



ANTI-DROWNING
SYSTEM
FOR POOLS





AngelEye



T

he growing popularity of fitness and recreation centres that house spa facilities as well as swimming and leisure pools has led to the creation of many aquatic parks and high-quality private and public pools that attract increasingly larger number of users.

The diversity of visitors forces the managers to organize their service offerings accordingly, upholding increasingly higher quality standards, while paying special attention to guarantee their clients a service that does not comprise any savings and has no minimum level: safety. It is in fact of the essence to give swimmers certainty, peace of mind, and the awareness of being in a facility where the safety level is high and one's safeness is constantly monitored as far as the greatest danger: drowning.

To protect the swimmers, the law provides supervision, with the help of qualified personnel monitoring the pools. This activity is somewhat difficult, as the bottom

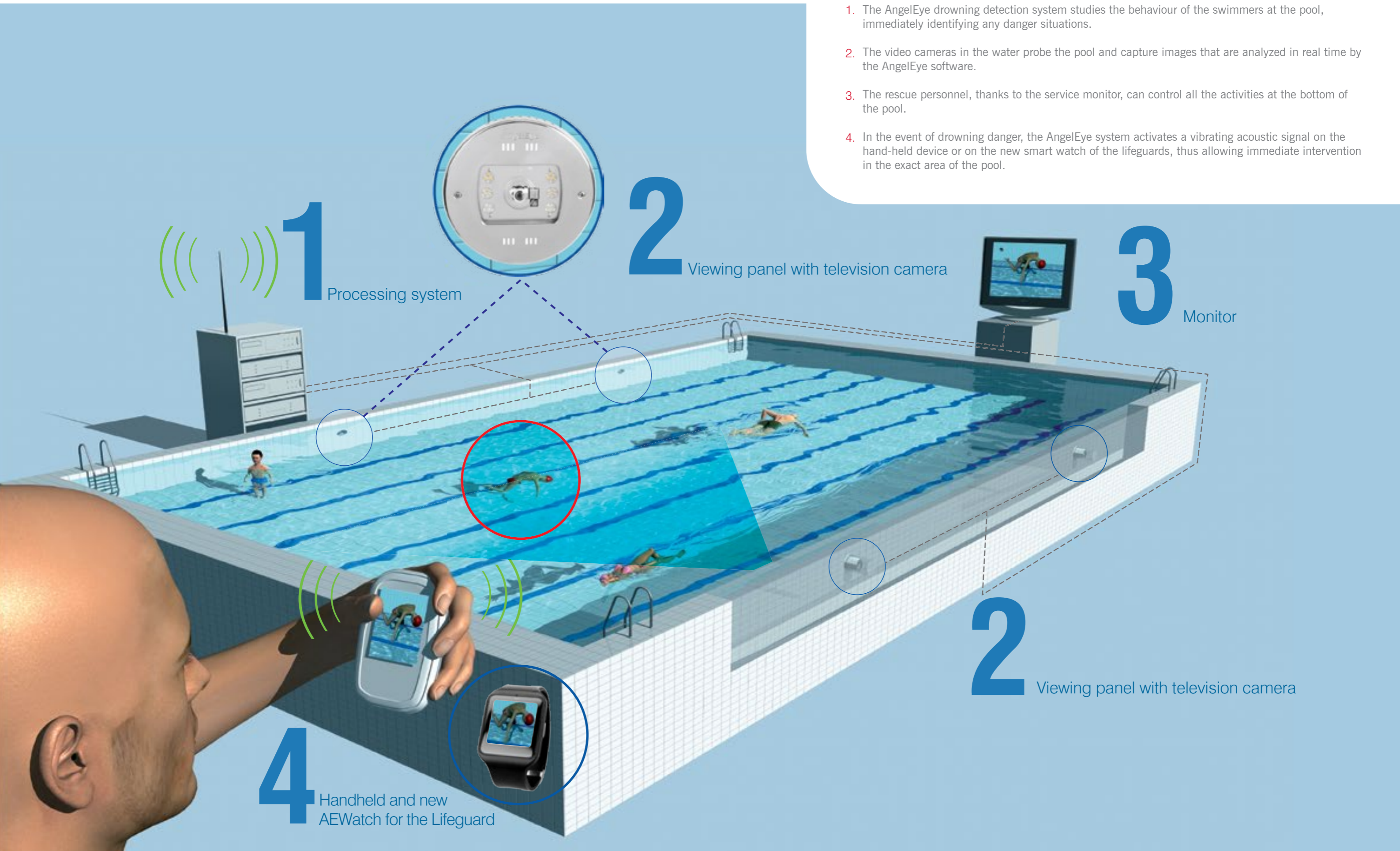
of the pool is difficult to see (because reflected light, waves, and floating swimmers do not always permit a full view of the activities at the bottom of the pool). Distraction is also a factor. To ensure that swimmers are safe and to provide the bathing facility with the highest safety level possible, we proudly introduce AngelEye LifeGuard.

