

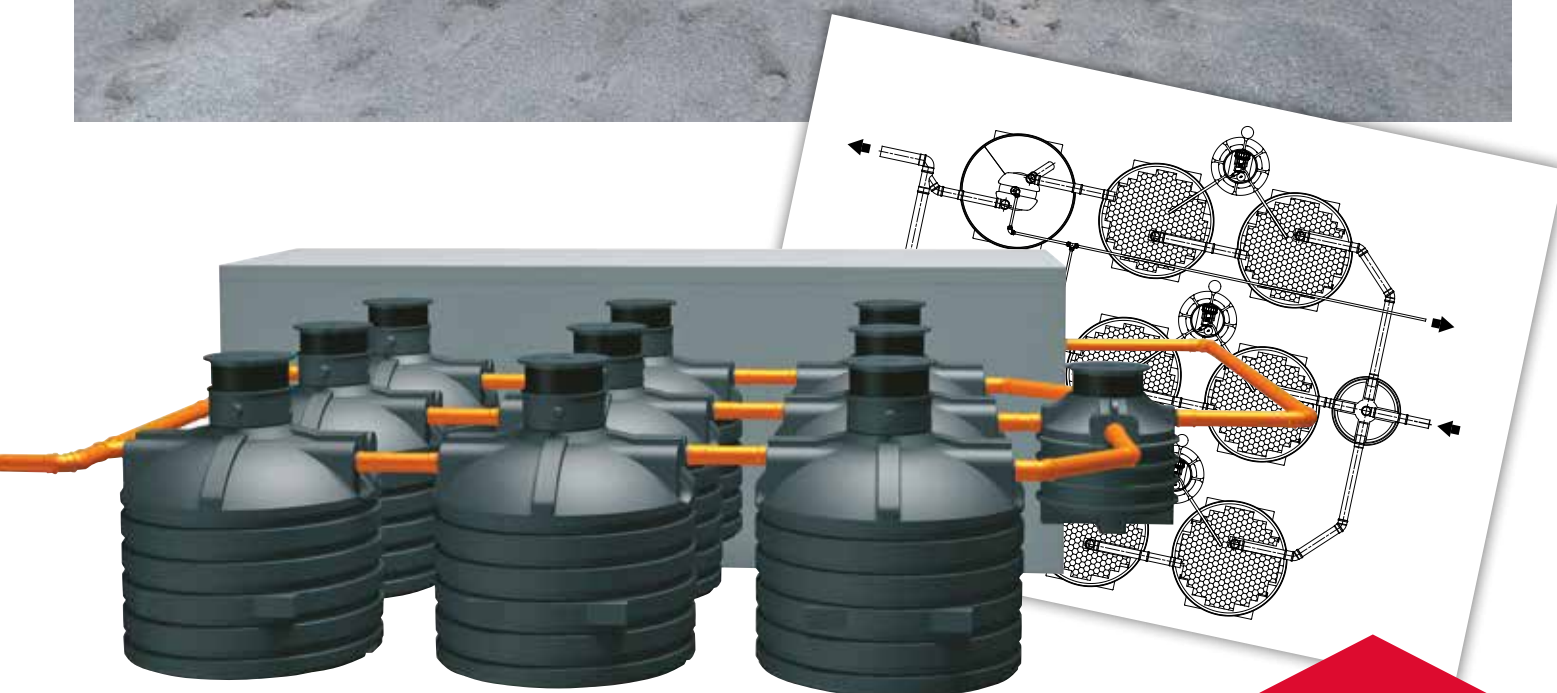
DELPHIN® classic
DELPHIN® combi



Compact wastewater treatment plants

www.delphin-ws.de

DELPHIN Water Systems GmbH & Co. KG
The experts for fixed-bed technology



**Quality
for Your
Project**

Made in Germany

High performance wastewater treatment



Our compact sewage treatment plants of the series **DELPHIN® classic** and **DELPHIN® combi** are systems for the decentralized treatment of domestic wastewater for connection sizes above a population equivalent (PE) of 50. The fully biological clarification of the wastewater is the result of a purification process by means of a submerged and aerated fixed-bed with economical compressor technics. Robust fixed-bed technology and minimized control efforts allow an almost maintenance-free operation of the plants.

