



# WASTEWATER TREATMENT PLANT

## AS-MONOcomp 2-50

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DESIGN & INSTALLATION DOCUMENTS



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# 1 Introduction

This documentation provides information and supporting documents for the design and/or installation of wastewater treatment plants (further as the WWTP) of the **AS-MONOcomp** type range. These documents are intended in, particular, for the persons:

- conducting the product (equipment) design,
- transporting the product (equipment), and
- carrying out the product (equipment) installation and builder's works in connection.

In all cases, it is logically assumed that such persons are professionally competent for the above-specified activities.

The documentation contains important instructions, information, and safety warnings.

***You are kindly requested to read this documentation thoroughly before you start with the design, installation, and any handling with the product (equipment). In case of any doubts, please do not hesitate to contact ASIO NEW, spol. s r.o.***

Very important instructions and notices are herein indicated graphically as follows:



***Any non-compliance with the instructions marked by this symbol may be hazardous to human health or property***



***Forbidden activities***



***Any non-compliance with these instructions may result in damaged product (equipment)***

***Other important instructions***

## 2 Product description

### 2.1 General

The WWTP AS-MONOcomp type range described in this manual involves WWTPs up to 50 PE (population equivalent) units meeting the requirements of the Czech Standard ČSN EN 12566-3 “Small wastewater treatment systems for up to 50 PE - Part 3: Packaged and/or site assembled domestic wastewater treatment plants” (current version). This is a biological treatment plant using the SBR treatment process. The integrated treatment process takes place in a single packaged unit (tank) comprising all the treatment processes. In case of larger sizes, the unit may be (optionally) extended with a tank for excessive sludge.

### 2.2 WWTP sizes and options

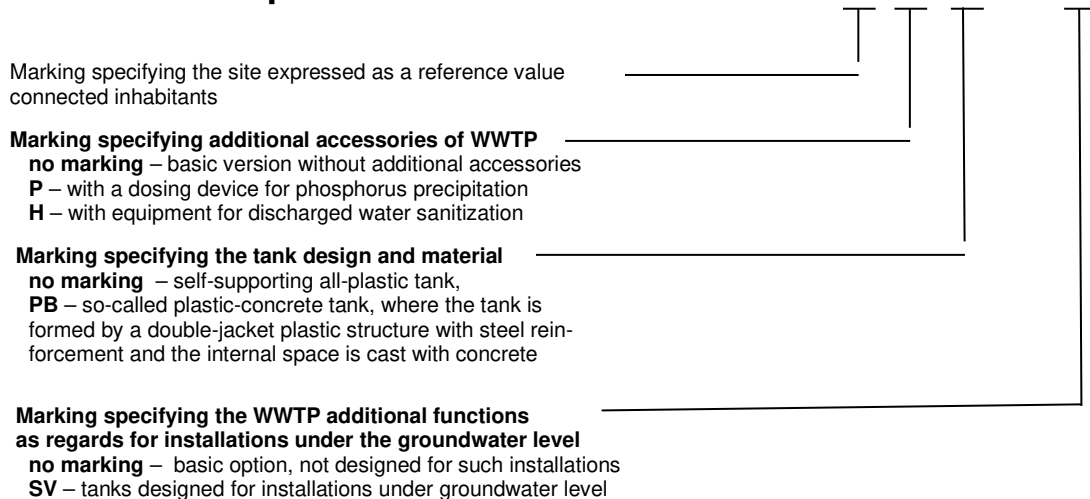
The type range of AS-MONOcomp is manufactured in individual sizes that differ one from another by their nominal daily flow rates and nominal daily organic loads, which equals to the number of people in connected facilities (i.e. PE = population equivalent); the individual options differ .

- Installation method and builder’s work in connection
- Additional accessories

Concrete WWTP designs in terms of sizes and options are specified according to the type marking.

### 2.3 Type marking diagrams

#### AS-MONOcomp ... .. / .....



NOTE: ... - basic marking (always used), -... additional markings used as necessary/applicable

#### Marking examples:

**AS-MONOcomp 4 K** - type plant intended roughly for max. 5 connected inhabitants, with a polyethylene plastic cylindrical self-supporting tank.

**AS-MONOcomp 12 P/PB-SV** - type plant intended roughly for max. 12 connected inhabitants, with a plastic-concrete cylindrical tank, suitable for installations, where the groundwater level is above the foundation slab level. The plant is equipped with the additional, phosphorus removal equipment.



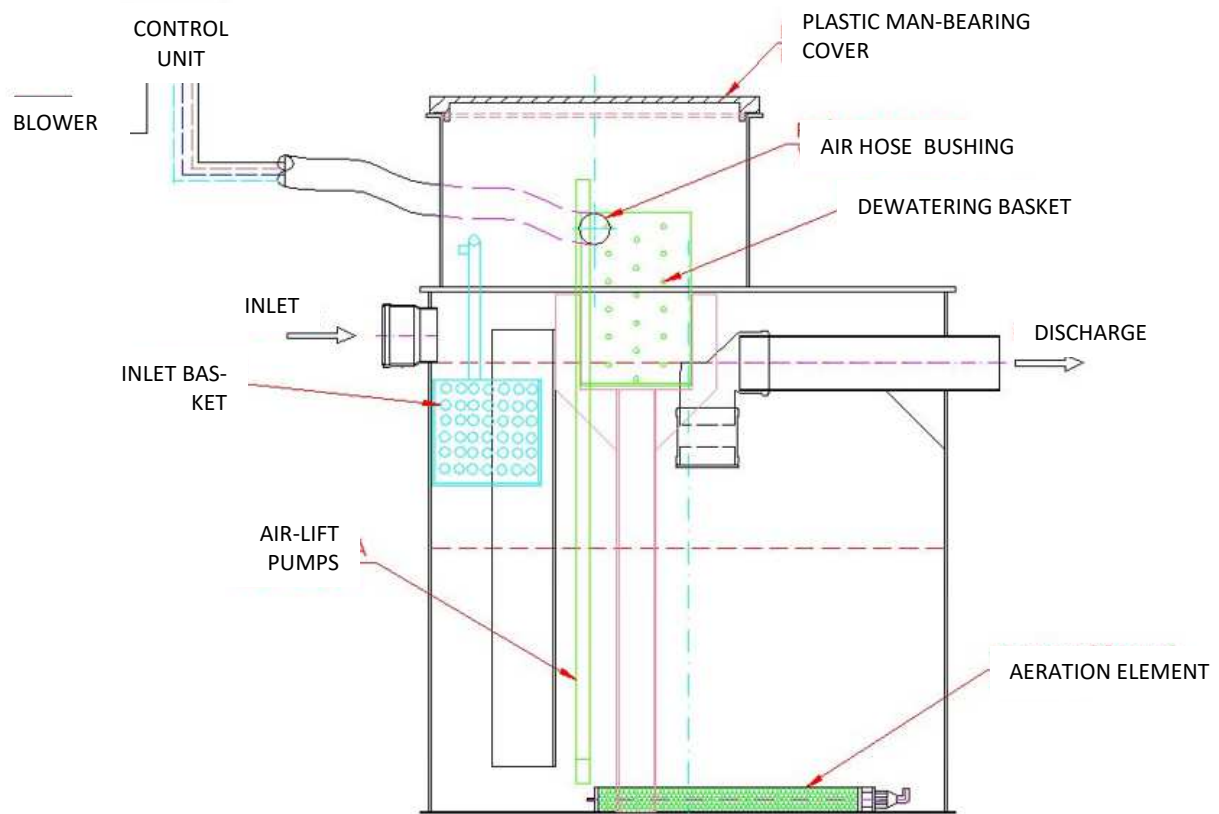
## 3 How the WWTP works

### 3.1 General

AS-MONOcomp is an activation aerobic wastewater treatment plant working on the SBR principle (further as the WWTP). Wastewater impurities are removed by mechanical-biological processes in the so-called SBR reactor. In this process, a simple tank and time-controlled purification cycle running during the day are employed.

### 3.2 Plant description

#### 3.2.1 Plant layout



#### 3.2.2 Construction

All the equipment parts are manufactured from materials suitable for the WWTP purposes – the airlift pumps and diffusers are suitable for their direct placement inside the tank, while the blower and the instrument panel are placed outside the tank area at a protected place (e.g. a garage, cellar or an outdoor electrical panelboard).

### 3.3 Description of plant functions

#### 3.3.1 Purification process

The plant purification process includes the following phases:

- (1) *Aeration phase* – during this phase aerobic purification processes take place. Floating microorganisms flocked to flocculi are removing organic impurities by aerobic degradation and convert them into biomass. In some purification phases, the aeration phase is adapted for the possibility of denitrification, where the active aeration takes turns with pauses.
- (2) *Sedimentation* – in this purification phase, the aeration is completely interrupted and flocculi in the tank are allowed to sediment. A clear interface is thus created between activated sludge and cleaned water.
- (3) *Cleaned water withdrawal* - in the time of separation of clean water from sludge, the airlift pump pumps it to the discharge.

