

# TOPAS S 5-8



Certified according to  
EN 12566-3



## SUITABLE FOR

Family houses, recreational facilities, guest houses, small biowaste production facilities.



## STANDARD EQUIPMENT

Control unit, equalizing tank, bioreactor, sludge tank, blower, equipment for decanting of treated water (decanter).

## ADDITIONAL EQUIPMENT

Dosing for phosphorus precipitation, sand filter, UV lamp, GSM module.



## PATENT PROTECTION

Decanting equipment (EP-2552838)  
Method of wastewater treatment (CZ - 307 806)  
Sand filter (EP-2554230)



## TREATED WATER UTILISATION

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



## CONSTRUCTION

The treatment plant is made of polypropylene plastic boards. The tank has a stable **self-supporting** circular construction without the need for installation on a concrete slab and an **optional inlet** height. The construction is also suitable for installation **below the groundwater level**.



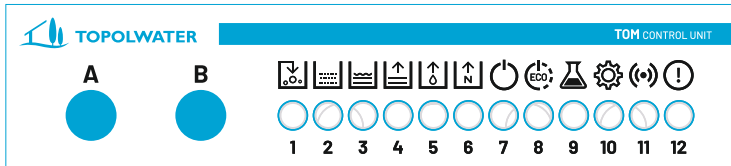
## PRIZE

GRAND PRIX at the For Arch 2018 trade fair in Prague for WWTP TOPAS with guaranteed function also for **recreational facilities**.

# FUNCTIONAL DESCRIPTION

## PRINCIPLE OF THE TREATMENT PLANT FUNCTION

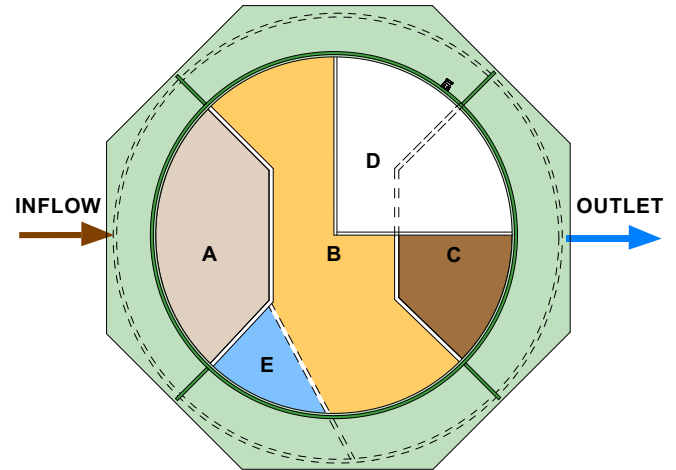
The treatment plant works on the principle of wastewater treatment using activated sludge in suspension. The air necessary for the life of the microorganisms is supplied by a membrane blower which is located directly in the treatment plant. The blower, together with the three-way valve is also used to drive mammoths which pump water between the individual tanks. The water treatment process is controlled by a control unit with a special program and data is transferred to the application on a mobile device (phone, tablet, laptop, etc.) via a WiFi connection.



TOM control unit

### DESCRIPTION OF TECHNOLOGY

- A** Accumulation
- B** Bioreactor
- C** Sludge tank
- D** Box with technology
- E** Sand filter



Floor plan of WWTP TOPAS S 5

## TECHNOLOGICAL PROCESS

### 1. Bioreactor filling phase

Wastewater flows into the accumulation tank and then is pumped by an air pump to the bioreactor where the biological treatment takes place. The bioreactor is aerated and the phase lasts until the level in the reactor reaches the filling level or the set time has elapsed.

### 2. Sedimentation phase

The blower is switched off during this phase. The sludge settles to the bottom in the bioreactor and the treated water is separated from the sludge layer. Sedimentation lasts for a set time.

### 3. Sludge removal phase

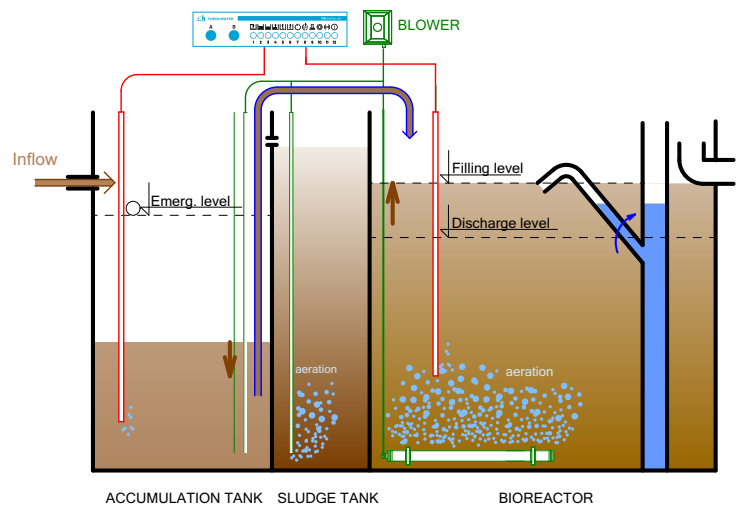
Excess sludge is pumped from the bioreactor to the sludge tank. The sludge removal lasts until the water level in the bioreactor is reduced by a set layer but not longer than the set sludge limit is reached.