Fields of application

- **Living:** Secluded housing areas, small settlements, apartment buildings
- **Leisure:** Hotel complexes, recreational facilities, camping grounds
- **Business:** Commercial parks, shopping malls, office buildings, schools and other facilities, of which accruing sewage is similar to domestic wastewater; such as organically polluted run-off rainwater or silage-leachate from biogas power plants.



DELPHIN® classic series

Complete compact wastewater treatment plants with a single clarification line for operation at facilities with connection sizes up to 220 PE. They consist of up to 8 monolithic polyethylene tanks for underground installation. The tanks can also be installed above ground, if necessary.

Advantages

- Entire wastewater treatment system including primary settlement, biological treatment stage and secondary settlement. The construction of on-site primary settlement basins is not required
- Low space requirements and possibility of flexible installation, e. g. installation of the tanks in a row, parallel or L-shaped
- Gradual free flow plant without maintenance-sensitive feeding pumps
- Low efforts for operation and maintenance

Example: **DELPHIN® classic 80/C/5**



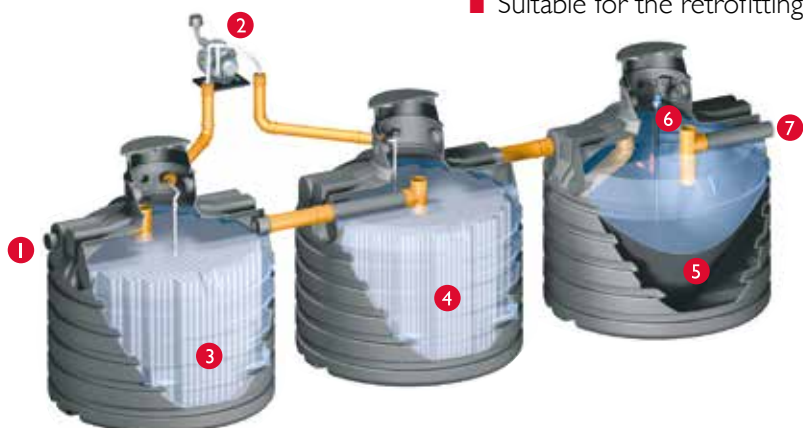
DELPHIN® combi series

Compact wastewater treatment plants with several clarification lines in modular design which are supposed to be installed behind existent primary settlement basins at facilities with connection sizes up to 640 PE.

Advantages

- High adaptability due to modular design and different types of installation
- It is possible to enable or disable single clarification lines of the treatment plant to adapt the plant to varying loadings
- Suitable for the retrofitting or expansion of existing cesspits

