0 | Entries: 0 - 8 |
5.6.1.6 Pool Type

Selecting the type of pool automatically configures some functions:

- **CLASSIC** - the valve reverts to a “safe” FILTER position whenever filtration is inactive. Water level control is standard.
- **INFIN.A** - the valve reverts to a “safe” FILTER position whenever filtration is inactive. Water level control is adapted to suit an infinity pool.
- **INFIN.B** - the valve reverts to a “safe” *Closed* position (to prevent the pool draining into the buffer tank with the pump *OFF*) whenever filtration is inactive. Water level control is adapted to suit an infinity pool.
- **SPA** - the valve reverts to a “safe” FILTER position whenever filtration or other functions are inactive, and there is no volume correction in ECO mode.

### Table

<table>
<thead>
<tr>
<th>Default</th>
<th>Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Classic</strong></td>
<td>Classic; Infini.A ; Infini.B ; Spa</td>
</tr>
</tbody>
</table>

**NOTE:**

Changing the Pool Type affects the safe valve position as well as the way that water level control functions. Be sure to read and fully understand the implications prior to changing this setting.

5.6.2 Pump Data

### 5.6.2.1 Pump Type

When entering the **PUMP DATA** menu, **LOW ALERT** is preselected. To change the pump from Single Speed Pump to a variable or *variable* speed pump, press the UP arrow and press **SELECT**; now use the arrows to select the pump make and model installed. Refer to the *PoolCop Variable Speed Pump Guide* for further details including connecting and programming.

Note: **Binary combination** offers the full possibilities of any combination using Pump and Aux1/2/3 relays. This option can be used to control several mono speed pumps.

### Table

<table>
<thead>
<tr>
<th>Default</th>
<th>Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE SPEED PUMP</td>
<td>SINGLE SPEED PUMP; PENTAIR IntelliComm ; PENTAIR SuperFlo VS ; HAYWARD Eco Star; HAYWARD Gamme VSTD; BADU Eco Touch-pro; BADU 90 Eco Motion; ZODIAC FloPro VS; INVERTEK OptiDrive; Binary Combination Davey ProMaster VSD400 DAB E.SWIM E.PRO</td>
</tr>
</tbody>
</table>

### NOTE:

SINGLE SPEED PUMP is selected for Pentair IntelliFlo pumps if connected without IntelliComm.

5.6.2.2 Low Alert

Set the pressure at which the Low Pressure alert is activated. This alert is used primarily to indicate that the skimmer or pump baskets are contaminated, reducing flow and filter pressure. This alert has no effect on the operation of equipment, it is an advisory only.

### Table

<table>
<thead>
<tr>
<th>Default</th>
<th>Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50 bar</td>
<td>0.1 - 1.80 bar</td>
</tr>
</tbody>
</table>

(min = PROT. PRESSURE see 5.6.2.3) (max = FILTER PRESSURE see 5.6.3.1)

**Setting the pressure limit:**
Start the automatic pool cleaner and set valves.
Ensure that all debris has been removed from the baskets.
If using a variable speed pump, set minimum speed or flow programmed.
Let filtration run for a few minutes to expel any air in the system.
Note the low pressure reading on the PoolCop.
Round off to next lower round number and subtract a 0.20 bar margin.

Example
Lowest pressure noted = 0.76 bar
Round DOWN = 0.70 bar
Subtract 0.20 bar = 0.50 bar
If the alert “WARN: LOW PRESS” displays under normal circumstances, decrease this setting progressively.

5.6.2.3 Protection Pressure

Set the pressure at which the pump protection will stop the pump to avoid damage and activate an alert. As long as the pressure in valve housing is higher than Protection Pressure, the valve will not be allowed to rotate.

Setting the pressure limit:
- Stop the pump and let indicated pressure stabilize.
- Note the Pump OFF pressure reading on the PoolCop:
  - If the pump is higher than the pool, this should be 0 bar;
  - If the pump is lower than the pool, there should be a head of pressure.
- Round this figure up and add a margin of 0.20bar.
- Set this pressure as the Prot. Pressure.

Example
Pump OFF pressure =0.15 bar
Round UP =0.20 bar
Add 0.20 bar =0.40 bar
If the alert “WARN: VALVE ROTATION valve rotation inhibited dur high static pressure” displays when the valve should rotate, increase this setting incrementally and progressively.

5.6.2.4 Activate Pump Protection

PoolCop protects the pump, by switching OFF the pump and integrated water treatments in the event pressure measured is below the Prot. Pressure for 8 minutes. In the case where pumps have their own protection systems, this protection can be inhibited to prevent protection conflicts.
Switching Prot. Pump OFF disables the pump protection in the event that very low pressure is measured. Alerts are still active, and in the event of the Alert activation other internal functions (pH Control, ORP Control, Remnant injection) will stop.

WARNING:
Switching pump protection to OFF should only be done where the pump has its own protection system. If in any doubt, Pump Protection should be ON.

WARNING:
With Prot. Pump OFF, only integrated water treatment functions are stopped when this protection is activated; equipment connected to Aux relays will not be stopped.

5.6.2.5 Cycle 1 Speed (if variable speed pump configured)

Select the speed linked to Filtration Timer cycle 1. (Speed numbers is linked to the pump type)

5.6.2.6 Cycle 2 Speed (if variable speed pump configured)

Select the speed linked to Filtration Timer cycle 2. (Speed numbers is linked to the pump type)
5.6.2.7 Clean Speed (if variable speed pump configured)

Select the speed linked to filter cleaning cycles. (Speed numbers is linked to the pump type)

<table>
<thead>
<tr>
<th>Text</th>
<th>Clean Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>0</td>
</tr>
<tr>
<td>Entries</td>
<td>0, 1, 2, 3, 4, 5, 6, 7, 8</td>
</tr>
</tbody>
</table>

**NOTE:**
With variable speed pumps a speed (not 0) must be linked to filtration and cleaning; if one of these speeds is set to zero, the pump will be considered as single speed pump.