#### 3.3.2 Other processes

##### Wastewater inlet

Wastewater is continuously brought into the WWTP tank inlet section, which is separated from the plant remaining sections by a partition. At the inlet, coarse impurities are entrapped in the inlet basket, which is a form of wastewater pre-treating. In order to provide for decomposition of the entrapped impurities, wastewater in the tank is pumped within certain periods by the airlift pump to the inlet basket. By this, the coarse impurities are pulverised and easier degradable.

##### Excessive sludge withdrawal

Once the clean water withdrawal is completed, according to the pre-set programme, the excessive sludge withdrawal follows; the sludge is pumped away either into the filtration section or to a separated sludge tank. Sludge water is returned to the purification process. In some cases, the sludge tank may form a part of the wastewater treatment unit. Alternatively, it is possible to withdraw the sludge externally; this applies to cases, when the activated sludge volume exceeds the volume of 700 ml (after the thirty-minute sedimentation test). If so, 1/3 or 2/3 of the sludge tank volume is withdrawn by a sludge removal truck.

##### Sampling

As the airlift discharge is accessible to this purpose, sampling can be done directly in the plant. In cases, where it is required (e.g. for sampling of simple samples), the AS-REVO inspection shaft can be set downstream the unit for checking and sampling (see the separate documentation of the product).

#### 3.3.3 Phosphorus precipitation option

This applies only to the P-marked plants, with additional equipment of phosphorus precipitation. In order to increase the plant efficiency in the sphere of phosphorus removal (i.e. reduction in the  $P_{total}$  indicator) from wastewater pump dosing a precipitating agent into the plant activation section is used. The precipitating agent is stored in a solution storage tank (a jerry can); this tank should be placed at a safe place directly close to the plant.

### 3.3.4 Sanitisation option

This applies only to the H-marked plants. Such plants are fitted with additional equipment for sanitisation on their discharge, i.e. by UV lamps fitted at the discharge stream.

## 4 WWTP tank options

### 4.1 Tank basic option

#### 4.1.1 General

It concerns a compact cylindrical tank made of polypropylene boards, fitted with a ceiling structure and a manhole shaft (chimney). This plant option has no specific marking.

#### 4.1.2 Tank covering – basic option

The tank is partially covered with the ceiling including the manhole shaft (chimney, which is fitted with a removable plastic cover. The cover diameter is 950 mm, which allows loading the cover with uniform weight of max. 200 kg (e.g. disguised structure) or with a single load of max. 100 kg (e.g. a person standing by chance on the cover, or a decorative flower box, etc.).

#### 4.1.3 Tank placement in the ground

##### General

The tank structure is designed so that the tank can withstand (without any further builder's work or structural measures) the earth load after backfilling. The tank is structurally dimensioned for placements into green areas (belts) and loading by backfill earth of the following parameters:

- Specific gravity of 1,900 kg/m<sup>3</sup> (oval-shaped aggregate is recommended, fraction: 1 ÷ 8 mm)
- Angle of internal friction: 35°

The tank must be placed to the reinforced-concrete foundation slab of the planarity of ± 5 mm. The tank bottom may be positioned at the max.  $H_z$  depth – see the Technical Specifications). The ceiling over the tank can be loaded with the maximum layer of 500 mm of backfilling earth.

##### Additional loads

If additional loading is expected in the place of installation (e.g. loading by other backfill type, pressure of passing vehicle wheels, building foundations, stockpile, etc.), or if the tank bottom is placed deeper than  $H_z$  depth (i.e. the plant is installed with an extending adapter and the layer of backfilling earth is > 500 mm), it will be necessary to provide for additional structural reinforcement of the tank, including the adapter (e.g. by concrete pouring, improvements of the earth quality, etc.).



***The additional structural support must be carried out according to a design prepared by professionally competent person.***

### ***Vehicular traffic over the tank***

Any vehicular traffic and loading of the plant by motor road vehicles, within the distance equalling to the plant setting depth in the ground, is forbidden for this type of plant. If such distance is not observed the plant may be damaged.



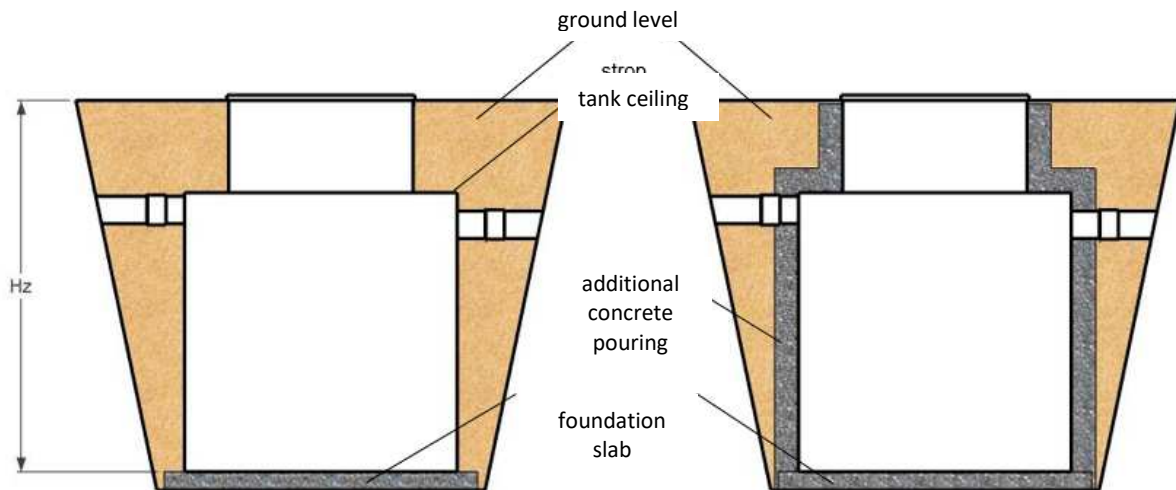
***With regard to potential loading of the cover and the plant neighbourhood by vehicle wheels, no vehicular traffic over the tank (and its neighbourhood) is not allowed.***

### ***Groundwater occurrence***



***If the underground water level is above the level of the foundation slab, it will not be possible to use this tank type.***

### **Plant setting – drawings**



***Basic setting of the tank into the ground***

***Potential setting of the tank into the ground with additional load***

## **4.2 PB, PB-SV tank design**

### **4.2.1 General**

This is a double-jacket framework made of polypropylene serving as sacrifice formwork. From the manufacturer's place, the framework is fitted with fixed reinforcement bars so that it is fully prepared for concrete pouring. On the site, the internal jacket space is poured with concrete and the plastic framework ideally protects the concrete against any effects from both tank sides and provides for perfect water tightness of the tank. The concrete ceiling must be fitted with a damp proof course to prevent earth moisture penetration and/or surface/groundwater inside the internal jacket space.

#### 4.2.2 Closing the tank with the cover

The tank framework is prepared for concreting of the ceiling slab with its manhole, on which standard pre-fab elements of the manhole shaft can be set and the shaft can be consequently closed by a cover corresponding to ČSN EN 124 (Harmonised Czech standard for gully tops and manhole tops for vehicular and pedestrian areas). The cover centre can be loaded with an accidental load from vehicles up to 50 kN.

***In this design version, the plant tank has no manhole shaft or any opening/removable cover.***

#### 4.2.3 Setting the tank into the ground

##### General

The tank structure is designed so that the tank can withstand (without any further builder's work or structural measures) the earth load after backfilling. The tank is structurally dimensioned for placements into green areas (belts) and loading by backfill earth of the following parameters:

- Specific gravity of 2,000 kg/m<sup>3</sup>
- Earth pressure coefficient (at rest)  $K_r = 0.5$

The tank must be placed to the reinforced-concrete foundation slab of the planarity of  $\pm 5$  mm. The tank bottom may be positioned at the max.  $H_z$  depth – see the Technical Specifications). The ceiling over the tank is structurally dimensioned for additional loading with the service rod and vehicle traffic.

For concreting, C 35/45 class concrete is to be used according to ČSN EN 206-1, B500A reinforcing rods dia 12, are used in the internal jacket space according to ČSN EN 10027-1 plus welded wire mesh KZ 05 (dia 8/8-150/150).

##### Additional loads

If additional loading is expected in the place of installation (e.g. loading by other backfill type, pressure of passing vehicle wheels, building foundations, stockpile, etc.), or if the tank bottom is placed deeper than  $H_z$  depth (i.e. the plant is installed with an extending adapter and the layer of backfilling earth is  $> 500$  mm, it will be necessary to provide for additional structural reinforcement of the tank, including the adapter (e.g. by concrete pouring, improvements of the earth quality, etc.).