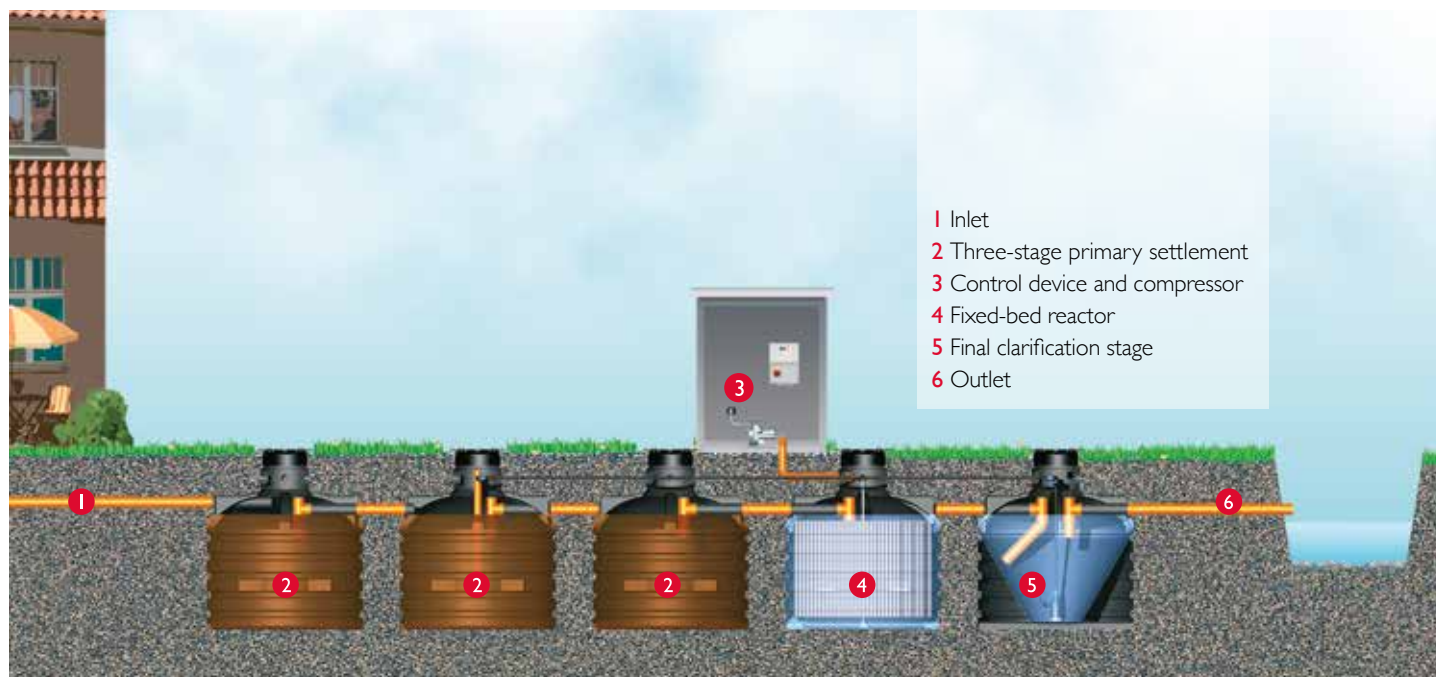
Example: **DELPHIN® combi 480/C/9/DC**



- 1 Inlet
- 2 Compressor
- 3 High-load reactor with 100 m²/m³ fixed-bed
- 4 Normal-load reactor with 150 m²/m³ fixed-bed
- 5 Final clarification stage
- 6 Sludge-removal
- 7 Outlet

Basic module of a **DELPHIN® combi** plant with a two-stage fixed-bed

Complete treatment plants DELPHIN® classic



- 1 Inlet
- 2 Three-stage primary settlement
- 3 Control device and compressor
- 4 Fixed-bed reactor
- 5 Final clarification stage
- 6 Outlet

DELPHIN® classic 80/C/5 – standard model with control device and compressor installed inside a weather protected room

Treatment capacity PE	Grade of treatment	Tanks	Plant type DELPHIN® classic
60	C	5	60/C/5
60	N	5	60/N/5
60	D	5	60/D/5
80	C	5	80/C/5
120	C	6	120/C/6
120	N	6	120/N/6
120	D	7	120/D/7
160	C	6	160/C/6
220	C	8	220/C/8



- 1 Three-stage primary settlement
- 2 Sludge-removal
- 3 Equalization tank
- 4 High-load reactors with 100 m²/m³ fixed-bed
- 5 Normal-load reactor with 150 m²/m³ fixed-bed
- 6 Final clarification stage

DELPHIN® classic 220/C/8 – The largest plant of the classic series

Grade of treatment:	Achievable effluent results at standard dimensioning (1 PE = 150 l/d, 60 g BOD ₅ /d, 1 l g N/d)				
C (carbon removal)	COD: ≤ 100 mg/l	BOD ₅ : ≤ 25 mg/l	–	–	SS: ≤ 35 mg/l
N (nitrification)	COD: ≤ 75 mg/l	BOD ₅ : ≤ 15 mg/l	NH ₄ - N: ≤ 10 mg/l	–	SS: ≤ 25 mg/l
D (denitrification)	COD: ≤ 75 mg/l	BOD ₅ : ≤ 15 mg/l	NH ₄ - N: ≤ 10 mg/l	N _{tot} : ≤ 25 mg	SS: ≤ 25 mg/l

For all plants the installation of the compressor is possible either inside a weather protected room or inside an optionally available technology shaft next to the tanks.