### 4. Discharge phase

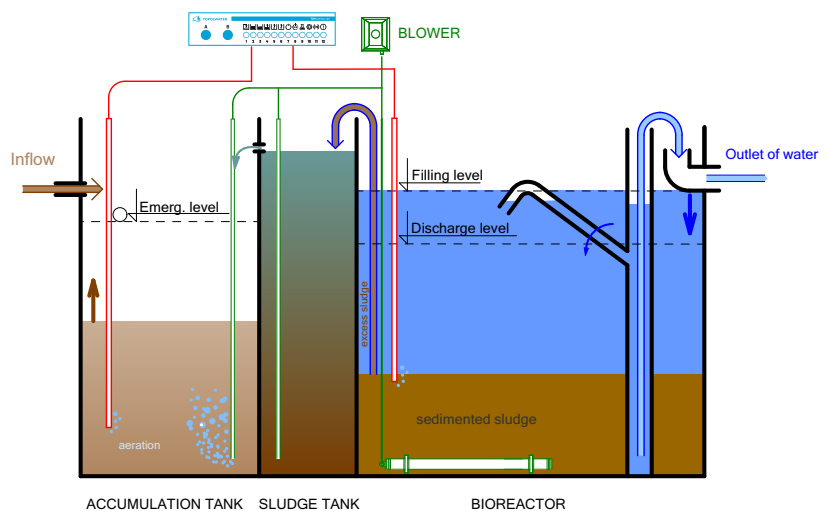
During this phase treated water from the bioreactor is pumped from the filling level to the discharge level until the discharge is completed. Water is pumped by an air-lift pump into a treated water container which has an overflow leading into the outlet or into a sand filter tank.

### 5. Recirculation phase

Part of water from the bioreactor is pumped into the sludge tank during recirculation and from there flows back into the accumulation tank. It is aerated at the same time. Recirculation phase lasts until the level in the bioreactor drops to minimum level.



Bioreactor filling phase



Sludge removal and discharge phases

## BASIC DATA

The WWTP Topas S 5(8) consists of a self-supporting circular plastic tank with an outer diameter of 1.2 m (1.5 m) and a total height of 2.3 m (2.3 m). The treatment plant is installed in the excavation so that the plant cover is min. 100 mm above the prepared terrain. Just below the lid there is a blower ventilation which must always be placed safely above the ground and secured against the ingress of rainwater. The WWTP is equipped from the factory with a pipe DN 110 mm at the outlet. The inflow is set up on site when the treatment plant is installed. The inlet leads into the accumulation tank which also has the function of a pumping station. There is therefore possible to install the inlet at different depths below the ground as needed in the range of 0.4-1.3 m below the ground.



WWTP TOPAS S 5 after installation

## INSTALLATION OF THE TREATMENT PLANT

### 1. Preparation of the base

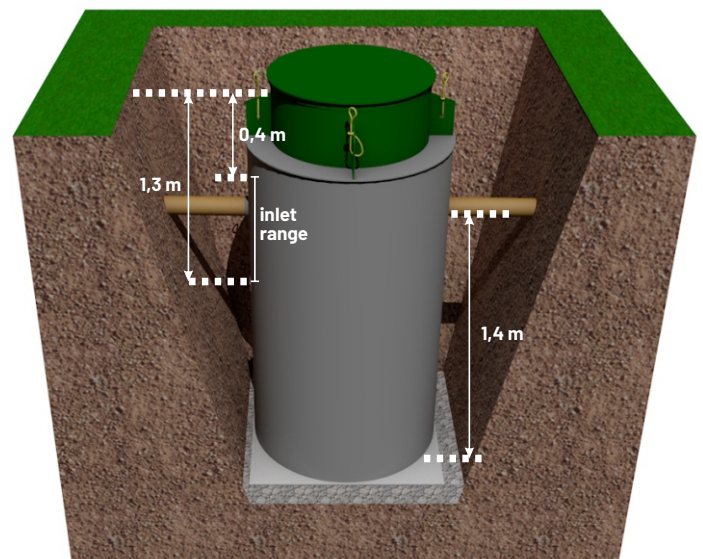
A pit (sealed as required) is dug with dimensions of approx. 1.3 x 1.3 m (for T8: 1.6 x 1.6 m) and a total depth of approx. 2.4m (under normal conditions for the WWTP foundation, ie with the groundwater level below the footing bottom). At the bottom of the pit, a compacted gravel-sand backfill with a thickness of min. 150 mm. It is advisable to stabilize the sand subsoil "dry" with cement or a dry concrete mixture. In the case of an unstable subsoil a base concrete is set up, which is reinforced with a welded steel mesh as required. The base under the treatment plant must in any case be solid and stable.