5.6.3 Filter Data

Set filter parameters

### FILTER DATA

- **Pressure**: 1.00 bar
- **Frequency**: 0
- **Waste Valve**: NO
- **Cleaning**: MANUAL
- **Backwash**: 60 Sec
- **Rinse**: 10 sec

**SELECT**  **QUIT**

5.6.3.1 Pressure

Set the pressure at which an alert reminder “REMIND: CLEAN FILTER” is trigger, or at which automatic Clean Filter Cycle will be triggered. If measured pressure exceeds this threshold pressure for more than 3 minutes, an alert to clean the filter will be trigger, and an automatic Clean Filter Cycle will be carried out if configured **CLEANING: AUTO**.

**Setting the pressure limit:**
- Remove/stop the automatic pool cleaner and reset valves.
- Ensure that all debris has been removed from the baskets.
- If using variable speed pump, set maximum speed or flow programmed.
- Let filtration run for a few minutes to expel any air in the system.
- Note the base pressure reading on the PoolCop.
- Round off to next higher round number and add a 0.10 bar margin.

**Example**

- Base pressure noted = 0.88 bar
- Round UP = 0.90 bar
- Add 0.10 bar = 1.00 bar

If Clean Filter Cycles occur too frequently, increase this setting incrementally. Whenever resetting or adjusting this pressure, ensure that the filter is clean to get an accurate base pressure.

**Generally base pressure decreases over time as the filter media deteriorates.**

A steadily increasing base pressure indicates that the filter media is clogging.

5.6.3.2 Periodic

Set the maximum numbers of days between 2 Clean Filter alerts or automatic cycles.

If the periodic cleaning is not required, select 0 days.

5.6.3.3 Waste Valve

Select YES if an automatic waste valve is fitted on the waste line. This valve, controlled by Aux5, will be opened by PoolCop when the “main” valve is on Waste, Backwash or Rinse positions.

<table>
<thead>
<tr>
<th>Text</th>
<th>Waste Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>NO</td>
</tr>
<tr>
<td>Entries</td>
<td>YES; NO</td>
</tr>
</tbody>
</table>
### 5.6.3.4 Cleaning

Select the cleaning mode according to your needs and according to the filtering media possibilities (see below)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Default</th>
<th>Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhibit</td>
<td>Inhibit</td>
<td>manual; auto</td>
</tr>
</tbody>
</table>

**CAUTION:**
Incorrect setting of the cleaning function can result in damage to the filtration equipment.

The following settings are required:

<table>
<thead>
<tr>
<th>Type of filter</th>
<th>Setting</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartridge</td>
<td>Inhibited</td>
<td>Backwash impossible</td>
</tr>
<tr>
<td>D.E.</td>
<td>Manual</td>
<td>Replacement D.E. charge required immediately after cleaning cycle</td>
</tr>
<tr>
<td>Sand or Multimedia</td>
<td>Auto</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Setting</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Four valve positions are available (Backwash and Rinse are inhibited).</td>
</tr>
<tr>
<td></td>
<td>If configured, automatic water level reduction sends surplus water to waste.</td>
</tr>
<tr>
<td></td>
<td>All six valve positions are available.</td>
</tr>
<tr>
<td></td>
<td>Backwash and Rinse durations can be configured.</td>
</tr>
<tr>
<td></td>
<td>The filter is cleaned only via MANUAL CONTROL menu.</td>
</tr>
<tr>
<td></td>
<td>If configured, automatic water level reduction sends surplus water to waste.</td>
</tr>
<tr>
<td></td>
<td>All six valve positions are available.</td>
</tr>
<tr>
<td></td>
<td>Backwash and Rinse durations can be configured.</td>
</tr>
<tr>
<td></td>
<td>Filter media is auto cleaned as required, and via MANUAL CONTROL menu.</td>
</tr>
<tr>
<td></td>
<td>If configured, automatic water level reduction uses surplus water to clean the filter media.</td>
</tr>
</tbody>
</table>

### 5.6.3.5 Backwash

Displayed if CLEANING: AUTO or CLEANING: MANUAL.
Set the desired backwash duration.
Refer to the filter manual for recommended backwash duration.

<table>
<thead>
<tr>
<th>Text:</th>
<th>Backwash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default:</td>
<td>60 seconds</td>
</tr>
<tr>
<td>Entries:</td>
<td>10 - 600 seconds, 10 second increments</td>
</tr>
</tbody>
</table>

### 5.6.3.6 Rinse

Displayed if CLEANING: AUTO or CLEANING: MANUAL.
Set the desired rinse duration.
Refer to the filter manual for recommended rinse duration.

<table>
<thead>
<tr>
<th>Text:</th>
<th>Rinse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default:</td>
<td>20 seconds</td>
</tr>
<tr>
<td>Entries:</td>
<td>10 - 180 seconds</td>
</tr>
</tbody>
</table>
5.6.4 Inputs

Set digital inputs identifier and behavior

**WARNING:**
If the equipment is used for pH, ORP or any other treatment control, a water circulation flow detection sensor must be correctly installed to comply with NSF/ANSI 50 where required. Input(1) is pre-configured for flow detection sensor and must not be re-affected.

5.6.4.1 Input Name

Various inputs can be installed and configured for use with PoolCop.

<table>
<thead>
<tr>
<th>Text</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default 1</td>
<td>Flow Switch</td>
</tr>
<tr>
<td>Default 2</td>
<td>Available</td>
</tr>
<tr>
<td>Entries:</td>
<td>Available;</td>
</tr>
<tr>
<td></td>
<td>Thermostat AntiFrz;</td>
</tr>
<tr>
<td></td>
<td>Disinf Consumables;</td>
</tr>
<tr>
<td></td>
<td>pH Consumables;</td>
</tr>
<tr>
<td></td>
<td>Consumables;</td>
</tr>
<tr>
<td></td>
<td>Pool Cover;</td>
</tr>
<tr>
<td></td>
<td>Salt System;</td>
</tr>
<tr>
<td></td>
<td>Filtration Start</td>
</tr>
<tr>
<td></td>
<td>Filtration Stop</td>
</tr>
<tr>
<td></td>
<td>Jetstream</td>
</tr>
<tr>
<td></td>
<td>Flow Switch</td>
</tr>
</tbody>
</table>

5.6.4.2 Sense of Action

The sensor action configures whether the alert action is taken when the circuit is closed (direct action) or open (reverse action). For example:

- If the thermostat contact closed indicates a freezing risk, choose "Action when CLOSED".
- If the level detection senses that consumables are low by opening the contact in the switch, choose "Action when OPEN".

