

# PRIME 7



CE

WWTP is certified  
according to  
EN 12566-3



## SUITABLE FOR

Family houses, holiday homes, guest houses, small production facilities with biological waste.



## STANDARD VERSION

Switch clock, inflow chamber, bioreactor, sludge trap, blower, equipment for discharge of treated water.



## PATENT PROTECTION

TOPAS purifying method (P.No. - 307 806)



## METHODS OF DISPOSAL AND USE OF WASTEWATER

Discharge to groundwater or surface water, or reuse of water for garden watering, toilets, etc.



## WWTP LEGISLATIVE REQUIREMENTS

- 1) The WWTP meets the requirements of the Groundwater Directive (2006/118/EC).
- 2) The WWTP meets the requirements of Council Directive concerning urban waste water treatment (91/271/EEC).

# FUNCTIONAL DESCRIPTION

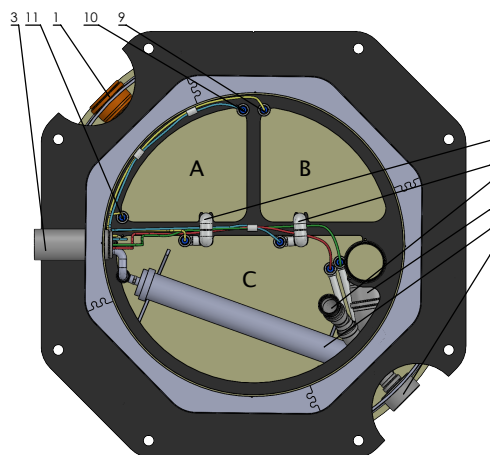
## PRINCIPLE OF WWTP FUNCTION

The wastewater treatment plant works on the principle of wastewater treatment using activated sludge floatation. Air, which is necessary for life of microorganisms, is supplied by a membrane blower located outside the treatment plant. The blower, along with the three-way valve, is also used to drive pumps that transfer water between individual chambers. The treatment process is controlled by a switch clock with a preset program.

### TECHNOLOGY DESCRIPTION

- A Inflow chamber
- B Sludge trap
- C Bioreactor

1. Entrance
2. Exit
3. Pneumatic Armature Inlet (Compressor)
4. Air Flow Regulator
5. Emergency Exit
6. Aerator
7. Sludge Airlift
8. Recirculation Airlift
9. Coarse Bubble Aerator (Sludge Trap)
10. Coarse Bubble Aerator (Inlet Chamber)
11. Fine Bubble Aerator (Inlet Chamber)



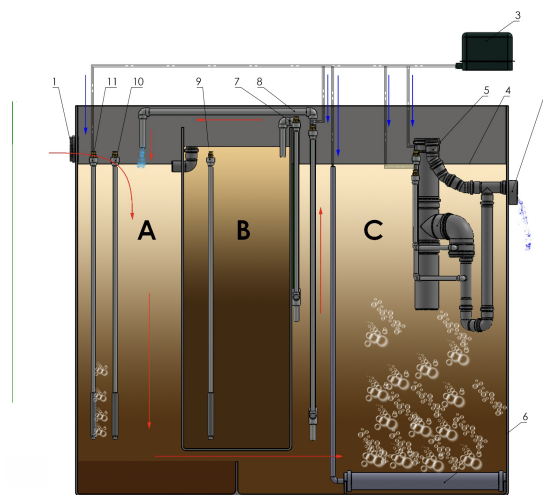
WWTP PRIME 7 plan view

## WASTEWATER TREATMENT PROCEDURE

The purification technology is controlled by a switch clock, which has the following treatment phases programmed for the PRIME WWTP:

### 1. Bioreactor Filling and Aeration Phase

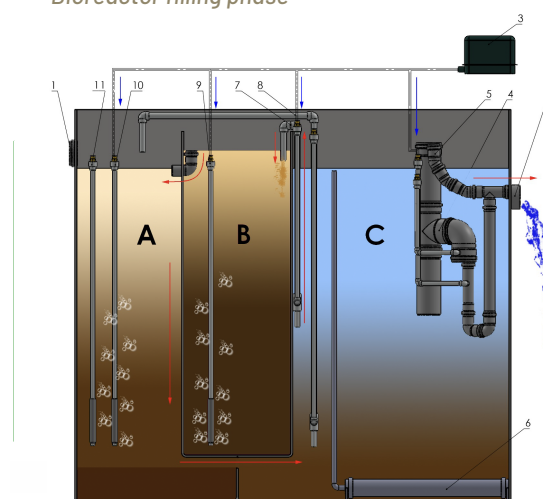
Wastewater flows into the inlet chamber (A), where fine bubble aeration prevents the formation of hard scum on the water surface and where heavy waste particles settle. Then it passes through its bottom opening into the bioreactor (C). The bioreactor and the influent chamber form hydraulically 'connected vessels'. In the bioreactor (C), the biological treatment of wastewater is carried out by microorganisms dispersed in the up-flow, nitrification processes, and other biochemical processes using dissolved oxygen. Activated sludge is mixed with wastewater using pressurised air. The bioreactor (C) is aerated, which disrupts large waste particles, toilet paper, and mixes wastewater. The activated sludge mixture is recirculated to the inlet chamber (A). The phase continues for a certain period determined by the timers.



Bioreactor filling phase

### 2. Sludge Removal and Water Discharge Phase

Aeration ends. Activated sludge starts to form a layer on the bottom of the bioreactor (C), separated from the layer of treated water, which is regularly pumped out of the plant. The settled sludge is pumped to the sludge trap (B), where coarse bubble aeration prevents the formation of scum from heavy sediments. Cleaner water, separated from settled sludge, then overflows from the sludge trap (B) to the inlet chamber (A), where coarse and fine bubble aeration ensures water flow, and the process repeats. Sedimentation lasts for a specified period. Then, the discharge is completed. The sludge pump and the controlled discharge system for clean water are in operation.



Discharge phase



## BASIC INFORMATION

The PRIME WWTP consists of a self-supporting circular plastic tank with an outer diameter of 1,20 (1,50) m and a total height of 1.8 (1.8) m. The treatment plant is placed in a pit so that the cover of the plant is at least 50 mm above the adjusted terrain. The WWTP comes from the factory equipped with inlet and outlet pipes DN 110 mm. The treatment plants are produced with an inlet with the depth of the pipe bottom at -345 mm and an outlet with the depth of the pipe bottom at -555 mm below the ground level. The inlet is always connected to the inlet chamber. The outlet also serves as a safety overflow.



*Installed WWTP PRIME 7*

## WWTP INSTALLATION PROCEDURE

### 1. Surface preparation

Under normal foundation conditions (i.e. with the groundwater level below the foundation joint), a pit (backfilled if necessary) is dug with dimensions of approx. 1.3 x 1.3m (for Prime 9: 1.6 x 1.6m) and a total depth of approx. 1.85 m. At the bottom of the pit, a compacted gravel-sand sub-base, at least 100 thick, shall be established. It is advisable to stabilise the sand sub-base 'dry' with cement or dry concrete mix. In case of unstable subsoil, the underlying concrete layer is set and reinforced with welded steel mesh if necessary. In any case, the foundation under the treatment plant shall be rigid and stable.

### 2. Installation of WWTP in the Pit

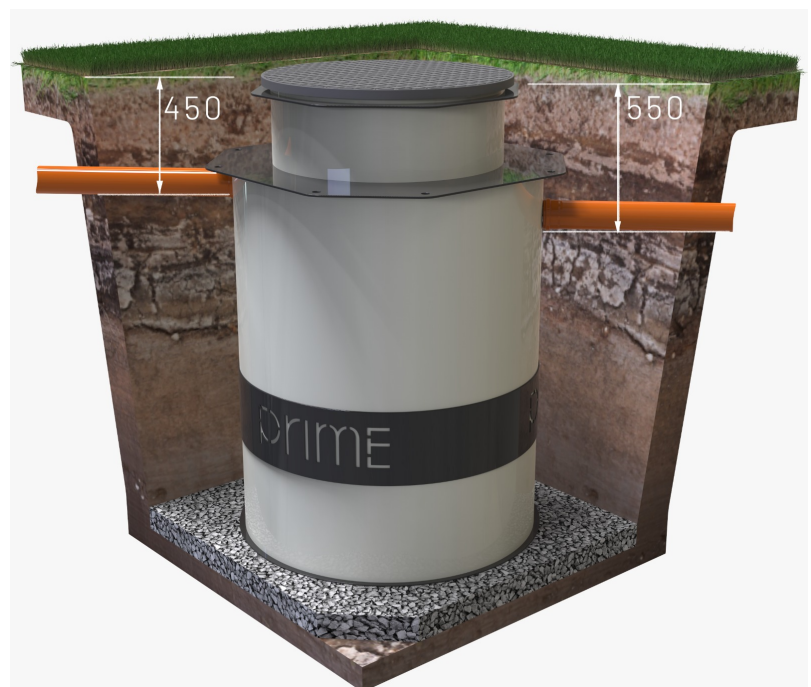
The treatment plant is installed on the prepared substrate. It can be installed manually or better mechanically. It should be ensured that the ground base under the treatment plant remains clean and free of stones etc. The plant must be installed with an accuracy of  $\pm 2$  mm. The horizontal alignment should be checked in correlation with water level on the lid of the plant. The tank shall then be backfilled with compacted gravel to the height of approximately 300 mm above the bottom of the tank, over the entire area of the excavation.

