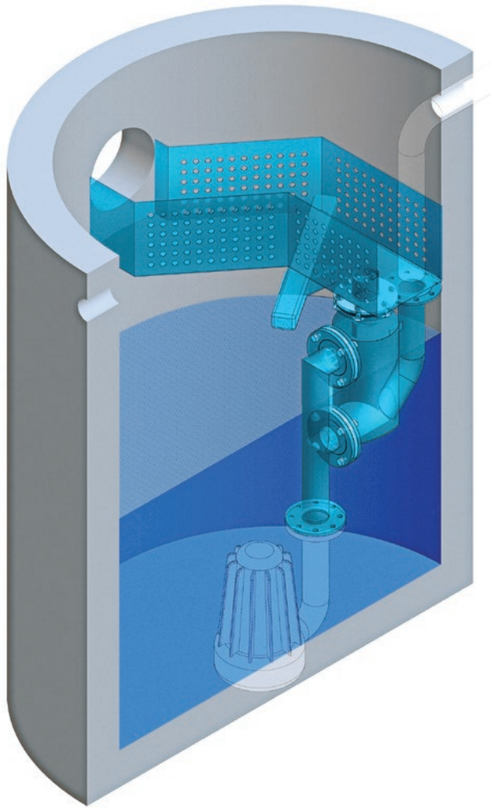
PUMP PROTECTOR®
Made by AQUA4UM

Pump Protector™ device is a protected utility model of Aqua4um s.r.o., registered in the Industrial Property Office of the Slovak Republic, under utility model no. 8245.

- **Pump Protector™** ensures that a pump does not get into contact with particulate matter that cause the pump's excessive wear, mechanical damage, plugging, and failure.
- **Pump Protector™** in gravitational inflow of wastewater into a PS, the Pump Protector separates particulate matter, accumulates it temporarily, and following the switch-on of the pump, it enables that particulate matter is forced into the lifting pipe, through which it is further delivered into sewage collection system and/or wastewater treatment plant.
- **Pump Protector™** can be installed into wet chambers of new as well as majority of existing pumping stations with no construction alterations needed!
- **Pump Protector™** enables upgrading of a pumping station with the use of original pumps, if they are technically fit for their purpose, which reduces investment costs to minimum.



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Our company offers:

- Designing in the area of water resources management (drinking water treatment works, wastewater treatment plants, utility networks – water supply networks, sewage systems, pumping stations), all stages of design documentation including rules of operation and handling instructions;
- A full delivery and installation of construction, machinery, and electrotechnical parts of new pumping stations, as well as, refurbishment/upgrading the capacity of existing pumping stations, wastewater treatment plants, and drinking water treatment works;
- Engineering;
- Advising in the area of operational optimisation of installations in the area of hydraulic engineering.

The company develops and installs a wide range of pumping stations technology and control systems:

- from the simplest pumping stations containing pumps and lifting pipe with on-site automated control with the use of floating switches;
- through a standard pumping stations containing pumps, lifting pipes, ladders, operating platforms with on-site automated control with pumping station failure and status signalisation in a computer and/or cell phone with the possibility of remote control of basic functions;
- up to the most comprehensive solutions enabling pumps' control by means of frequency converters, based on a continual measuring of the level with smart control via the central intelligence controlling.

Aqua4um s.r.o.
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Pumping station (PS) is used in sewage collection systems, it is designed for wastewater pumping into a higher sewer network or wastewater treatment plant due to terrain characteristics. More than 90% PSs in the Slovak Republic are „wet pumping stations" bringing many disadvantages e.g.:

- Pump plugging (reduced life-cycle);
- Frequent maintenance necessary (labour intensive cleaning of a PS, deteriorated hygienic conditions for maintenance personnel);
- Increased operating and maintenance costs of a PS;
- Environmental impact.

For the above problems to be eliminated our company has developed Pump Protector™, a device enabling to upgrade your ordinary pumping station to a pumping station of the future.