Configures whether the alert is triggered when the circuit is closed (direct action) or open (reverse action).

5.6.4.3 Alert

Determines whether an Alert is associated with the sensing on the input or not. If YES, when input is detected, an alert will be displayed on screen and send to server (if connected to internet)

<table>
<thead>
<tr>
<th>Text</th>
<th>Alert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default 1</td>
<td>NO</td>
</tr>
<tr>
<td>Default 2</td>
<td>NO</td>
</tr>
<tr>
<td>Entries:</td>
<td>NO;</td>
</tr>
<tr>
<td></td>
<td>YES</td>
</tr>
</tbody>
</table>
5.6.4.4 Input Role

The inputs can be assigned to various functions, and the setting is used to inform the software functions assigned to each entry.

The following predefined functions are available:

<table>
<thead>
<tr>
<th>Entries</th>
<th>Delay</th>
<th>Role, Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>Default, the input is not active.</td>
<td></td>
</tr>
<tr>
<td>Thermostat</td>
<td>5 seconds</td>
<td>The connection of an external antifreeze thermostat assists in protection against damage due to freezing. When detected and if the mode is activated in POOL DATA menu, antifreeze protection is activated, and filtration is started, and is accompanied by an alert.</td>
</tr>
<tr>
<td>Antifreeze</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumables</td>
<td>5 seconds</td>
<td>The connection of a consumables low level detector (typically a float switch on a suction wand) triggers an alert when low level is detected. This alert is dedicated to disinfection consumables.</td>
</tr>
<tr>
<td>Disinfection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumables pH</td>
<td>5 seconds</td>
<td>The connection of a consumables low level detector (typically a float switch on a suction wand) triggers an alert when low level is detected. This alert is dedicated to pH control consumables.</td>
</tr>
<tr>
<td>Consumables</td>
<td>5 seconds</td>
<td>If two chemical level sensors are combined, (for example one for disinfection and one for pH control) these two signals can be wired in parallel, so that a single signal can trigger the “Consumable” alert. This is useful when the second input is required for another action, such as pool cover position for example.</td>
</tr>
<tr>
<td>Pool Cover</td>
<td>2 seconds</td>
<td>To reduce the duration of filtration (if in ECO+ mode) and ionization when the cover is closed. Generates an alarm in the non-closed position. If the pool is equipped with a variable speed pump, PoolCop switches on the speed n° 1. When the cover is re-opened during a cycle of operation of the pump, the speed associated with this cycle is restored. If a filtration cycle is running when the cover is closed, this cycle will not be affected by reduction. Only the following cycles will be affected.</td>
</tr>
<tr>
<td>Salt System</td>
<td>60 seconds</td>
<td>With a compatible salt water chlorination system installed and connected, the LOW SALT and/or SHUTDOWN feature will trigger an alert message “Salt System: Intervention Required”</td>
</tr>
<tr>
<td>Filtration Start</td>
<td>2 seconds</td>
<td>The input can be used to command the filtration to run by means of an external run command, from a switch, button or an external automation. Removing this input command will stop the filtration unless ON in another mode.</td>
</tr>
<tr>
<td>Filtration Stop</td>
<td>2 seconds</td>
<td>The input can be used to stop the filtration using an external control. Warning: This decision overrides any other orders including antifreeze protection. If a filter cleaning is in progress when the request occurs, it will be stopped, but the filter will be rinsed.</td>
</tr>
<tr>
<td>Jetstream</td>
<td>0 seconds</td>
<td>The input can be used to toggle a Jetstream pump. The action will be taken when a Jetstream Equipment is declared (see 5.6.6 Equipment for further details).</td>
</tr>
<tr>
<td>Flow Switch</td>
<td>2 seconds</td>
<td>The input can be used to connect a flow switch. If the flow is not detected, pH injection, disinfectant injection and Auxiliaries declared slaved to pump will be stopped. Normal situation will resume automatically as soon as the flow is detected again. pH injection may resume immediately as well as auxiliaries, but disinfectant will resume with an observation period, so dosing may restart with 10 minutes delay.</td>
</tr>
</tbody>
</table>

Note: the delay is used to filter out events of very short duration.
5.6.5 Factory Settings

Besides the described settings below, displays the firmware version which may be required for support.

5.6.5.1 FW Version Menu

FW view

- V42.84.0: Firmware version Id.
- GEN.EU: Model and Region Id.
  - Model GEN => Genesis
  - Model STD => Standard
  - Region EU => Europe
  - Region US => USA/Canada
- Nov 4 2019: Release date
- 0C1245E: Verification Code.

5.6.5.2 Network Menu

Network:
- MC: MAC address, you will need this information to declare PoolCop on the PoolCopilot Server.
- IP: IP address of PoolCop on the local network.
- DNS: IP address of the Domain Name Server.
- GTW: IP address of the gateway (router) on the local network.
- SVR: IP address of PoolCopilot.com server
- URL: Name of the server

5.6.5.3 Time/Date Menu

Set Time and Date

08:12:45
12/11/2014
Wed
5.6.5.3.1 Setting Time
Set and adjust system Time.
PoolCop adjusts for daylight saving if connected to the PoolCopilot server.

<table>
<thead>
<tr>
<th>Text:</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entries:</td>
<td>24h</td>
</tr>
</tbody>
</table>

5.6.5.3.2 Setting Date
Set and adjust system Date.
PoolCop adjusts for daylight saving if connected to the PoolCopilot server.