***The additional structural support must be carried out according to a design prepared by professionally competent person.***

***Measure for further structural reinforcements must be made at the manufacturer's place.***

##### ***Vehicular traffic over the tank***

Vehicular traffic in the site of installation (i.e. loading the cover by vehicle wheels) is possible

### Groundwater occurrence - PB

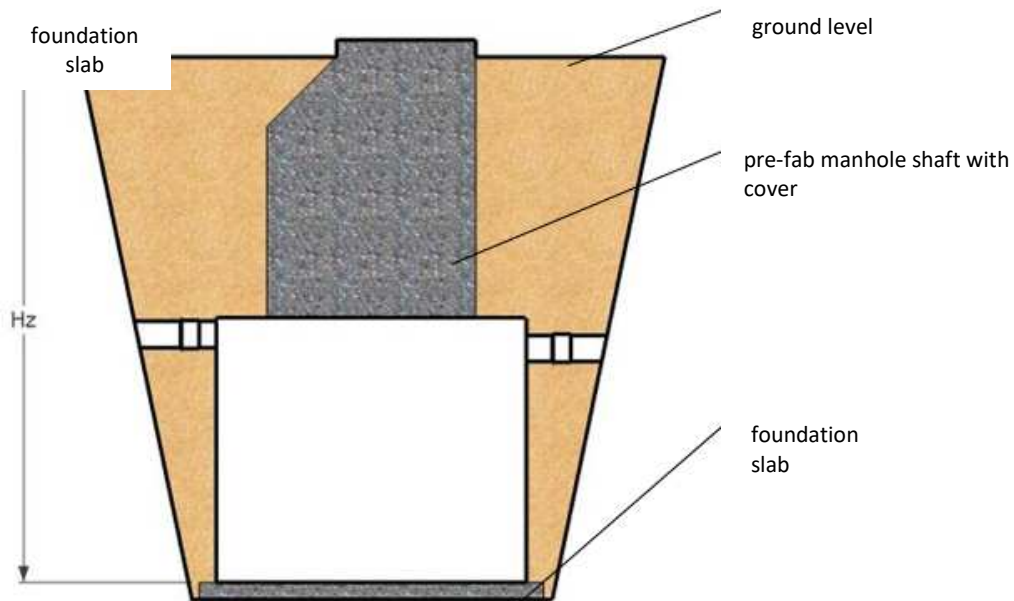


***If the underground water level is above the level of the foundation slab, it will not be possible to use this tank type.***

### Groundwater occurrence – PB-SV

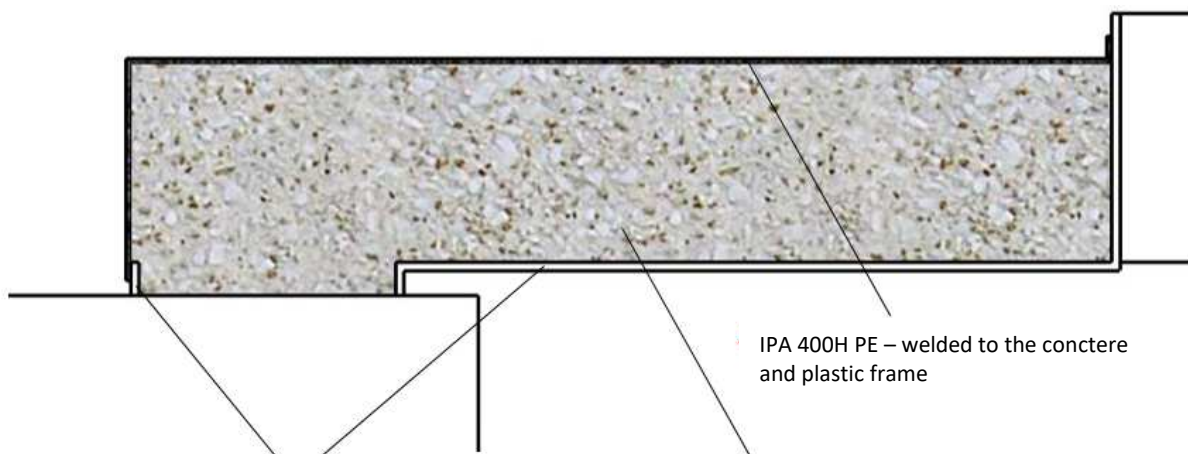
The tank can be used without any additional builder's or structural measures.

### Setting the tank to the ground – drawing



### Setting of the tank into the ground

### Ceiling damp-proof-course



## 5 Process equipment and electrical installations

### 5.1 Process equipment

#### 5.1.1 General

The process equipment and machinery of the plant always consist of:

- control unit,
- blower and blower shaft,
- airlift pumps, and
- aeration element(s)

Depending on the WWTP type (option), the additional process equipment of the plant may also include:

- external box (pillar) containing the blower and the control unit,
- precipitant dosing device, and
- UV lamp

#### 5.1.2 Blower

The blower is the source of pressurized air. It is chosen with regard to the plant nominal size and it is alternatively placed into:

- a plastic container nearby or
- an independent building structure nearby the plant tank (within the max. distance of 12 m).

The blower is connected with the WWTP control unit with a plastic pipe. Concrete specifications of blowers are shown in the relevant technical specifications.

#### 5.1.3 Airlift pump(s)

The pumps are used for pumping of wastewater among individual sections of the plant. They are made of plastic materials. Pressure air brought from the airlift pump is used to drive them. Their operations are controlled by the control unit.

#### 5.1.4 Aerators

Fine-bubble aeration elements provide for the aeration of the activation section in the basic option of WWTP. The aerators are designed to be laid freely on the tank bottom. This design enables easy removal (if necessary for repairs), without the necessity to empty the tank. A pressure air supply & distribution system is a part of the plant.

#### 5.1.5 Precipitant dosing device

The precipitant dosing device is used with the “P” option. ). It is an automatic device usually placed, together with its reservoir of additives, close to control unit. For a detailed description of this device, see the independent documentation supplied with the device.

#### 5.1.6 UV lamp

The UV lamp serves for sanitisation of cleaned water (option H) and it is installed at the discharge. For a detailed description of this device, see the independent documentation supplied with the device.

## 5.2 Electrical installations

### 5.2.1 General

The plant electrical installations include:

- control unit BonBloc Compact,
- blower,
- precipitant dosing device (optional), and
- UV lamp (optional)

### 5.2.2 Power supply to the plant

If the control unit is placed within the building, then it is connected directly to the mains socket outlet by its plug connector. If the control unit is situated outdoor, in the external box (pillar), then it will be necessary to provide for power supply by a suitable cable connected to the socket outlet forming part of the pillar. For detailed specifications of the power supply requirements, see the Technical Specifications.

For detailed specifications of electrical interconnections among individual plant parts, see the Technical Specifications.

## 6 Wastewater brought to the plant

Wastewater is brought from the building, for which the treatment plant is intended within the project design. The plant construction and its technical parameters are dimensioned for the treatment of wastewater corresponding, by its composition and concentration of substances, to the Czech Standard ČSN 75 6402 (Sewage treatment plants up to 500 of population equivalents).

Any changes in the plant utilisation must be consulted with the processing authority of the original design, authorised service centre, or directly with ASIO NEW spol. s r.o.



***It is forbidden to discharge into the house sewerage plumbing of the building, to which the plant is connected, any substances deteriorating or even excluding the life and reproduction of microorganisms, on which the biological plant functions are based.***

***It is therefore strictly discharge namely the following substances:***

- ***pharmaceuticals, poisons and toxic substances,***
- ***paints, diluents and insecticides,***
- ***undiluted acids and alkalis,***
- ***condensates from condensation boilers, and***
- ***other chemicals, such as photographic developers, stabilisers, etc.***





***During the wastewater treatment in the plant, practically the same process takes place as that under the natural conditions (i.e. the self-cleaning process). It therefore makes sense that the plant is “vulnerable” to an inadequate and inconsiderate behaviour, particularly because of using and discharging chemical preparations.***

**The following substances are highly unsuitable in wastewater brought to the plant!**

Liquid or solid substances	Why they are excluded	Where they should be disposed
Ash	Not degradable	Dustbins, trash containers
Tampons, hygienic pads	Plant equipment is clogged	Dustbins, trash containers
Chemicals	Poison the wastewater	Approved waste depots
Disinfectants	Bacteria liquidation	Do not use!
Paints, varnishes	Poison the wastewater	Approved waste depots
Wet towels	Plant equipment is clogged	Dustbins, trash containers
Cleaning towels	Plant equipment is clogged	Dustbins, trash containers
Photographic chemicals	Poison the wastewater	Approved waste depots
Frying fats	Create deposits	Dustbins, trash containers
Sour milk, cream	Create deposits in the reactor and disturb the biochemical process	Dustbins, trash containers
Gypsum and similar materials	Plant equipment is clogged	Dustbins, trash containers
Cat toilet materials	Plant equipment is clogged	Dustbins, trash containers
Cigarette stubs	Create coatings in the tank	Dustbins, trash containers
Contraceptives	Plant equipment is clogged	Dustbins, trash containers
Cork products (stoppers, etc.)	Create coatings in the tank	Dustbins, trash containers
Varnishes	Poison the wastewater	Approved waste depots
Pharmaceuticals and similar preparations	Poison the wastewater	Approved waste depots
Engine oils	Poison the wastewater	Approved waste depots
Oil contaminated waste	Poison the wastewater	Approved waste depots
Earplugs	Plant equipment is clogged	Dustbins, trash containers
Pesticides	Poison the wastewater	Approved waste depots
Brush cleaning diluents	Poison the wastewater	Approved waste depots
Cleaning preparations in general	Poison the wastewater	Approved waste depots
Razor blades	Plant equipment is clogged, danger of injury	Dustbins, trash containers
Preparations for cleaning waste pipes and drains	Poison the wastewater	Do not use!
Insecticides	Poison the wastewater	Approved waste depots
Kitchen oils and similar	Plant equipment is clogged	Dustbins, trash containers
Leftovers – do not use kitchen rubbish crushers	Plant equipment is clogged	Dustbins, trash containers
Wallpaper glues	Plant equipment is clogged	Approved waste depots
Textiles, e.g. pantyhose, various rags and handkerchiefs	Plant equipment is clogged	Approved waste depots for used textile
Diluents	Poison the wastewater	Approved waste depots