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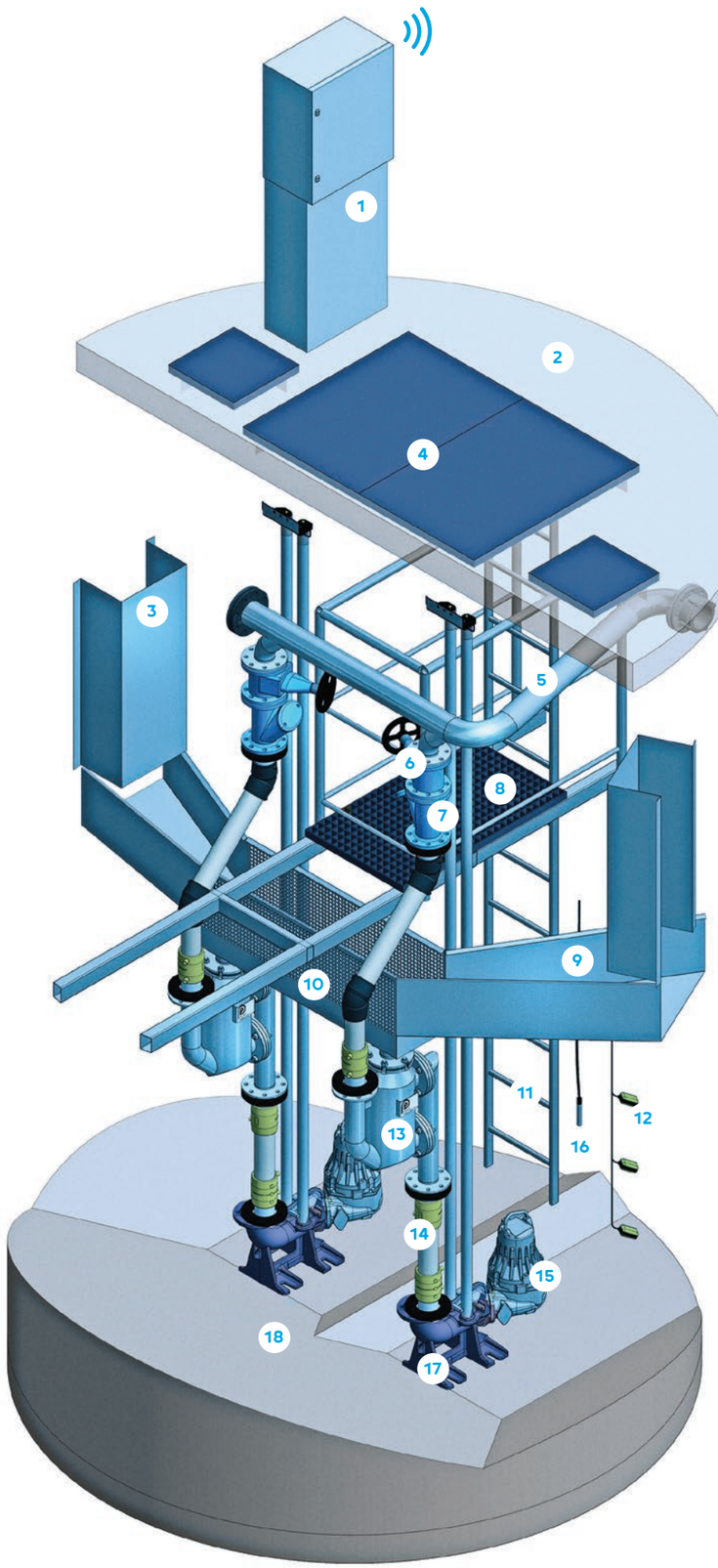
Following the installation of Pump Protector™ significant cost reduction is achieved, the costs associated with the operation of a PS, due to:

- **decreased number of PS calls** for pumps cleaning, maintenance, and service;
- **prolonged life-cycle of pumps;**
- **less frequent servicing of pumps;**
- **reduced power consumption;**
- **increased long-term effectiveness of pumps;**
- **no need to use rakes,** which is beneficial in terms of ecological impact on environment around the pumping stations.



Central intelligence controlling:
- controls from remote location operation of a PS by means of a switchgear

Cell phone or computer:
- receiving status messages on a PS
- controlling the basic functions of a PS

1. **Electrical switchgear:**
   - controls operation of pumps based on the level monitoring in a PS
   - evaluates condition of pumps
   - sends error message to a cell phone or computer
   - communicates with central intelligence controlling
2. **Ferro-concrete cover**
3. **Wastewater feed from sewage collection system**
4. **Opening covers**
   - material: stainless steel, steel, composite
   - pumps are inserted/removed through the covers in servicing or cleaning
5. **Lifting pipe**
   - delivering wastewater from a pump
   - material: stainless steel, HDPE
6. **Sluice valve**
   - is designed to close lifting pipe in the case of clap valve failure
7. **Spherical clap valve**
   - prevents wastewater reverse flow from the pumping set connected in parallel and/or top of the lifting pipe, back to a PS
8. **Operating platform with rail**
   - material: stainless steel, composite
9. **Inflow trough**
   - channels wastewater inflow into inflow perforated trough, its shape depends on the design of a PS, in some cases it is not necessary
10. **Inflow perforated trough**
    - channels wastewater inflow into Pump Protector™, its shape and functional design depend on the PS's design and type of sewage system, in which the PS is installed (single, separated)
    - material: stainless steel
11. **Ladder**
    - material: stainless steel, composite
12. **Floating switches**
    - are designed for setting of switch-on/ switch-off levels of pumps
13. **Pump Protector™**
    - separates particulate matter and prevents its contact with the pump's impeller
    - material: stainless steel
14. **Bidirectional pipeline**
    - material: stainless steel, HDPE
15. **Pump**
    - pumps wastewater into a lifting pipe
16. **Pressure sensor**
    - serves for continual measuring of the level in a PS
17. **Rest bend**
    - is designed for anchoring and installation of a pump through the cover of a PS
18. **Formed bottom of a pumping station**