<table>
<thead>
<tr>
<th>Text:</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entries:</td>
<td>dd/mm/yyyy</td>
</tr>
</tbody>
</table>

5.6.5.4 Language Menu
Select PoolCop language

<table>
<thead>
<tr>
<th>Text:</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default:</td>
<td>EN</td>
</tr>
<tr>
<td>Entries:</td>
<td>EN - FR - NL - IT - TK - DE - SP - PT</td>
</tr>
</tbody>
</table>

5.6.5.5 Factory Reset
Selecting and confirming resets all defaults and calibrations, requiring reprogramming and recalibration of sensors.

<table>
<thead>
<tr>
<th>Text:</th>
<th>Factory Reset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default:</td>
<td>NO</td>
</tr>
<tr>
<td>Entries:</td>
<td>YES, NO</td>
</tr>
</tbody>
</table>
5.6.6 Equipment

Allows you to define the Pool Cover, Jetstream settings.

NOTE:
These functionalities are only available if an XM8 Extended Module is installed and if the required Aux outputs and Inputs are free to used.

5.6.6.1 Pool Cover

Set pool cover parameters.

WARNING:
Remote control of a pool cover can cause severe injury. The user MUST ALWAYS have the pool in direct view when maneuvering the cover. The pool must be monitored at all times during the operation of the pool cover to ensure that no person is in the pool or enters the pool. The remote control of the pool cover is reserved for maintenance operations carried out by an authorized technician.

5.6.6.1.1 Installed

If INSTALLED: YES, PoolCop will be able to control the pool cover opening and closing. If set to NO, the pool cover (if any) will be operated manually.

Entries:

<table>
<thead>
<tr>
<th>Text</th>
<th>Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>NO</td>
</tr>
<tr>
<td>Entries</td>
<td>YES; NO</td>
</tr>
</tbody>
</table>

5.6.6.1.2 Opening Setting (Aux14 Settings)

When pool cover function is installed, Aux14 (Open command) is preconfigured in pulse mode with 2 minutes pulse duration. These settings can be changed from this view. Duration should be long enough to allow full cover operation from closed to open.
5.6.6.3 Close Setting (Aux15 Settings)

When pool cover function is installed, Aux15 (close command) is preconfigured in pulse mode with 2 minutes pulse duration. These settings can be changed from this view. Duration should be long enough to allow full cover operation from open to close.

<table>
<thead>
<tr>
<th>AUX15: Rsrv'd Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode: Pulse</td>
</tr>
<tr>
<td>ON: 00:00</td>
</tr>
<tr>
<td>Duration: 00:02:00</td>
</tr>
</tbody>
</table>

5.6.6.14 Position Setting (In10 Settings)

When pool cover function is installed, In(10) is preconfigured for pool cover ‘closed’ position sensing. The settings can be changed from this view, in particular, one can decide to get an alert (or not) when cover is not detected closed.

<table>
<thead>
<tr>
<th>INPUTS 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pool Cover: Closed</td>
</tr>
<tr>
<td>Action when: Closed</td>
</tr>
<tr>
<td>Alert: NO</td>
</tr>
</tbody>
</table>

5.6.6.2 Jetstream

Set jet stream parameters

5.6.6.2.1 Installed

If **INSTALLED**: YES, PoolCop will be able to control a Jetstream either via the pushbutton in the pool either via a direct command. If set to **NO**, the Jetstream (if any) will be operated manually.

<table>
<thead>
<tr>
<th>Text: Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default: NO</td>
</tr>
<tr>
<td>Entries: YES; NO</td>
</tr>
</tbody>
</table>

5.6.6.2.2 Setting Command (Aux13 Settings)

When Jetstream is installed, Aux13 (Pump command) is preconfigured in pulse mode with 60 minutes pulse duration. These settings can be changed from this view.

<table>
<thead>
<tr>
<th>AUX13: Rsrv'd JetSt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode: Pulse</td>
</tr>
<tr>
<td>ON: 00:00</td>
</tr>
<tr>
<td>Duration: 00:60:00</td>
</tr>
<tr>
<td>Slave: NO</td>
</tr>
<tr>
<td>Weekday: ✓✓✓✓✓✓✓✓</td>
</tr>
</tbody>
</table>
5.6.6.2.3 Setting Push Button (In9 Settings)

When Jetstream is installed, In(9) is preconfigured to receive the push button action. The settings can be changed from this view.

NOTE:
The push button pneumatic signal must be converted into an electrical contact outside PoolCop using a pressure switch. The contact will be then connected on In(9).
INTENTIONALLY BLANK
6.1 INTRODUCTION

The swimming pool can now be accessed 24 hours a day, 365 days a year on a computer, tablet or Smartphone. Pool control can be granted to pool technicians, a family member or a neighbor. User choose whether to receive alerts and notifications by email. There is free unlimited access to the PoolCopilot server.
6.2 **POOLCOP CONNECTION TO THE WEB**

6.2.1 **How to get Internet to PoolCop**

The CCU is equipped with an RJ45 waterproof compression gland connector. Bringing the network to the CCU:

- Best is to have an Ethernet cable (mini Cat4) connecting the router to the CCU by RJ45.
- If not possible, Powerline adaptors will allow to carry the Ethernet signal through the 220V power line from the router to the CCU (one Powerline Adaptor at the router and the other adjacent to the CCU):

![Figure 57 - Power Line Adaptors](image)

- Wi-Fi is a convenient solution to bring the signal to the CCU but may require repeaters along the way to keep the signal strength. This also may require you get access to the WEP or other key code.
- On the CCU side, insert the RJ45 cable through the cable compression gland supplied as shown in the picture below:

![Figure 58 - RJ45 Connector for Ethernet](image)

- Check that access to internet is available at the cable end. You may need a laptop to check this.
- Connect the end of the RJ45 cable to the network so as to establish a connection via the internet box.
- Start PoolCop (if it was stopped).