Toilet cleaning preparations	Poison the wastewater	Approved waste depots
Diapers	Plant equipment is clogged	Dustbins, trash containers

***BEWARE of disinfectants!***

***Disinfectants of sanitary hygiene must be used cautiously. They liquidate not only viruses and microbes, but also microorganisms providing for cleaning effects in the plant.***

***BEWARE of inadequately frequent laundry washing!***

***The quality of the plant cleaning process is negatively influenced with excessive concentrations of detergents and tensides in surge laundry washing (i.e. several laundry machines operating within a short time interval).***

***BEWARE of oils and fats!***

***Apart from chemical agents, they are in large quantities also dangerous to correct operations of the plant. By their decomposition, they make wastewater strongly acidic, which results in an adverse environment for the plant biological conditions. In case of wastewater brought from kitchens, a grease trap must be installed upstream the plant.***



***BEWARE of swimming pool water!***

***Discharging of large quantities of swimming pool water (even clean) or accumulated rainwater through the plant will cause flushing the microorganisms out of the plant into the discharge, which stops the plant operation. In case of swimming pool water, also the relevant chemicals in it have negative effects (i.e. chlorinated and stabilising preparations).***

***BEWARE of kitchen waste disposers!***

***Waste disposer connected to the kitchen discharge load inadequately the plant by large quantities of insoluble substances as well as large water volumes.***

***BEWARE of kitchen water treatment units!***

***Some water treatment units may (in the regeneration phase) discharge larger quantities of contaminated water that may by its composition and hydraulic conditions serious disturb the plant functionality.***

The wastewater treatment plants are dimensioned to certain daily volumes of wastewater. If such volumes are exceeded, or the daily inlet concertation takes place in a short period of time, the plant functions may be disabled partially or fully.

***It is forbidden:***

- ***to discharge large volumes of wastewater exceeding the design parameters of the plant,***
- ***surge discharging of wastewater exceeding 20% of the total daily inlet during one hour\****

\* If this cannot be avoided (e.g. plant utilisations for other purposes than in family houses (i.e. surge discharges in some facilities, it will be necessary to consider such conditions in the designing phase and, as appropriate, divide the wastewater streams or place an accumulation tank upstream and provide for a uniform inlet to the wastewater treatment plant.

## 7 General design instructions

### 7.1 General

A correctly designed project is an essential prerequisite for successful plant operations. In the design process, we advise to proceed in the following way:

- Select an adequate type of WWTP
- Choose the total WWTP layout
- Consider the details concerning the connection of inlet/discharge pipes
- Consider the details concerning the WWTP ventilation
- Consider the details concerning the WWTP setting and interconnecting of other WWTP sections

### 7.2 Selecting the WWTP type

#### 7.2.1 General

In the selection process, we advise to proceed in the following way:

- Select an adequate size of WWTP
- Select an adequate option of WWTP in terms of discharge parameters
- Select an adequate design of tank and its setting into the ground

#### 7.2.2 Determination of the PE number and nominal loading

For the number of connected PE units, it is possible to use the coefficients resulting out of ON 1085, ATV A 129; they are shown in the table below:

Subject	Unit	Conversion coefficient to PE
Family house *	person	1
Lodging house / simple boarding school	bed	1
Lodging house, medium standard (e.g. with laundry)	bed	2
Camping	visitor	0.5
Pub, no food served	seat place at table	0.33
Pub only cold food served	seat place at table	0.5
Pub with a triple use of the seat place at the table	seat place at table	1
Pub terrace	seat place at table	0.1
Theatre, cinema	seat place	0.066
Sports facilities - visitors	visitor	0.02
Sports facilities - sportsmen	sportsman	0.2
Outdoor bath, swimming pool	visitor	0.2
School	pupil	0.33
Kindergarten	pupil	0.2
Business company – manufacturing employees	employee	0.5
Business company – offices	employee	0.3
Camping (standing for caravan = 70m <sup>2</sup> )	standing	1
Harbour	anchor place	2
* A house with dwelling areas up to 40 m <sup>2</sup> corresponds to two persons, above 40 m <sup>2</sup> it corresponds at least to four persons		

In these calculations, we recommend considering in addition:

- BOD<sub>5</sub> loading of 60 g/PE/day

- Hydraulic loading: 150 litres /PE/day

**Number of connected PE units = number of units × conversion coefficient to PE**

BOD<sub>5</sub> loading (with substances) = 60 g per PE per day

Hydraulic loading = 150 litres per PE per day

***In justified cases, make the calculation of loading with substances in another way.***

***The design size of the plant must correspond to the design parameters of hydraulic loading (= max. assumed flow rate) and BOD<sub>5</sub> loading (= max. assumed incoming pollution).***

### Selection of the nominal size according to the PE units

If the calculation is carried out in the standard way, select the suitable WWTP size according to the number of connected PE units according to the below table:

WWTP size	4	8	12	16	20	30	40	50
Min. number of PE	2	5	6	8	10	15	20	25
Max. number of PE	5	9	13	18	23	34	44	55

***If the assumed number of PE units is nearing to the minimum or maximum values, consider a possibility of using the neighbouring nominal size, e.g. as regards to a facility enhancement in the future. If in doubts, consult the selection with ASIO NEW, spol. s r.o.***

If the calculation is carried out in a non-standard standard way for other loading with pollutants or hydraulic loading or if you know the actual wastewater parameters, select a suitable nominal size of WWTP according to those loading parameters so that not a single value in the selected size is exceeded.

WWTP size	4	8	12	16	20	30	40	50
Nominal flow rate (m <sup>3</sup> /day)	0.6	1.20	1.8	2.4	3	4.5	6	7.5
Nominal loading (kg BOD <sub>5</sub> /day)	0.24	0.48	0.72	0.96	1.20	1.8	2.4	3

***In this case, we recommend consulting the selection of nominal sizes with ASIO NEW, spol. s r.o.***

### 7.2.3 Selection in terms of the discharge parameters

In case of standard requirements for the cleaned water quality, it is possible to select the basic option, or if required, the Option “P” for the phosphorus content reduction. The guaranteed water quality values are showed in the table below.

OPTION	Guaranteed concentration values in the cleaned water at the discharge*					
	BOD <sub>5</sub> (mg/l) (p/m)	COD (mg/l) (p/m)	Insolubles (mg/l) (p/m)	N-NH <sub>4</sub> <sup>+</sup> (mg/l) (p/m)	N <sub>total</sub> (mg/l) (p/m)	P <sub>total</sub> (mg/l) (p/m)
Basic AS-MONOcomp ...	20 / 30	90 / 130	20 / 30	10 / 20	18 / 20	6 / 8
AS-MONOcomp "P"... with the dosing device	20 / 30	90 / 130	20 / 30	10 / 20	18 / 20	1 / 2

\* Values are according to NV 401/2015 Coll., p = permissible values, m = maximum values. The "P" values are decisive if evaluated according to NV 57/2016 Coll.

## 7.2.4 Tank design

The tank design must be selected with regard to the tank expected setting into the ground, in terms of:

- setting the tank bottom depth,
- loading of the ground in the tank placement area, and
- occurrence of underground water.

A detailed description of settings of individual tank options is shown in the Chapter **WWTP Tank Options**. A brief overview of setting possibilities is shown in the table below.