AngelEye is a safety system specifically designed to control the activity of the swimmers in the swimming facilities; the system can evaluate dangerous situations and let the lifeguards know that there is an unsafe situation in progress.

This is accomplished by means of hand-held devices in a quick and effective manner, thus providing immediate and focused assistance. Thanks to the AngelEye new visual technology, a new lifeguard monitors all the activities at the pool, with no distractions!



1. The AngelEye drowning detection system studies the behaviour of the swimmers at the pool, immediately identifying any danger situations.
2. The video cameras in the water probe the pool and capture images that are analyzed in real time by the AngelEye software.
3. The rescue personnel, thanks to the service monitor, can control all the activities at the bottom of the pool.
4. In the event of drowning danger, the AngelEye system activates a vibrating acoustic signal on the hand-held device or on the new smart watch of the lifeguards, thus allowing immediate intervention in the exact area of the pool.





The implementation of the AngelEye drowning detection system is composed of three phases. First off, a layout design is developed according to the plan of the pools, a service performed at no charge by the AngelEye personnel. Carrying out the project calls for the installation on the walls of the pool of specific detection portholes designed by AngelEye, available in two models: deck hatch or niche portholes. Selecting the porthole that best suits a given type of pool is the job of the AngelEye designers, who work in synergy with the client. The last phase calls for the housing of the central unit and the associated connection to the detection and warning

devices of the AngelEye system. The designers will fine tune the system to make sure it works under any brightness and pool attendance conditions, up to and including the final testing and inspection. AngelEye also offers assistance and support services, which guarantee the clients constant controls on the correct functioning of the system and new functionality updates as they become available from the development team. The AngelEye system is compliant with privacy law requirements and can produce visual documentation of any critical situation detected.



Mobile Device e Wear

AngelEye can alert the LifeGuard in case of drowning recognition.

The alarms should arrive directly to the LifeGuard without alarming the people in the pool area and must be hearable in any situations of noises.

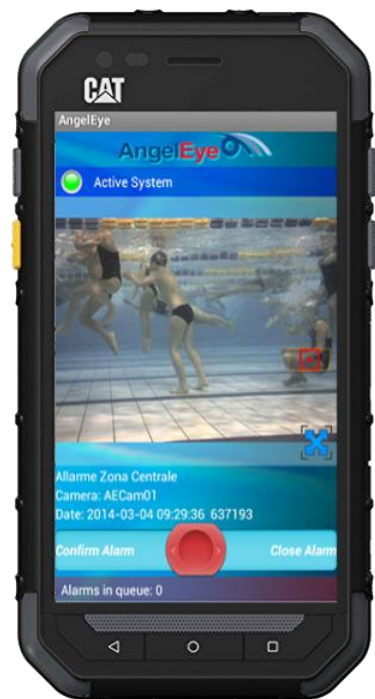
For doing that is available the App for Android and iOS able to alert immediately the LifeGuard, showing the picture of the alarm and the exact position in the swimming pool.

The Mobile device is water resistant and rugged.

The vibrating AngelEye Wear is a Smart Watch with all the functionalities of the Mobile Device, easy to wear.

It ensures that the alarm will be recognized by the LifeGuard.

The Smart Watch can be connected directly through wireless network.



TECHNICAL SPECIFICATIONS OF MOBILE DEVICE

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|----------------------------------|---|
| Embedded Operating System | Android 4.x or 5.x |
| CPU | MediaTek MT6577 - 1.000Mhz |
| Ram/Rom | 512Mbyte/3.7GByte |
| Display/Resolution | 4"/480x800 |
| Networks and Data Link | GSM850, GSM900, GSM1800, GSM1900, UMTS850 (B5), UMTS900 (B8), UMTS1900 (B2), UMTS2100 (B1) - GPRS, EDGE, UMTS, HSDPA, HSUPA |
| Interfaces | Expansion Slots: microSD, microSDHC, TransFlash USB: USB 2.0 client, 480Mbit/s, micro-USB, Bluetooth Wireless LAN: 802.11b, 802.11g, 802.11n GPS Services: Assisted GPS, QuickGPS, Geotagging |
| Camera | 5MP |
| Ingress Protection Level | IP67 |
| Protection | High level rugged |

ANGELEYE APP

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| Compatibility | Android (all the versions), iOS |
| Security | Multi level password |
| Language | Multi languages (8 languages available, ready for any languages) |
| Usability | Multi Touch layout |
| Alarm signal | Vibration, Visual Alarm, Audio Alarm configurable with personalized sounds and messages |
| Communication | Integrated VoIP system for communications between users and intercom |
| Drowning Alarm signalization | Picture of the Alarm, Maps Area with alarm position, text message, audio message |
| Software Upgrades | Automatic with self installation and configuration |
| Log system | Embedded with recording of all the activities |