6.2.2 **Check the connection**

- On PoolCop screen, go to Menu/Configuration/Factory Settings/network and note the MAC address as shown below:

<table>
<thead>
<tr>
<th>Network</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC</td>
<td>02:11:40:00:0B:C9</td>
</tr>
<tr>
<td>IP</td>
<td>192.168.1.77</td>
</tr>
<tr>
<td>MSK</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>DNS</td>
<td>192.168.1.1</td>
</tr>
<tr>
<td>GTW</td>
<td>192.168.1.1</td>
</tr>
<tr>
<td>SVR</td>
<td>195.14.0.21</td>
</tr>
</tbody>
</table>

The connection is now established.
6.3 **SERVER CONNECTION AND POOL SETUP**

This operation requires the use of a computer with an internet browser of your choice. It can be done from any location, though it is preferable to remain in close proximity to the PoolCop should any communication issues arise.

### 6.3.1 Creating a User Account

- Connect to the site [www.poolcopilot.com](http://www.poolcopilot.com).
- On the home page, select “Create New Account”.

Select the type of profile required:

- **“Personal Account”** will allow you to manage only your own pool as a final customer.
- **“Pro Account”** will allow you to manage your clients’ pools.

Complete all the information required in the form, in particular:

- Supply a valid email address; this will be used to identify the client and to route email alerts.
- Tick the boxes to agree to terms of use, and optionally **“I agree to receive data from PoolCop”** to receive newsletters.
- Click on **“Submit”** to register and create your new account.
6.3.2 Adding your first Pool and PoolCopilot Module Automatically

- The setup wizard will now take you to a page to add the MAC address of the PoolCopilot module and create your new pool.
- Add your 12 number MAC address.
- Choose a Pseudo
- Click on submit.

You will be redirected to the Control Panel view of your new pool.

6.3.3 Adding a Pool and PoolCopilot Module “Manually”

- Connect and logon to the site using the email address and password used to create the account.
- On the Home Page, select “My Account” at the top right of the page.
- Now select “My PoolCops”, “connect a PoolCop”

- Complete the form:
  - The Mac Address is the unique identification of the new PoolCop. This code is written on the sticker located on the PoolCopilot Web RJ45 module inside the ABS Box.
  - The nickname allows easy identification of the PoolCop.
  - If connecting to a new Pool, select “Add a pool manually” and complete Pool data.
  - If connecting to an existing pool, select the pool from the dropdown list.
- Click on “Submit”.

6.3.4 Your Preferences

To set preferences such as Language, Units and Formats, select “My Preferences”:
6.3.5 Access Pool or Pools

In the case where you are managing one swimming pool, you will be automatically directed to the Control Panel after logging on.

The connection status between PoolCop and the server can be viewed on the top left. This allows you to ascertain that data is up to date and valid.

Managing multiple pools you will be directed to the “My Pools” display after logging on; from here you can select the pool and PoolCop required.

Quickly access a specific pool from the list of pools in your portfolio by selecting a pool by nickname from the drop-down list.

If you wish to give access to the pool to somebody else, go to “Configuration/Pool Managers” and type in the email address provided by the manager.

The pool manager must have or must create an account on www.PoolCopilot.com using the same email address to access the pool.

You can remove this access at any time simply by ticking the corresponding box. Your manager will then be notified he is no longer allowed to access the pool.
6.3.6 User Interface Options
There are two user interface options, allowing different levels of control of the pool.
Change between interfaces by clicking on the button (unless a pool manager has locked the user
interface level).

6.3.6.1 EASY
The EASY interface allows basic control and visualization of pool data, as well as personal configuration.

6.3.6.2 EXPERT
The EXPERT interface allows full control of all functions and configuration.

6.4 PoolCopilot Functions
All PoolCop functions are possible from PoolCopilot. Additional functions are constantly made available as PoolCopilot evolves. These functions are made available via the web interface for all users. The list includes:

- Unlimited email alerts and notifications
- Geo-localization of the pool
- Backup and restoration of configurations
- History of all pool telemetry
- Etc.

Premium Functions add an extra level of functionality, and additional savings:

- Pool and other lighting linked to sunrise and sunset times.
- Delayed refill, to benefit from forecast rain.
- Etc.

6.5 Troubleshooting

6.5.1 Error Messages
"The MAC address is already in use": check the MAC address
"No PoolCop associated with the following address...": check the MAC address
"The MAC Address field is not a proper MAC address": check the MAC address

6.5.2 PoolCop will not connect to the server
- Check for proper connection in CCU.
- Check for proper connection to the internet box.
- Disconnect the RJ45 cable from the CCU, plug this cable on a laptop (turn Wi-Fi OFF on the laptop), and check that Internet access is available.
- If access is not available, check with router provider / IT service.
- Check IP address on Network menu. If IP is 0.0.0.0, no IP address has been affected to PoolCop, check if the DHCP mechanism is on the router and if there is no restriction to access Internet (restrictions on MAC addresses for example)
- Check SVR address on Network menu. If SVR is ---.--.--.--.--, the PoolCopilot server address was not resolved. Check if the DNS IP address is correct and enable on the router.

6.5.3 No data displayed
- Check that the connection button is green, showing that you are properly connected.

6.5.4 No graphs displayed in “History”
- Check your browser version is up to date.
- Check Flash Player is up to date, if required.
### Section 7  SPARE PARTS AND DIAGRAMS

#### 7.1 UF1100-G CONTROL CONNECTION UNIT CCU AMERICAN POOL

<table>
<thead>
<tr>
<th>No.</th>
<th>PART</th>
<th>Qty</th>
</tr>
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<tbody>
<tr>
<td>10</td>
<td>CF14101 Enclosure CCU BeGard B12306</td>
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</tr>
<tr>
<td>20</td>
<td>CF1450 Kit PGR Power Supply PGR103</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>CO2202 Battery 12V SLA</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>CF3103 04 Battery Cables UL</td>
<td>1</td>
</tr>
<tr>
<td>50</td>
<td>CF1401 01 Battery Housing</td>
<td>1</td>
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<tr>
<td>60</td>
<td>CF1402 14 Foam Cushioning</td>
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<tr>
<td>70</td>
<td>UF1342 Power Cord and Rug</td>
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<tr>
<td>80</td>
<td>CF1402 03 Urea Panel Mount Socket R14 158</td>
<td>1</td>
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<tr>
<td>90</td>
<td>CF1402 04 Cap R14 158</td>
<td>1</td>
</tr>
<tr>
<td>100</td>
<td>CF1114 CCU Switch</td>
<td>1</td>
</tr>
<tr>
<td>110</td>
<td>CF1101 01 Face Plate Sticker CCU American Pool</td>
<td>1</td>
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<tr>
<td>120</td>
<td>SN100 Sticker SN</td>
<td>1</td>
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<tr>
<td>130</td>
<td>XT14025 Tamper Proof Tongue Screw</td>
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### 7.2 CF1220-G Kit VDU Upper Part American Pool