A brief list of individual setting options:

Tank design	Basic	/PB	/PB-SV
Setting to a green area	YES	YES	YES
Setting to premises with additional loading	s	YES	YES
Setting to depths higher than the maximum depth (Hz)	s	YES*	YES*
Setting to areas with vehicular traffic	NO	YES	YES
Setting to areas with the underground water level above the foundation slab level	NO	NO	YES

*s... additional builder's work in connection will be necessary (e.g. concrete encasement, etc.),*

*\*... under the conditions stipulated in Chapter WWTP Tank Options.*

## 7.3 Layout of the plant

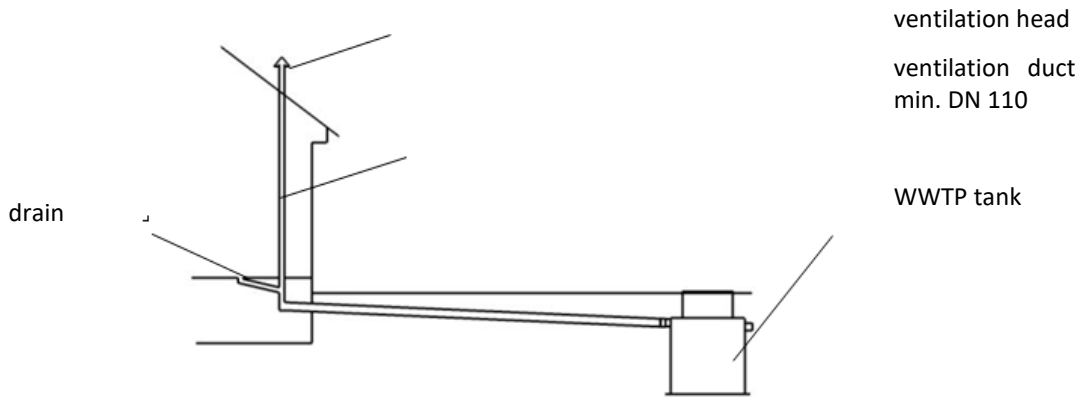
The WWTP overall selection will include the placements of tank, blower, and distributors, as applicable. Potential options are described in Chapter **Technical Specifications**.

## 7.4 Connecting inlet and discharge pipes

As a standard, the inlet and discharge pipes are made of polypropylene pipes compatible with sewer socket pipes made of polyvinyl chloride (PVC) with rubber rings. If other sewer pipes are used (e.g. earthenware), then the transition must be made by the use of a relevant PVC pipe adapter.

## 7.5 Ventilation of the plant

The ventilation must be carried out through the inlet pipe in accordance with the Czech Standard ČSN EN 12 056 and led out above the top floor level.



***Please note that neither aeration valve placed on the vertical sewer branch (riser) nor suction hose can satisfactorily provide for the plant ventilation!***

## 7.6 Electrical design documentation

During the project design works, it will be necessary to consider:

- power supply cable to the control unit, and
- interconnections of plant individual sections with cables.

Detailed information for the project design is described in Chapter **Technical Specifications**.

## 8 General installation instructions

### 8.1 Professional qualifications

The plant installation works may be carried only by professionally competent persons duly qualified for:

- construction (building) works, and
- electrical installations.

### 8.2 Installation supporting documents

The installation must be conducted in accordance with the below-given instructions. The building part of the project must correspond to a project prepared by a duly competent person.



***If any of installation procedures seems unclear to you or if you think that you do not have the necessary skills or means, then do not do the installation and turn to ASIO NEW, spol. s r.o. or its authorised representative.***

### 8.3 Scope of the plant supply

Depending on the size and option, the WWTP supply involves:

- WWTP full-rigged tank (always),
- blower (always),
- control unit (always),
- plastic containers for blowers - pillar (as necessary),
- phosphorus precipitation device (as necessary), and
- UV lamp (as necessary).



***Before the commencement of the installation, please check for the delivery completeness according to the bill of delivery. If the supply is not complete, then turn to ASIO NEW, spol. s r.o. or its authorised representative.***

### 8.4 Installation steps in general

In the installation, the below specified steps should be followed:

- construct the foundation slab,
- carry out necessary excavations for connections among individual WWTP sections,
- in case of underground water occurrence, lower its level under the foundation slab level,
- place the tank on the foundation slab,
- connect the inlet and discharge pipes into the sewer system,
- install the blower container (as needed),
- install the blower in the building or to the container,
- carry out all the necessary interconnections among individual WWTP sections,
- carry out backfilling or concrete pouring of the tank
- lay all protective sleeves for cables among the electrical panel and WWTP electrical devices, including pull-through of cables,
- check the tank tightness and carry out final backfilling of excavated places with earth, and
- once the installation is completed, invite ASIO NEW, spol. s r.o. or its authorised representative for the plant commissioning procedure.



***If you find, before the placement of the WWTP tank into the pit or during the installation, any damage in the tank, please turn to ASIO NEW, spol. s r.o. or its authorised representative immediately, because any repair of the tank must be made outside the pit.***

***Do not leave the installed and backfilled tank in the ground empty (i.e. without filling it with water)!***

## 9 Foundation slab construction

### 9.1 General

The foundation slab construction includes:

- foundation pit excavation, and
- preparation of the foundation slab.

### 9.2 Foundation pit excavation

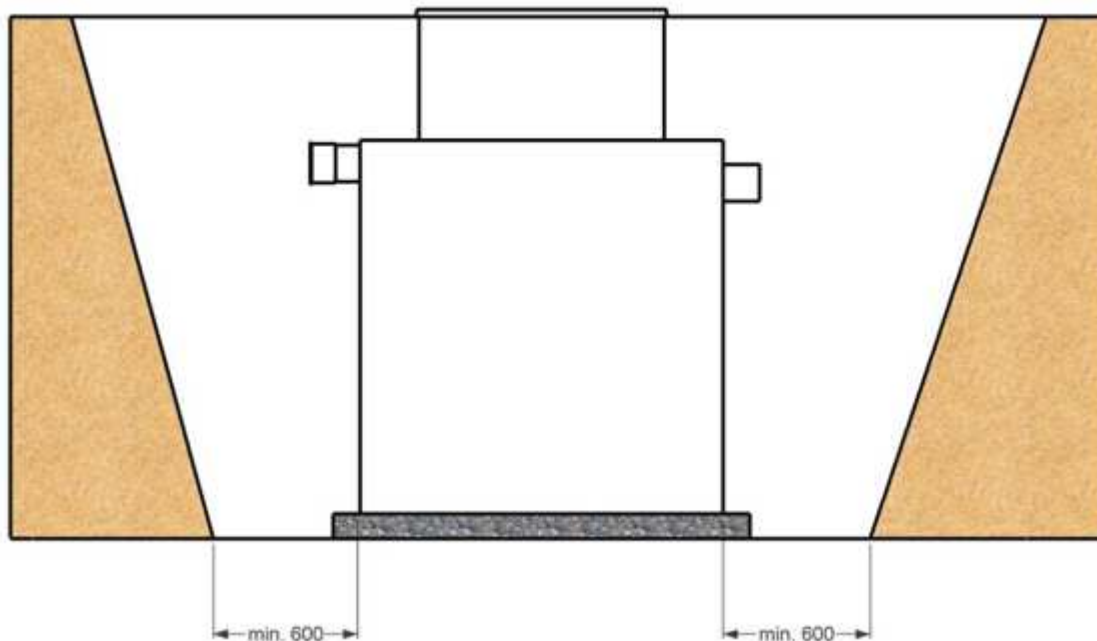
The pit plan area must overlap at every side the tank dimension by at least 600 mm (in all directions).

### 9.3 Preparation of the foundation slab

The slab thickness must correspond to the load bearing capacity of bearing ground. Resilient resistance against shifting  $w_p$  (in mm) in the centreline must be at least  $C_{1z} = 10 \text{ MN/m}^3$ . The foundation slab planarity must be  $\pm 5 \text{ mm}$ .



***Once the foundation slab is completed, verify the slab planarity and record the measurement results!***





## 10 Setting of the WWTP tank

### 10.1 General

The tank setting consists of its placement to the foundation slab, concrete pouring around it and backfilling with earth. Possible methods and steps are different for individual tank designs.



***Before you start the work, make sure that the intended method of setting is compliant with the relevant tank design.***

***Be careful to avoid any damage of connected pipes to the tank by backfilling and/or concreting procedures!***

### 10.2 Tank – basic option

#### 10.2.1 General

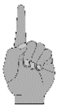
The tank setting can be carried out by:

- Backfilling with earth
- Additional concrete pouring (as needed).

#### 10.2.2 Setting with backfilling

During the backfilling step, observe the following procedure:

- Proceed from the bottom by separate layers
- Each layer approx. 0.3m thick should be compacted before the next layer is laid
- Together with backfilling, step-by-step fill the tank so that the water level correspond to the backfilled earth layer



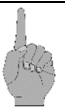
***Make sure that the backfill earth does not contain any stones, builder's debris, or any other particles that could mechanically damage the tank.***

***If not filled with water simultaneously, the tank may collapse.***

#### 10.2.3 Setting with additional concrete pouring

During the concrete pouring step, observe the following procedure:

- Proceed from the bottom by separate layers
- Each concrete layer approx. 0.3m thick should be compacted before the next layer is laid
- Together with concreting, step-by-step fill the tank so that the water level correspond to the backfilled earth layer



***If not filled with water simultaneously, the tank may collapse.***

## 10.3 Tank design /PB

### 10.3.1 General

The tank setting should be carried out by with:

- Standard concrete pouring into the internal jacket space
- Additional concrete pouring (as needed).