TECHNICAL SPECIFICATION OF SMARTWATCH

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|----------------------------------|---|
| Embedded Operating System | Android >= 4.3 or 5.x |
| CPU | Quad ARM A7, 1.2 Ghz |
| Ram/Rom | 512 MB RAM, 4 GB eMM |
| Display/Resolution | 1.6" Transflective Display 320 x 320 pixe |
| Ingress Protecion Level | IP6 8 rate |
| Weight | Core unit 45g |
| Alert system | Vibration |

Underwater Camera-LED

AngelEye underwater Camera-LED represents the standard illumination system for swimming pools, with the powerful ability to acquire real-time images to be analyzed by the AngelEye recognition software.

It can be mounted underwater in several modes and can be fitted with all the swimming pool types, included the ones with movable floors, bulkhead and with or without underwater illumination.

The device is compatible with all the newest standards and can be mounted in already present niches of underwater lights of third parts.

The base kit includes the LED light and can be upgraded afterwards with the Camera module.



TECHNICAL SPECIFICATIONS OF THE LED LIGHT MODULE

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| Description | The AngelEye 18-2.0 POWER LED underwater lights with integrated camera module made up of corrosion-resistant bronze with processor-controlled circuit board and PVC plate with dome are connected to a special underwater cable with CAT data cable connecting to the camera (5 m length). |
| Material | Main module: corrosion-resistant bronze. Stainless steel cover made of V4A (1.4404 / 1.4571) |
| LED-Colour | Daylight white : 6000 K |
| Further Information | The AngelEye underwater headlights are only suitable for underwater operations. Control of the monochrome underwater headlights is via the ON / OFF primary voltage switch of the headlight power supply. |
| Aperture diameter | 270 mm |
| Ø Approx. lifecycle | 50000 hourly lifecycle |
| Power / Voltage | 2,15 A 24 V / DC SELV |
| Protection class | III IP 68 |
| Performance | 48 W |
| Luminous flux | 8530 lm |
| Laser classification | EN 62471 Photobiological safety |
| Radiating angle | 80° horizontal, 60° vertical (mixed lense) |
| Safety | Conformal Coated LED modules with opto-electronic influences Temperature controlled LEDs |
| Dimensions | Diameter 250mm (Flat Version) or 270mm (Standard Version) |
| Protrusion | < 7mm (Flat Version), 30mm (Standard Version) |

TECHNICAL SPECIFICATIONS OF THE CAMERA MODULE

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| Model | Underwater 180° version and ultra wide angle version with 6MP color sensor |
| Lens | B016, B036 180° fisheye |
| Sensitivity | Color sensor: 0.1 lux (t=1/60s) • 0.005 lux (t=1/1s) Lowlight Exposure Optimization |
| Sensor | 1/1.8" CMOS, 6MP, progressive scan |
| Max. image size | 3072 x 2048 (6MP) |
| Max. frame rate | 30Fps. Used in AngelEye for recognition: from 2fps to 8fps |

DESCRIPTION OF THE KIT CAMERA-LED SYSTEM

Camera-LED Light System

Composed by underwater Main unit in Bronze with 18 LED light system, 6 meter of underwater special cable for power and data, External Flange in Stainless Steel, Box for dry area composed by power supply and accessories.

The module is compatible with most at all the underwater niches, otherwise an AngelEye niche is required.

Ready to be upgraded to Full LED Light and Camera System.

Camera-LED Light & Camera System

Composed by underwater Main unit in Bronze with 18 LED light system, 6 meter of underwater special cable for power and data, External Flange in Stainless Steel, Box for dry area composed by power supply and accessories, Camera Module with integrated fisheye lens and relative data transmission accessories.

The module is compatible with most at all the underwater niches, otherwise an AngelEye niche is required

Camera-LED Upgrade from Light to Full Light & Camera System

Camera Module with integrated fisheye lens and relative data transmission accessories, to be easily installed in the Camera-LED Light System.

The Installation can be done in 5 minutes without empty the water from the pool and without changing any other component.

AngelEye's new application module is able to constantly communicate with the components that are typically installed in a swimming pool; its function is therefore to prevent false alarms.

Factors that inhibit drowning detection are often to be attributed to equipment as well as accessories that have an influence on the visibility in the pool: bridges and moving floors, underwater lighting, blinds diffusing sunlight, etc.

AngelEye Noise Suppression is connected to external devices, which send out a signal when activated.

Therefore AngelEye filters out all alarms that are not generated by genuine alarm situations.