### 2. Installation of WWTP in the excavation

The treatment plant is installed on the base prepared in this way. It can be fitted manually or better by mechanization. When installing, care must be taken to ensure that the base under the treatment plant remains clean without stones, etc. The treatment plant must be installed with an accuracy of  $\pm 50$  mm. The horizontality of the installation is checked by a spirit level on the treatment plant lid. Subsequently, the tank is backfilled with compacted gravel to a height of approx. 300 mm above the bottom of the tank over the entire excavation area.

### 3. Inflow connection

The treatment plant is usually manufactured without an inflow pipe. The **inlet** is made on site in the depth range as shown. The connection of the inflow pipe can be realized either by welding the PP pipe to the tank of the plant or by the DN 110 pipe without the need for special weld. The fitting is delivered with the product. The **outlet** is formed by the smooth end of the DN 110 pipe at a depth of 0.7 m below the ground, ie 1.4 m above the bottom of the WWTP



Installation of WWTP TOPAS S

placing a special fitting for

### 4. Sprinkling and current filling

After installation, the treatment plant is filled with water to a depth of about 1.0 m and then sprinkled with sand or the original "swapped" soil if it does not contain stones larger than about 10 mm which could damage the plastic tank. The backfill under the inflow and outflow pipe connection must always be done through compacted gravel (preferably by stabilized cement) to prevent later settling of the backfill, which could damage the stability of the pipe. After settling the treatment plant in the excavation and connection of the inflow and outflow pipes, the treatment plant is filled with water to operating accumulation level of 0.7-1.2 m, activation between the lines on the sludge tank wall 1.6 - 1.8 m.

### 5. Electricity connection

TOPAS treatment plant is certified including internal wiring. To test the function during installation the treatment plant is equipped with a 230 V plug for temporary connection. The connection from the property with a CYKY3Jx2.5 ground cable to the acidur electrical supply box is carried out by a professionally qualified person who will carry out an inspection of the electrical connection and remove the temporary connection. It is essential that the supply to the treatment plant is protected by a circuit breaker.



## PRINCIPLE OF TECHNOLOGY

Biological wastewater treatment using activated sludge in suspension (SBR technology)

## TECHNOLOGY ADVANTAGES

- + An accumulation tank to compensate for irregular inflow
- + Built-in separate sludge tank with aerobic sludge stabilization
- + Biological function is guaranteed for at least 100 days for recreational facilities without sewage inflow
- + Automatic control of WWTP operation depending on the amount of inflowing wastewater (without user intervention)
- + Guaranteed efficiency up to 6 months without inflow
- + Automatic sludge removal from the bioreactor
- + Control unit with special software with WiFi connection and preparation for connection to a smart home
- + WWTP suitable for continuous monitoring, connected to the central room for control and management of the obtained data



## TECHNICAL SPECIFICATIONS

Type	TOPAS 5	TOPAS 8
Number of persons	1-5	2-8
Flow [m <sup>3</sup> /day]	0,75	1,20
Load BOD <sub>5</sub> [kg/day]	0,30	0,48
Power consumption energy at 100% load [kWh/day]	1,44	1,92
Weight (without sand filter)[kg]	180	250
Dimensions (diameter × height)[m]	Ø1,2 × 2,4	Ø1,5 × 2,4

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

Parameter	COD	BOD <sub>5</sub>	SS	P <sub>tot</sub>	N <sub>tot</sub>	N <sub>NH<sub>4</sub></sub>
Efficiency [%]	96 %	99 %	97 %	76% (99%) <sup>1)</sup>	81 %	85% (98%) <sup>1)</sup>

<sup>1)</sup> value achieved only with the TOPAS Plus variant

## MAXIMUM GUARANTEED PARAMETERS <sup>2)</sup>:

Parameter	COD	BOD <sub>5</sub>	SS	P <sub>tot</sub>	N <sub>tot</sub>	N <sub>NH<sub>4</sub></sub>
Value [mg/l]	130	30	30	8	20	20

<sup>2)</sup> applies to all types of WWTP TOPAS which are loaded to the designed capacity and operated in accordance with the operating manual

## AVERAGE PARAMETERS OF TOPAS Plus WWTP <sup>3)</sup>:

Parameter	COD	BOD <sub>5</sub>	SS	P <sub>tot</sub>	N <sub>tot</sub>	N <sub>NH<sub>4</sub></sub>
Value [mg/l]	30	8	8	0,2	-	0,5

<sup>3)</sup> TOPAS Plus is a comfortable variant of the treatment plant, which is equipped with a sand filter and dosing of chemicals