Modular treatment plants DELPHIN® combi



- 1 Inlet from village
- 2 Primary settlement (in concrete construction)
- 3 Distribution chamber
- 4 Three high-load reactors with 100 m²/m³ fixed-bed
- 5 Three normal-load reactors with 150 m²/m³ fixed-bed
- 6 Three final clarification stages
- 7 Collecting tank for biologically treated water
- 8 DELPHIN® clean-kit in a weatherproof operating room
- 9 Storage tank for irrigation
- 10 Irrigation system
- 11 Outlet to drainage (overflow)

DELPHIN® combi 480/C/9/DC & DELPHIN® clean-kit – Wastewater treatment for a settlement with 480 PE and additional sanitation unit for re-use of the treated water in an irrigation system

Treatment capacity PE	Grade of treatment	Tanks	Available inlet models	Plant type DELPHIN® combi
60	C	2	SD, FP	60/C/2/SD, 60/C/2/FP
60	N	2	SD, FP	60/N/2/SD, 60/N/2/FP
60	D	2	SD	60/D/2/SD
80	C	2	SD, FP	80/C/2/SD, 80/C/2/FP
120	C	3	SD, FP	120/C/3/SD, 120/C/3/FP
120	N	3	SD, FP	120/N/3/SD, 120/N/3/FP
120	D	4	SD	120/D/4/SD
160	C	3	SD, FP	160/C/3/SD, 160/C/3/FP
220	C	2 × 1 + 2	DC, FP	220/C/4/DC, 220/C/4/FP
240	N	2 × 3	DC, FP	240/N/6/DC, 240/N/6/FP
240	D	2 × 4	DC	240/D/8/DC
320	C	2 × 3	DC, FP	320/C/6/DC, 320/C/6/FP
360	N	3 × 3	DC, FP	360/N/9/DC, 360/N/9/FP
360	D	3 × 4	DC	360/D/12/DC
480	C	3 × 3	DC, FP	480/C/9/DC, 480/C/9/FP
480	N	4 × 3	DC, FP	480/N/12/DC, 480/N/12/FP
480	D	4 × 4	DC	480/D/16/DC
640	C	4 × 3	DC, FP	640/C/12/DC, 640/C/12/FP

SD = By default the inlet comes straight from the primary settlement basins, e. g. at single-line models.

DC = The equal distribution of the wastewater into the clarification lines is ensured by a distribution chamber.

FP = Lifting of the sewage from deep underfloor levels and/or buffering of peak inflows by feed pumps (max. delivery height = 8 m).

For all plants the installation of the compressor is possible either inside weather a protected room or inside an optionally available technology shaft next to the tanks.

UV-sanitation with DELPHIN® clean-kit

DELPHIN® clean-kit

- Sand filtration system with UV-unit (treatment grade +H, faecal coliforms ≤ 100 cfu/100 ml)
- Retrieval of purified water with reduced suspended solids and microbes
- Allows the resource efficient re-use of wastewater for irrigation



1 Suction pump · 2 Sand filter · 3 6-way-valve (manual or automatic) · 4 Flow meter · 5 UV-reactor

	clean-kit 1	clean-kit 2	clean-kit 3	clean-kit 4	clean-kit 5	clean-kit 6	clean-kit 7
Max. capacity/flow rate	300 l/h	600 l/h	1500 l/h	2800 l/h	5600 l/h	8400 l/h	15000 l/h
UV rated power	16 Watt	25 Watt	64 Watt	120 Watt	200 Watt	300 Watt	520 Watt
Available pre-filters	sand filter; strainer	sand filter; strainer	sand filter; strainer	sand filter; strainer	sand filter; strainer	sand filter; strainer	sand filter; strainer
Available rinsing methods	manual	manual or automatic	manual or automatic	automatic	automatic	automatic	automatic
Available for outdoor installation in GRP box	✓	✓	✓	✓	–	–	–

Phosphate removal with DELPHIN® phos-kit

DELPHIN® phos-kit

- Phosphate adsorption unit (treatment grade +P, $P_{\text{tot}} \leq 2 \text{ mg/l}$)
- Secure and cost-effective method for the removal of phosphate from wastewater without use of chemicals
- Recyclable adsorber granulate
- Possibility of phosphate re-use as fertilizer
- Advanced removal of suspended solids by sand filter



1 Suction pump · 2 Sand filter · 3 6-way-valve (manual or automatic) · 4 Flow meter · 5 Phosphate adsorbers

Your specialist dealer