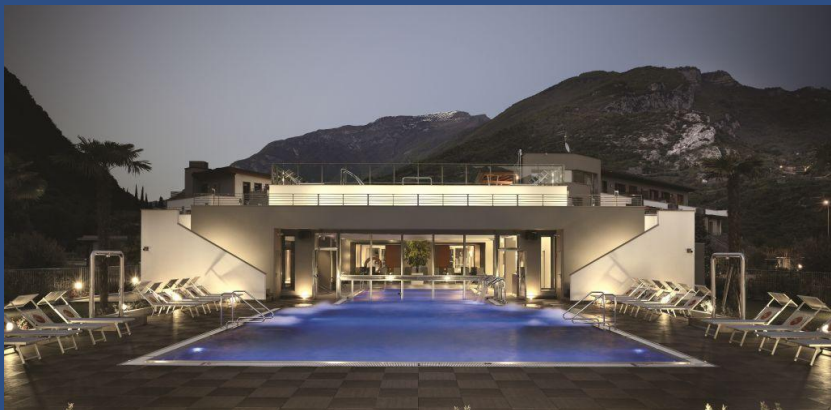
AngelEye Hotel is an alarm system aimed at pool drowning prevention in small commercial and residential pools.

The system works effectively using underwater cameras which incorporate special sensors and LED lights. The AngelEye software is able to analyze any unusual movements by pool users which may indicate a person requires assistance and may be at risk of drowning at which time the system will immediately alert lifeguards or responders.

AngelEye Hotel has been specifically created to meet the typical requirements of hotels with their pool safety firmly in mind.

Installation is simple and allows for the replacement of any pre-existing underwater lights with the new LED-inbuilt devices.

The system-generated alarms can be sent out to the most modern devices such as personal computers, tablets and smartphones.



Technical Specifications

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|---------------------------------|---|
| Typical Customer | This solution is exclusively designed for hotels, residences, spas, therapeutic centres. |
| Pool Types | All types of pool, including those made of steel, tiles, PVC and fiberglass. |
| Pool Size | From a minimum length of 5 meters up to a maximum of 18, with rectangular or irregular shapes . |
| Number of Camera Devices | From a minimum of 1 up to a maximum of 4, depending on both the pool's technical features. |
| Underwater Device Types | LED-lights with integrated safety sensors and video cameras, which one can install to replace pre-existing lights. |
| Central Control Unit | This is made up of all suitably-configured hardware and software components the system needs to function, in 2 different versions: <ul style="list-style-type: none"> - Basic, for operating 1 or 2 camera devices - Standard, for operating 3 or 4 camera devices |
| LED Lighting | Each underwater device includes – on top of the sensors and drowning alarm equipment – one set of long life, white LED lights. |
| Installation | <p>The installation is care of the client and can be carried out with the help of local technicians.</p> <p>AngelEye delivers pre-configured systems so as to be operational as soon as the installation is finished.</p> <p>Technical support by AngelEye – round-the-clock on demand – can guide personnel through the installation phases as well as provide all the necessary technical documentation.</p> <p>The installation method for underwater devices is akin to that of all pool lights; therefore, it is easy to implement by the abovementioned technicians.</p> <p>Underwater devices come with niches and can be installed in any available niche devoted to pre-existing lights; in this case, no invasive interventions to the pool are needed.</p> |

Standard Equipment

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| Standard Equipment for All Versions | <ul style="list-style-type: none"> - Pre-installed and configured central unit together with hardware and software (<i>Basic or Standard version</i>); - Underwater device together with safety video camera plus drowning detection sensors, Inbuilt LED-light, 10 meter underwater cable, Housing niche for the pool or adapting systems for pre-existing niches, IP56 box for electric and data connections (<i>quantities vary depending on version</i>) - 2 App Android and iOS licenses for managing alarms |
| Maintenance Service | <p>Maintenance yearly fee, starting day on the date of activation, which includes:</p> <ul style="list-style-type: none"> - Faulty parts replacement via the “Assistance Center” mode - software updates - Noise Reduction System (NRS) service |

Versions

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|-------------------|--|
| XS Version | For managing very small pools, up to 5 meters long, made up of: <ul style="list-style-type: none"> - Basic Version Central Unit - 1 Underwater device |
| S Version | For managing smallish pools, up to 9 meters long, made up of: <ul style="list-style-type: none"> - Basic Version Central Unit - 2 Underwater Devices |
| M Version | For managing medium-sized pools, up to 14 meters long, made up of: <ul style="list-style-type: none"> - Standard Version Central Unit - 3 Underwater Devices |
| L Version | For managing large-sized pools, up to 18 meters long, made up of: <ul style="list-style-type: none"> - Standard Version Central Unit - 4 Underwater Devices |





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