### 3. Inflow and outflow connections

The inlet is formed by a neck and is ready for connection to the inlet pipe. The outlet is formed by the smooth end of a DN 100 pipe with the depth of the pipe bottom at -555 mm below the ground level.

### 4. Backfilling and Filling the WWTP

After installation, the treatment plant is filled with water to a depth of about 1.0 m and then covered with sand or the original "swapped" soil, unless it contains stones larger than about 10 mm that could damage the plastic tank shell. The backfill under the inlet and outlet pipes must always be made with compacted gravel (preferably stabilised with cement) to avoid later settlement of the backfill, which could damage the stability of the pipes. After the treatment plant has been installed in the trench and the inlet and outlet pipes have been connected, the treatment plant is filled with water to the operating level of the bioreactor, approximately 1,4 - 1,5 m.



*PRIME 7 installation*

## 5. Electricity connection

The PRIME WWTP is certified, including the external electrical installation, which is located next to the treatment plant. Connection from the property is made with a CYKY 3J x 2.5 earth cable to the supply electrical box, performed by a qualified person who issues a revision report for the electrical connection and removes the provisional connection. It is essential to have a circuit breaker protecting the supply to the treatment plant.

## TECHNICAL CHARACTERISTICS

### TECHNOLOGY

Biological treatment of wastewater using the sequencing batch reactor (SBR) technology with activated sludge dispersed in suspension.

### TECHNOLOGY ADVANTAGES

- + Built-in separate sludge trap with aerobic sludge stabilization.
- + For recreational facilities without sewage inflow, biological function is guaranteed for at least 20 days.
- + External control unit is safe from flooding and damage due to rain, snow, or overflowing of the treatment plant.
- + Automatic sludge removal from the bioreactor.
- + Stable self-supporting circular plastic tank made of polypropylene.
- + Construction suitable for installation below the groundwater level.
- + Controlled discharge of treated water from the treatment plant.

### TECHNICAL SPECIFICATIONS

TYPE	PRIME 7
PE (Population Equivalent)	1-5
Inlet flow [m <sup>3</sup> /day]	0,75
BOD <sub>5</sub> load [kg/day]	0,30
Power consumption at 100% load [kWh/day]	1,44
Weight [kg]	120
Dimensions (diameter x height)[m]	Ø1,2 x 1,8

### EFFICIENCY ACHIEVED IN THE TEST ACCORDING TO EN 12566-3

Parameter	COD	BOD <sub>5</sub>	SS	P <sub>total</sub>	N <sub>total</sub>	N <sub>NH4</sub>
Efficiency	96 %	99 %	98 %	75%	79 %	86%

### GUARANTEED PARAMETERS of PRIME WWTP discharge into groundwater: <sup>1)</sup>

Parameter	COD	BOD <sub>5</sub>	SS	P <sub>total</sub>	N <sub>total</sub>	N <sub>NH4</sub>
Value [mg/l]	130	30	30	8	20	20

### GUARANTEED PARAMETERS of PRIME WWTP discharge into surface water: <sup>2)</sup>

Parameter	COD ("p")	COD ("m")	BOD <sub>5</sub> ("p")	BOD <sub>5</sub> ("m")	SS ("p")	SS ("m")
Value [mg/l]	110	170	30	50	40	60

1) Meets the requirements of the Water Framework Directive 2000/60/EC.

2) Meets the requirements of Council Directive concerning urban waste water treatment (91/271/ EEC).