### 10.3.2 Standard concrete pouring into the internal jacket space

The following steps should be observed during the concrete pouring:

- Concrete should be poured by a hose (concrete pump) or a sleeve (gravity pouring of concrete mixture); the hose is to be inserted into the internal space of the frame walls so that in depths exceeding 1.5 m the concrete mixture is not separated
- After the tank bottom is poured with concrete, wait for concrete setting (SV option only)
- Fill the tank with water. The internal space layer is poured to the height of max. 0.5 m (uniformly around the whole tank frame)
- Continue with concreting the internal space of the frame always up to the layer thickness of max. 0.5 m. Before each concreting wait for concrete setting in the previous layer. Fill the tank with water, uniformly in all sections, up to the height of approx. 700 mm above the topmost concrete layer
- In this way, pour concrete in the internal jacket up to the ceiling.
- The last layer is laid on the ceiling. Again, this layer may be poured only after concrete setting in the internal jacket



***It will be always necessary to fill the tank with water up before concreting the next layer.***



***Always use the concrete class stipulated in the design documentation (standard: C 35/45 class concrete according to ČSN EN 206, slump test S5 >200 mm according to ČSN EN 12350, density: 2,400 kg/m<sup>3</sup>).***

### 10.3.3 Setting with additional concrete pouring

The tank should be concreted as follows:

- Standard concrete pouring into the internal jacket space
- Additional concrete pouring of the tank as required by the design documentation.

## 11 Setting and connecting of other sections of the plant

### 11.1 General

Depending on setting and connections, the installation works involve:

- Installation of the control unit and the blower
- Installation of the dosing pump

### 11.2 Installation of the control unit and the blower

#### 11.2.1 Placement in the building

Hang the control unit in a normal way on the wall and connect the blower by a hose.

#### 11.2.2 Optional accessories – the pillar

Place the pillar into an excavated pit and backfill it. Hang the control unit on the pillar wall above the blower and connect the blower with the control unit.



***While placing the blower, make sure that there is a sufficient air supply into the building (the air is withdrawn from the building into the WWTP tank).***

***The blower must be placed at the maximum distance of 12 meters from the WWTP tank.***

### 11.3 Installation of the dosing pump

#### 11.3.1 Placement in the building

Hang the dosing pump in a suitable way on the wall nearby the control unit. The jerry can (additive reservoir) with the dosed liquid should be placed within the pump range.

#### 11.3.2 Optional accessories – the pillar

The dosing pump is a part of the supplied pillar. Place the pillar as described above.



***If it is required by local/national regulations, the initial official inspection must be conducted for the whole WWTP placements and cabling before it commissioning.***

#### 11.4.1 Control unit installation

(1) Connect the blower with the control unit using a rigid hose – ¾" size.

(2) Interconnect the control unit outputs with individual components in the plant. In four cases, use a ¾" rigid hose. The hose leading to the plant must be laid in a protective sleeve (min. DN 90) preventing it against damage.



***The routes and the hoses must be laid as linear as possible; no breaks are allowed, as it could result in their clogging.***

### 11.4.2 Connecting the dosing pump

- (1) Connect the dosing pump on the suction side with the jerry can (additive reservoir).
- (2) Together with air hoses, pull the hose on the discharge side through the protective sleeve into the plant.

## 12 Commissioning of the plant

### 12.1 Putting into service by the technician

The commissioning of the plant is carried out by ASIO NEW, spol. s r.o. or its authorised representative. This includes:

- Correct installation inspection of the plant
- Adjustment and tuning of individual part of the plant
- Training of future personnel

The commissioning procedures and personnel training will be recorded in the “Handover and Installation Certificate”. At the commissioning, the plant is handed over to its owner/operator.



***Before the commissioning procedure is completed, it is not allowed to operate the plant!***

***The commissioning must be documented in the Handover and Installation Certificate!***

### 12.2 Technical documentation

Within the commissioning procedure, the user will receive the following technical documents:

- User Manual
- Brief Operating Instructions
- Test certificate for the plant water tightness
- Blower instruction manual

### 12.3 Commissioning conditions

For successful commissioning of the plant, the following conditions must be met:

- The plant must be correctly installed and set
- Power supply must be brought into the plant
- Qualified operator(s) must be present for training
- A person authorised for accepting the technical documentation must be present (if such person is different from the operators).

## 13 Handling, transport and storage

### 13.1 Handling

Handling of the tank can be carried out with the use of a forklift truck or a crane.



***While handling the plastic tank, proceed with special care due to the reduced impact resistance of plastic materials.***

***At temperatures below 5 °C, any handling of the tanks is forbidden, because of danger of its damage due to embrittlement of plastic materials.***

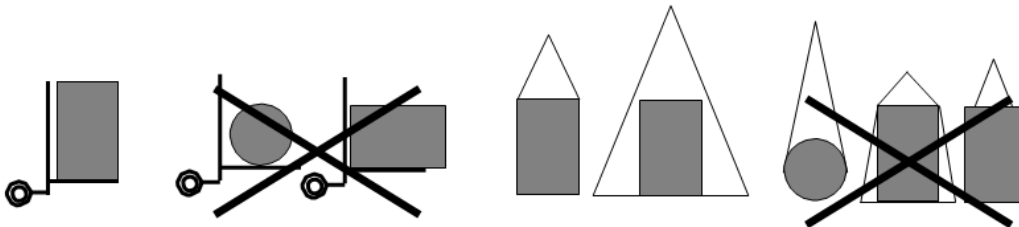
Before any handling, it will be necessary to check its general condition first, with a special attention paid to its fastening and tying elements. In addition, it will be necessary to make sure that inside the tank there are no foreign things or liquids (such as rainwater).



***Rainwater must be pumped away from the tank before the handling!***

During the handling, observe the following principles.

- Select an adequate method of handling with regard to the tank height, shape and dimensions
- While laying or hanging the tank, follow the rules shown in the pictures below
- For hanging the tank, use only the fastening elements provided with the tank!



***While handling the tank, all generally applicable codes, and standards concerning occupational and health safety must be followed.***

### 13.2 Transport

The transport means must be chosen with regard to the tank height, shape, and dimensions.



***The tank should be placed at its bottom and fixed against movements. Do not transport any foreign things inside the tank!***

### 14.3 Storage

If the tank is to be stored before its installation, it will be necessary to place it on a flat and hard surface and provide for other conditions preventing any mechanical damage and/or falling of persons inside the tank.



***If the tank is to be kept in storage for two months or more, make sure that it is protected (by a sun screen) against solar radiation. The plastic materials of the tank do not contain stabilisers protecting against UV radiation.***

## 15 Attendance and maintenance

### 14.1 General

The plant is designed in a manner that does not require a permanent attendance. However, after its starting-up, it will be necessary to perform regular inspections as well as the below described activities (see the table).

Activities necessary for correct operations of the plant						
Activity interval					Activity name	Approx. time demand
Daily	Weekly	Monthly	Biannually	Other interval		
x					Checking the function of the SBR blower (without opening the WWTP tank)	approx. 1 minute
	x				Visual inspection of the plant	approx. 5 minutes
		x			Cleaning of the blower air filter	approx. 5 minutes.
		x			Checking of activated sludge	approx. 10 minutes
		x			Dewatering of aerators	Approx. 10 minutes.
			x		Checking of dewatering basket	approx. 60 minutes.
				as needed	Activated section de-sludging	approx. 10 minutes.
				as needed	Sampling	approx. 10 minutes.

The overall time demand for the operators is approximately 16 hours a year. For detailed instructions for the attendance and maintenance, see the User Manual (handed over to the operator during the plant commissioning).

### 14.2 Operators' qualifications

The attendance and maintenance of the plant may be performed by persons without any special qualifications. The future operators are trained within the WWTP commissioning procedures.