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<td>10</td>
<td>CF1221-G VDU Cover with Keypad American Pool</td>
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<td>11</td>
<td>CF1221.01-W1 Cover of VDU White</td>
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<tr>
<td>12</td>
<td>CF1221.15-W1 Spindle Female White</td>
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<td>13</td>
<td>CF1221.16-W1 Spindle Male White</td>
<td>2</td>
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<tr>
<td>14</td>
<td>CF1221.03 Transparent Window</td>
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<tr>
<td>15</td>
<td>JT30005 O-Ring VDU Cover</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>CF1221.02-WS Lid of VDU White</td>
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<tr>
<td>17</td>
<td>CF1221.26 Keypad American Pool</td>
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<td>18</td>
<td>CF1221.17-W1 Fastening Clip VDU White</td>
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<td>20</td>
<td>CF1220.01 PCB Micro with LCD Screen PCB004.C</td>
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<td>30</td>
<td>CF1220.06-W1 PCB Micro Int. Cover White Drilled</td>
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<tr>
<td>40</td>
<td>CF1220.04 Cover Plug PCB Micro</td>
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<tr>
<td>50</td>
<td>TFB M35x20 Screw Head d35x20mm</td>
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<td>60</td>
<td>CF1220.03 Connection Cable</td>
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7.3 UF1210-W1 Kit VDU LOWER PART VERSION UF WHITE

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<td>10</td>
<td>CF1210.01-W1 Base VDU White</td>
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<td>20</td>
<td>CF1210.02 Motor Unit</td>
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<td>30</td>
<td>CF1215 Kit PCB Pickup</td>
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<tr>
<td>40</td>
<td>CF1218 Kit PCB Connection SE Data</td>
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<td>50</td>
<td>CF1210.15 Kit Sensor Water Temperature</td>
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<td>60</td>
<td>CF1224 Kit Sensor Pressure 0.2m Cable</td>
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<tr>
<td>70</td>
<td>CF1210.07 Plug VDU M17</td>
<td>2</td>
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<tr>
<td>80</td>
<td>JT0004 O-Ring VDU Plug</td>
<td>2</td>
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<tr>
<td>90</td>
<td>CF1210.02-W1 Electronics Cover White</td>
<td>1</td>
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<tr>
<td>100</td>
<td>CF1212.02 pH-ORP Sensor Housing</td>
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<tr>
<td>110</td>
<td>SO490x Kit Sensor SE pH-ORP</td>
<td>1</td>
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<tr>
<td>120</td>
<td>JT0006 O-Ring Housing Plug or Shaft</td>
<td>2</td>
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<td>130</td>
<td>CF1212.01 Plug Sensor Housing pH-ORP</td>
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<tr>
<td>140</td>
<td>JT0001 O-Ring VDU Base</td>
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<tr>
<td>150</td>
<td>CF1210.09 VDU DataLink Cable</td>
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# 7.4 CF1580-W1 Kit Valve 1.5” S80 White

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<th>PART</th>
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<tr>
<td>10</td>
<td>BO1215.03 Valve Spring 1.5 Inch</td>
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<tr>
<td>20</td>
<td>CHC-M6x20 Screw M6x70mm</td>
<td>2</td>
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<tr>
<td>30</td>
<td>CHC-M6x30 Screw M6x30mm</td>
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<td>40</td>
<td>ETH-M6 Nut M6</td>
<td>6</td>
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<tr>
<td>60</td>
<td>W-6X14 Washer M6</td>
<td>6</td>
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<tr>
<td>60</td>
<td>PC1207 Kit Diffuser 1.5 Inch</td>
<td>1</td>
</tr>
<tr>
<td>61</td>
<td>BO12/15.21 Diffuser 1.5 Inch Gasket NBR</td>
<td>1</td>
</tr>
<tr>
<td>62</td>
<td>BO1200.10 Cotter Pin 1.6mm</td>
<td>1</td>
</tr>
<tr>
<td>63</td>
<td>JT0003 O-Ring VDU Base</td>
<td>1</td>
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<tr>
<td>64</td>
<td>W-32X1.5 Washer ID 32mm Th 0.6mm Nylon</td>
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<tr>
<td>64</td>
<td>CF1210.16 Positioning Disk Black</td>
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<tr>
<td>65</td>
<td>JT0006 O-Ring Housing Plug or Shaft</td>
<td>2</td>
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<tr>
<td>70</td>
<td>BO8015-W1 Kit Valve Housing 1.0 Inch S80 White</td>
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<tr>
<td>71</td>
<td>BO8035.04-W1 Valve Housing 1.5 Inch S80 White</td>
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<tr>
<td>72</td>
<td>BO1200.06 Sight Glass</td>
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<td>73</td>
<td>JT0012 Gasket Sight Glass</td>
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<tr>
<td>74</td>
<td>BO1200.04 Drain Plug</td>
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<td>75</td>
<td>JT0032 O-Ring Drain Plug</td>
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## 7.5 CF2080-W1 Kit Valve 2.0” S80 White

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<tr>
<td>10</td>
<td>BO0220.03 Valve Spring 2.0 Inch</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>CF2000.01-W1 Adapter 2.0 Inches White</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>CHC-M6x30 Screw M6x30mm</td>
<td>10</td>
</tr>
<tr>
<td>40</td>
<td>CHC-M6x60 Screw M6x60mm</td>
<td>2</td>
</tr>
<tr>
<td>50</td>
<td>CHC-M6x25 Screw M6x25mm</td>
<td>4</td>
</tr>
<tr>
<td>60</td>
<td>ETH-M6 Nut M6</td>
<td>10</td>
</tr>
<tr>
<td>70</td>
<td>W-6x14 Washer M6</td>
<td>6</td>
</tr>
<tr>
<td>80</td>
<td>PC1208 Kit Diffuser 2.0 Inch</td>
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<td>81</td>
<td>BO2220.21 Diffuser 2.0 Inch Gasket Enap</td>
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<tr>
<td>82</td>
<td>BO1200.10 Cotter Pin 16mm</td>
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<td>83</td>
<td>JT0009 O-Ring Adapter 2.0 Inches</td>
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<td>84</td>
<td>W-32X43H Washer ID 32mm Th 0.8mm Nylon</td>
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<td>85</td>
<td>JT0005 O-Ring Housing, Plug or Shaft</td>
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<td>86</td>
<td>CF1201.16 Positioning Disk Black</td>
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<td>90</td>
<td>BO8020-W1 Kit Valve Housing 2.0 Inch S80 White</td>
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<tr>
<td>91</td>
<td>BO8020.04-W1 Valve Housing 2.0 Inch S80 White</td>
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</tr>
<tr>
<td>92</td>
<td>BO1200.06 Sight Glass</td>
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</tr>
<tr>
<td>93</td>
<td>JT0013 Gasket Sight Glass</td>
<td>1</td>
</tr>
<tr>
<td>94</td>
<td>BO2000.04 Drain Plug</td>
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<tr>
<td>95</td>
<td>JT0022 O-Ring Drain Plug</td>
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</table>
7.6 SO490x Kit Sensor SE pH+ORP

- SO4902: Sensor SE pH+ORP Platinum
- SO4903: Sensor SE pH+ORP Gold

<table>
<thead>
<tr>
<th>No</th>
<th>PART</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>SO490x Sensor SE pH+ORP</td>
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<tr>
<td>20</td>
<td>CF1213-04 Nut for pH+ORP Sensor</td>
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</tr>
<tr>
<td>30</td>
<td>CF1213-02 Grip Washer for pH+ORP Sensor</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>CF1213-03 Double compressor for pH+ORP Sensor</td>
<td>1</td>
</tr>
<tr>
<td>50</td>
<td>JT0602 O-Ring pH+ORP Sensor</td>
<td>1</td>
</tr>
</tbody>
</table>
7.7 DECAL AND MARKINGS LOCATION DIAGRAMS

7.7.1 CCU Decals and Markings

Figure 59 - CCU Decals and Markings

7.7.1.1 CCU Faceplate Decal
Affixed externally on the cover, and includes the following information:
1. Equipment name and model number;
2. Manufacturer’s name and contact information (address, website, supplier);
3. Electrical requirements; volts, amps, and Hertz;
4. Maximum external load rated in volts and amps;
5. Caution statements and icons; and
6. Replacement sensor model numbers.

7.7.1.2 Battery and Fuse Rating Marking
Marked on the PCB Power Supply adjacent to the F3 battery fuse: BATT, 12VDC, 5x20mm cart. 2A Fast Blow, etc.

7.7.1.3 Battery Decal
Affixed internally on the battery cover: Battery 12V 1.2Ah VRLA (UL94:V0)

7.7.1.4 Standby Decal
Affixed externally on the left side of the CCU, below the switch button: standby icon

7.7.1.5 Supply and High Voltage Marking
Marked on the PCB Power Supply adjacent to the power cord connector: 115V 230V, LE N, triangular high voltage warning icon, etc.

7.7.1.6 Power Fuse Rating Marking
Marked on the PCB Power Supply adjacent to the F1 and F2 power supply fuses: 5x20mm cartridges 160mA Slow Blow (230VAC) 315mA Slow Blow (115VAC)

7.7.1.7 Relay Output Max Rating Decal
Affixed internally to the Auxiliary Relays: Relay Output Max Rating 24VAC 6A

7.7.1.8 CCU Date of Manufacture Decal
Affixed externally on the left side at the bottom centered above the CCU Serial Number Decal: product date of manufacture

7.7.1.9 CCU Serial Number Decal
Affixed externally on the left side at the bottom, centered on the enclosure: product serial number
7.7.1.10 IP and Standby Mode Decal
Affixed externally on the left side at the top, centered on the enclosure.

7.7.2 VDU Decals and Markings

![Figure 60 - VDU Decals and markings](image)

### 7.7.2.1 VDU Keypad Decal
Affixed to the cover (under the lid) and includes the following information:
- Working Pressure
- See manual for operating instructions
- DO NOT OPEN caution
- Serviced and maintained by professional service personnel caution

### 7.7.2.2 VDU Serial Number Decal
Affixed inside the base on the right side just below the lip of the base, centered at the 3 o’clock (90°) position.

**NOTE:**
The product serial number is the CCU’s serial number. The VDU serial number is for maintenance reference only.

### 7.7.2.3 NSF CCS 20628 and NSF Electrical Logo Decal
Affixed inside the base on the right side just below the lip of the base, at the 5 o’clock (150°) position.

### 7.7.2.4 IP and Standby Mode Decal
Affixed inside the base on the right side just below the lip of the base, at the 2 o’clock (60°) position.
## Section 8  **TECHNICAL SPECIFICATIONS**

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8.1 POOLCOP EVOLUTION

Components

<table>
<thead>
<tr>
<th>Component</th>
<th>1.5” SG</th>
<th>2.0” SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Data Unit (VDU)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>pH Sensor Housing</td>
<td>Supplied</td>
<td>Supplied</td>
</tr>
<tr>
<td>Control Connection Unit (CCU)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Control Connection Unit Protection</td>
<td>IPS4</td>
<td>IPS4</td>
</tr>
<tr>
<td>PoolCop Base Gasket</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Long Allen screws, nuts and washers</td>
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<td>Short Allen screws, nuts and washers</td>
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</tr>
<tr>
<td>Diffuser with valve gasket 1.5”</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Diffuser with valve gasket 2.0”</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Adapter 2”</td>
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<tr>
<td>Allen screws</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Installer and User Guide</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Technical Specifications