## 15 AS-MONOcomp technical specifications

### 15.1 Sizes, options and type markings

This plant is manufactured in several sizes and types differing by their construction materials used and tank design. The type marking is as follows:

**AS-MONOcomp ...**  
7

Marking specifying the number of connected inhabitants (indicative only)

### 15.2 Scope of the supply

WWTP with full rigged tank	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> as ordered
Manhole cover	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> as ordered
Blower	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> as ordered
Control unit	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> as ordered
Phosphorus precipitation dosing device	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> as ordered
Sanitation	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> as ordered

### 15.3 Technical data

#### 15.3.1 K design parameters

WWTP size	PE number	Nominal daily flow rate (m <sup>3</sup> /day)	Nominal BOD loading (kg BOD <sub>5</sub> /day)
4	2-5	0.6	0.24
8	5-9	1.2	0.48
12	6-13	1.8	0.72
16	8-18	2.4	0.96
20	10-23	3.00	1.20
30	15-34	4.5	1.8
40	20-44	6	2.4
50	25-55	7.5	3

#### 15.3.2 Guaranteed discharge parameters

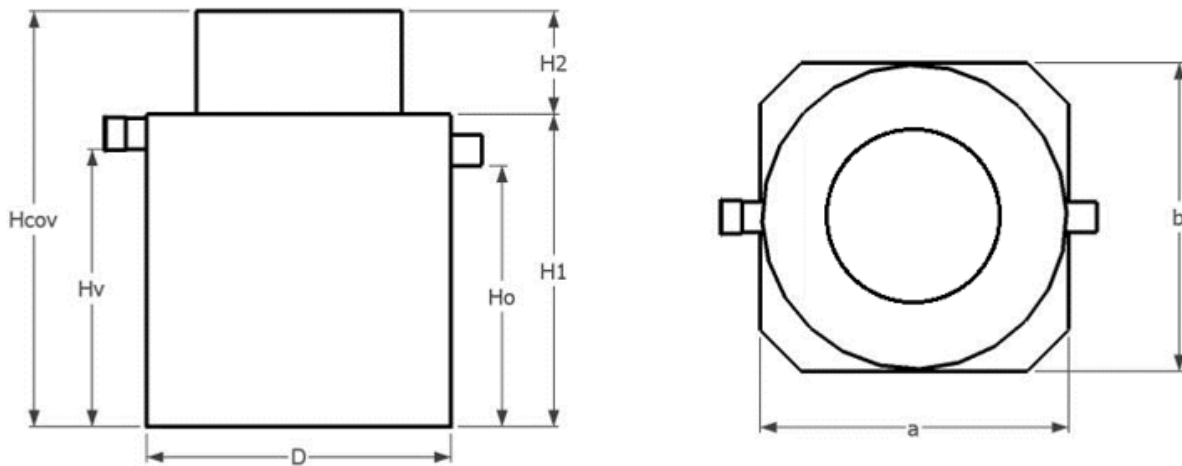
OPTION	Guaranteed concentration values in the cleaned water at the discharge*					
	BOD <sub>5</sub> (mg/l) (p/m)	COD (mg/l) (p/m)	Insolubles (mg/l) (p/m)	N-NH <sub>4</sub> <sup>+</sup> (mg/l) (p/m)	N <sub>total</sub> (mg/l) (p/m)	P <sub>total</sub> (mg/l) (p/m)
Basic AS-MONOcomp ...	20 / 30	90 / 130	20 / 30	10 / 20	18 / 20	6 / 8
AS-MONOcomp "P" ... with the dosing device	20 / 30	90 / 130	20 / 30	10 / 20	18 / 20	1 / 2

\* Values are according to NV 401/2015 Coll., p = permissible values, m = maximum values. The "P" values are decisive if evaluated according to NV 57/2016 Coll.

### 15.3.3 Dimensions and weights

WWTP size	D (mm)	Hv (mm)	Ho (mm)	H1 (mm)	H2 (mm)*	Hcov (mm)	H <sub>z</sub> (mm)	DN inlet/discharge	a (mm)	b (mm)	Weight (kg)
4	1200	1300	1220	1520	500	2020	2020	150	1250	1250	180
8	1700	1300	1220	1520	500	2020	2020	150	1750	1750	340
12	2100	1300	1220	1520	500	2020	2020	150	2150	2150	450
16	1900	2100	2020	2320	500	2820	2820	150	1950	1950	680
20	2100	2100	2020	2320	500	2820	2820	150	2150	2150	750
30	2400	2100	2020	2320	500	2820	2820	150	2450	2450	830
40	2300	2730	2650	2970	500	3470	3470	150	2350	2350	900
50	2500	2730	2650	2970	500	3470	3470	150	2550	2550	950

H2 ... basic height with the chimney, without the adapter  
H<sub>z</sub> (mm) ... max. depth of foundation bottom – if exceeded, structural support will be necessary (e.g. by concreting).



### 15.3.4 Setting the tank into the ground – procedure

Tank construction and design	Green belt*	Space with additional loading	Tank bottom is higher than max. depth H <sub>z</sub>	Area with vehicles traffic	Ground water level above the foundation slab level
„No marking”	YES	s	s	NO	NO

\* ... Backfill density 1900 kg/m<sup>3</sup>, internal friction angle 35°, tank bottom depth: max. H<sub>z</sub>

s. ... Additional builder's work in connection necessary (e.g. concreting)



### 15.3.5 Blower

WWTP size	Type*	Absorbed power at 20 kPa	Noise emissions (dB)	Air quantity supplied (l/min)	Voltage system for connection	Placement class	Temperature range at the placement (°C)
4	Airmac DBMX-	100	48	100	TN-S 1+N+PE 230V/50Hz	AA 4, AB 4, AC 1, AD 4, AE 4, AF 2	5 - 40
8	2x Airmac DBMX-	2x100	2x48	2x100			
12	Airmac DBMX-	298	56	244			
16	Airmac DBMX-	298	56	244			
20	2x Airmac DBMX-	2x186	2x48	2x163			
30	Airmac DBMX-	460	52	407			
40	LUTOS DT4R	400	66/79**	433			
50	LUTOS DT4R	500	67/81**	516			

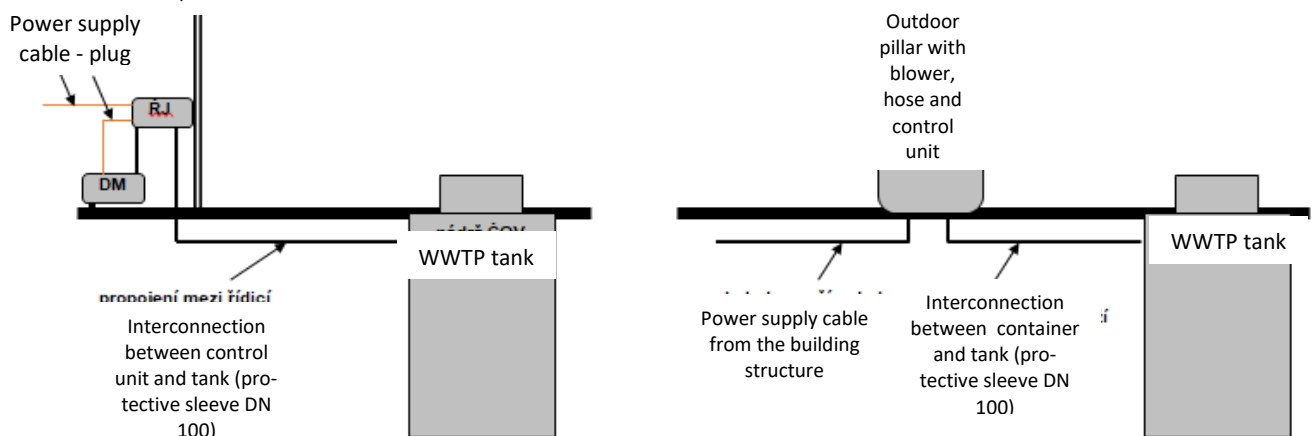
\* ... Individual types may be changed according to current offers from the suppliers.  
\*\* ... Noise level with / without cover

### 15.3.6 Aerators

WWTP size	Type	Number
4	Pipe-shaped fine-bubble element	1
8		2
12		3
16		3
20		3
30		4
40		5
50		6

## 15.4 Possible WWTP layouts

Building structure  
(garage, shed, etc.)



## 15.5 Necessary construction and installation works (not included in the supply)

### 15.5.1 General scope of construction and installation works

Setting of the tank into the ground	<input checked="" type="checkbox"/> YES
Sewer connections	<input checked="" type="checkbox"/> YES
Setting of the container into the ground	<input checked="" type="checkbox"/> YES (if the pillar is used)
Interconnection between blower and control unit	<input checked="" type="checkbox"/> YES
Interconnection between tank and control unit	<input checked="" type="checkbox"/> YES (four hoses in the protective sleeve)
Power supply to the plant	<input checked="" type="checkbox"/> YES

### 15.5.2 Power supply in case the control unit is placed in a building structure

Independently protected receptacle: 230V/50Hz, TN-C-S 1+N+PE.

### 15.5.3 Power supply in case the pillar is used

Independently protected incoming cable CYKY 3x1.5; 230V/50Hz, TN-C-S 1+N+PE connected into a waterproof mains receptacle installed in a container.

### 15.5.4 Interconnection between the blower and the control unit

Reinforced hose for air distribution (dia:  $\frac{3}{4}$ " , internal dia: 19 mm).

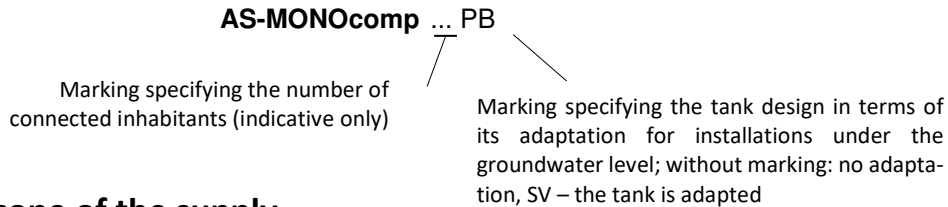
### 15.5.5 Interconnection between the tank and the control unit

Four pieces of reinforced hose for air distribution (dia:  $\frac{3}{4}$ " , internal dia: 19 mm).

## 16 AS-MONOcomp technical specifications

### 16.1 Sizes, options and type markings

This plant is manufactured in several sizes and types differing by their construction materials used and tank design. The type marking is as follows:



### 16.2 Scope of the supply

WWTP with full rigged tank

YES  NO  as ordered

Blower

YES  NO  as ordered

Control unit

YES  NO  as ordered

Phosphorus precipitation dosing device

YES  NO  as ordered

Sanitation

YES  NO  as ordered

Shaft adapter with cover (concrete, pre-fab elements)

YES  NO  as ordered

#### 16.3.1 Guaranteed discharge parameters

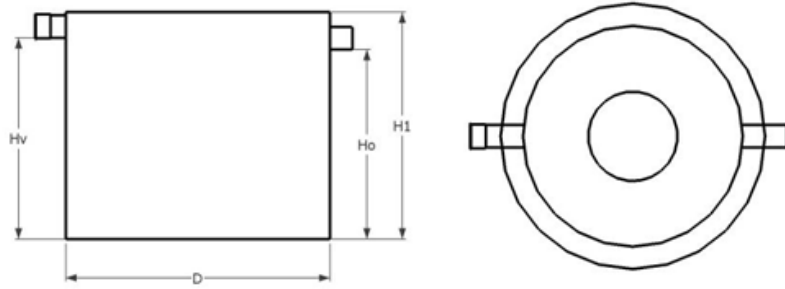
OPTION	Guaranteed concentration values in the cleaned water at the discharge (mg/l)					
	BOD <sub>5</sub> (mg/l) (p/m)	COD (mg/l) (p/m)	Insolubles (mg/l) (p/m)	N-NH <sub>4</sub> <sup>+</sup> (mg/l) (p/m)	N <sub>total</sub> (mg/l) (p/m)	P <sub>total</sub> (mg/l) (p/m)
Basic AS-MONOcomp ...	20 / 30	90 / 130	20 / 30	10 / 20	18 / 20	6 / 8
AS-MONOcomp "P"... with the dosing device	20 / 30	90 / 130	20 / 30	10 / 20	18 / 20	1 / 2

\* Values are according to NV 401/2015 Coll., p = permissible values, m = maximum values. The "m" values are decisive if evaluated according to NV 57/2016 Coll.

#### 16.3.2 Dimensions and weights K/PB

WWTP size	D (mm)	Hv (mm)	Ho (mm)	H1 (mm)	H2 (mm)	DN inlet/discharge	Weight (kg)	Concrete volume in m3 (informative value only)*
4	1520	1300	1220	1670	5000	150	345	1.11
8	2020	1300	1220	1670	5000	150	465	1.69
12	2420	1300	1220	1670	5000	150	585	2.18
16	2220	2100	2020	2470	5000	150	765	2.7
20	2420	2100	2020	2470	5000	150	1100	3.04
30	2720	2100	2020	2470	5000	150	1350	3.43
40	2620	2730	2650	3120	5000	150	1680	4.01
50	2820	2730	2650	3120	5000	150	1900	4.42

H<sub>z</sub> (mm) ...max. depth of the foundation pit  
\* Concrete is not a part of the supply



### 16.3.3 Dimensions and weights K/PB-SV

WWTP size	D (mm)	Hv (mm)	Ho (mm)	H1 (mm)	H2 (mm)	DN inlet/discharge	Weight (kg)	Concrete volume in m <sup>3</sup> (informative value only)*
4	1520	1450	1370	1830	5000	150	385	1.38
8	2020	1450	1370	1830	5000	150	535	2.16
12	2420	1450	1370	1830	5000	150	760	2.86
16	2220	2250	2170	2630	5000	150	1000	3.27
20	2420	2250	2170	2630	5000	150	1400	3.72
30	2720	2250	2170	2630	5000	150	1840	4.29
40	2620	2900	2820	3280	5000	150	2250	4.8
50	2820	2900	2820	3280	5000	150	2650	5.34

H<sub>z</sub> (mm) ...max. depth of the foundation pit  
\* Concrete is not a part of the supply

### 16.3.4 Setting the tank into the ground – procedure

Tank construction and design	Green belt*	Space with additional loading	Tank bottom is higher than max. depth H <sub>z</sub>	Area with vehicles traffic	Ground water level above the foundation slab level
K/PB	YES	YES	YES**	YES	NO
K/PB-SV	YES	YES	YES**	YES	YES

\* ... Backfill density 1900 kg/m<sup>3</sup>, internal friction angle 35°, tank bottom depth: max. H<sub>z</sub>  
\*\* ... Under the conditions stipulated in **WWTP Options**

### 16.3.5 Other technical specifications

For other technical specifications are identical with those shown in Chapter 15.

## 17 Optional accessories

### 17.1 Additional phosphorus precipitation device

Type*	Absorbed power (kW)	Current (A)	Voltage (V)	Flow rate (litres per hour)
NKNSOO1HA110	0.015	0.6	230	1
*... Individual types may be changed according to current offers from the suppliers.				

Recommended pump lift and discharge heights are up to five (5) metres.

Designed consumption of chemicals: 1.35 litres per PE unit per month.

Precipitant used: Iron(III) sulphate  $Fe_2(SO_4)_3$  (commercial name: Prefloc)

Connection by a transparent hose PVC 4/6 mm.

### 17.2 UV lamp

For the sanitation purposes, UV lamp can be optionally installed at the discharge.

Type*	Absorbed power (W)	Voltage (V)	Service life (hours)
UVC immersion lamp (60W)	60	230	max. 8000
* ... Individual types may be changed according to current offers from the suppliers.			

## 18 Declaration of Conformity (CE)

### *AS-MONOcomp – Standard version*

## CE

ASIO NEW, spol. s r.o.  
Kšírova 552/45  
619 00 Brno, CZ

**EN 12566-3+A2**

Small wastewater treatment systems for up to 50 PE

## AS-MONOcomp

SBR-Process in a single tank with external sludge reservoir

Test performed by:  
TUV SUD Czech s. r. o.  
Notified Organisational Unit No. 1017  
Novodvorská 994  
140 00 Prague 4

Cleaning efficiency (at daily organic loading of BOD<sub>5</sub> = 0.24 kg per day)

COD	96.1%	(27.7 mg/L)
BOD <sub>5</sub>	99.1%	(2.7 mg/L)
Insolubles	98.1%	(6.5 mg/L)
NH <sub>4</sub> -N	93.2%	(4.0 mg/L)
N <sub>TOTAL</sub>	85.1%	(11.6 mg/L)
P <sub>TOTAL</sub>	71.3%	(2.7 mg/L)

Cleaning capacity

Nominal organic loading\*

0.24 0.48 0.72 0.96 1.2 1.8 2.4 3 kg BOD<sub>5</sub> per day

Nominal flow rate

0.6 1.2 1.8 2.4 3 4.5 6 7.5 m<sup>3</sup> per day

\*According to the size (type) : 4 8 12 16 20 30 40 50

**Waterproofness** (water testing) ..... passed

**Load-bearing capacity by testing** ..... backfilling 0.5 m  
DRY

**Durability** ..... passed

**Reaction to fire** ..... Class E

**Effects of hazardous substances** ..... NPD

## AS-MONOcomp – Dosing equipment version

### CE

ASIO NEW, spol. s r.o.  
Kšírova 552/45  
619 00 Brno, CZ  
19

**EN 12566-3+A2**

Small wastewater treatment systems for up to 50 PE

## AS-MONOcomp

SBR-Process in a single tank with external sludge reservoir and dosing equipment for phosphorus precipitation

Test performed by:  
TUV SUD Czech s. r. o.  
Notified Organisational Unit No. 1017  
Novodvorská 994  
140 00 Prague 4

Cleaning efficiency (at daily organic loading of BOD<sub>5</sub> = 0.24 kg per day)

COD	94.9%	(36.2 mg/L)
BOD <sub>5</sub>	98.2%	(5.3 mg/L)
Insolubles	97.5%	(8.8 mg/L)
NH <sub>4</sub> -N	86.2%	(8.1 mg/L)
N <sub>TOTAL</sub>	83.2%	(13.1 mg/L)
P <sub>TOTAL</sub>	91.1%	(0.8 mg/L)

Cleaning capacity

Nominal organic loading\*

0.24 0.48 0.72 0.96 1.2 1.8 2.4 3 kg BOD<sub>5</sub> per day

Nominal flow rate\*

0.6 1.2 1.8 2.4 3 4.5 6 7.5 m<sup>3</sup> per day

\*According to the size (type) : 4 8 12 16 20 30 40 50

**Waterproofness** (water testing) ..... passed

**Load-bearing capacity by testing** ..... backfilling 0.5 m  
DRY

**Durability** ..... passed

**Reaction to fire** ..... Class E

**Effects of hazardous substances** ..... NPD