- **CCU Dimensions**: 375 cm x 120 cm x 285 cm ; 4.3 Kg
- **VDU Dimensions**: 240 cm x 260 cm x 270 cm ; 3.2 Kg
- **Power Supply**: 120VAC, 60Hz
- **Current (Primary)**: 150mA
- **Current (Secondary)**: 2A
- **Battery 12V SLA**: YUASA Y1.2-12FR
- **1 x Pump + 7 Auxiliaries**: 6A - 24VAC
- **Communications Port**: RS 232
- **Temperature Sensor**: 0 - 45°C
- **pH Sensor**: 6.2 - 8.2
- **ORP Sensors**: 0 - 999mv
- **Pressure**: 0 - 250kPa
- **Safety Features**: Loss of power supply AC (battery 12V SLA); no water; low pressure; high pressure; lightning protection
- **CCU IP Rating**: IP54
- **VDU IP Rating**: IP54
- **Conformity**: NSF50 CCS 20628, UL, ULC, CE, including Low Voltage Directive (LVD)

Valve Performance US Units

Valve Performance Metric Units
8.2 AIR TEMPERATURE SENSOR

Components
Air Temperature Sensor with cable.

Technical Specifications
<table>
<thead>
<tr>
<th>Component</th>
<th>1.5&quot;</th>
<th>2.0&quot;</th>
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</thead>
<tbody>
<tr>
<td>Cable</td>
<td>4.5m</td>
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<tr>
<td>Temperature Range</td>
<td>-30°C/65°C</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>±2 °C</td>
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</table>

8.3 FLOW SWITCH

Components
Flow Switch Sensor with cable.

Technical Specifications
<table>
<thead>
<tr>
<th>Component</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Cable</td>
<td>2m</td>
<td></td>
</tr>
<tr>
<td>Temperature Range</td>
<td>5°C/50°C</td>
<td></td>
</tr>
<tr>
<td>Service Pressure</td>
<td>10 Bar (145 psi)</td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td>IP65</td>
<td></td>
</tr>
<tr>
<td>Flow sensing</td>
<td>Approx. 3.6m³/h (16 gpm)</td>
<td>Approx. 6.6m³/h (29 gpm)</td>
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8.4 PH+ORP SENSORS

Components
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<thead>
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<th>pH+ORP Pt</th>
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<td>pH+ORP sensor</td>
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<td>Transport Cap</td>
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<tr>
<td>Grip Washer</td>
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<tr>
<td>Black Compression Ring</td>
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<tr>
<td>White Compression Ring</td>
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<tr>
<td>O-Ring</td>
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Technical Specifications
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<tr>
<th>pH+ORP Pt</th>
<th>pH+ORP Au</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>12 mm</td>
</tr>
<tr>
<td>Length</td>
<td>14 cm</td>
</tr>
<tr>
<td>Cable, length</td>
<td>3 strands, 35cm</td>
</tr>
<tr>
<td>Connector</td>
<td>JST XHP-3</td>
</tr>
<tr>
<td>pH Range</td>
<td>4 - 12</td>
</tr>
<tr>
<td>pH Accuracy</td>
<td>+/- 0.05</td>
</tr>
<tr>
<td>ORP Range</td>
<td>0 - 999 mV</td>
</tr>
<tr>
<td>ORP Accuracy</td>
<td>+/- 5 mV</td>
</tr>
</tbody>
</table>

8.5 WATER LEVEL CONTROL

Components
Water level sensor.

Waterline Kit
<table>
<thead>
<tr>
<th>Component</th>
<th>1 sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solenoid valve</td>
<td>1</td>
</tr>
<tr>
<td>PVC saddles 50mm</td>
<td>1</td>
</tr>
<tr>
<td>PVC saddles 63mm</td>
<td>1</td>
</tr>
<tr>
<td>90° PVC connector (20mm to 20mm)</td>
<td>1</td>
</tr>
<tr>
<td>Straight PVC connector 20mm</td>
<td>2</td>
</tr>
<tr>
<td>Non-return valve, brass</td>
<td>1</td>
</tr>
<tr>
<td>Stop valve 15mm</td>
<td>1</td>
</tr>
<tr>
<td>Reducing connector (20mm to 15mm)</td>
<td>1</td>
</tr>
</tbody>
</table>

Buffer Tank Kit
<table>
<thead>
<tr>
<th>Component</th>
<th>4 sensors</th>
</tr>
</thead>
</table>

Technical Specifications
<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Sensor</td>
<td>5VDC, conforms Low Voltage Directive (LVD)</td>
</tr>
<tr>
<td>Output valve</td>
<td>24 VAC</td>
</tr>
<tr>
<td>Service pressure</td>
<td>3.5 Bars</td>
</tr>
<tr>
<td>Cable length</td>
<td>20m</td>
</tr>
<tr>
<td>Height</td>
<td>70mm</td>
</tr>
<tr>
<td>Width</td>
<td>45mm</td>
</tr>
<tr>
<td>Deep</td>
<td>15mm</td>
</tr>
</tbody>
</table>
8.6 XM8 Extension Module

**Components**
- XM8 Extension Module

**Technical Specifications**
- **Dimensions**: 140 cm x 98 cm x 195 cm; 0.8 Kg
- **Power Supply**: 12V - 300mA
- **Auxiliary channel 9 to 15**: 6A - 24VAC
- **Inputs 3 to 10**: 5 VDC
- **Protection**: IP55
- **Conformity**: UL, CE, including Low Voltage Directive (LVD)

8.7 Waste Backup Valve

**Components**
- **NC Valve**: 1
- **Control solenoid**: 1
- **PVC union set**: 2
- **63mm -> 50mm adapter**: 2
- **PVC saddle 63mm**: 1
- **PVC saddle 50mm**: 1
- **Vinyl tubing connection kit**: 1
- **Vinyl tubing**: 3m

**Technical Specifications**
- **Output solenoid**: 24 VAC
- **Service pressure**: 10 Bars
- **Membrane**: Nylon reinforced