

# Communal pressure drainage systems



Cost saving | Environmentally friendly  
Dependable | Durable

# An inexpensive alternative



## Pressure drainage systems

### The principle of pressure drainage

Pressure drainage systems have been used in Germany since the end of the 60s. This type of waste water disposal is described as a special drainage procedure in line with the ATV A 116 guideline and is especially appropriate for widely spaced residential and recreation developments with unfavourable topography (flat or hilly territory), and for areas where the ground water level is high or the soil conditions are poor. The pressure drainage method is used for separated systems, i.e. where the foul water is disposed of separately from the rain water.

The drainage of household or communal sewage is carried out with the help of compact pumping stations. A high-quality PE sump equipped with a reliable sewage pump transports the waste water, sometimes via pressure pipelines that stretch for miles. Finally, the waste water is transferred to a public gravity sewer or another pressure pipe. The pressure piping can be laid from the area to be drained to the destination either as a branching network or as a ring network. Modern cutting systems, such as the MultiCut, can be used even for small diameter, DN 32, pressure piping. This minimizes the installation work and saves costs.

If necessary, pressure pipe flushing stations support the waste water disposal. They shorten the waste water's residence time and thus unpleasant odours and the corrosion of the concrete, in particular at the pressure pipe outlet, are avoided. Avoiding residue is another advantage of this additional measure.

### Trust in the successful one

JUNG PUMPEN has been successfully active in the field of pressure drainage for more than 25 years. Numerous reference projects in Europe confirm this success. With more than 100,000 installed systems, JUNG PUMPEN is the market leader in the field of pressure drainage.

### The costs are decisive

JUNG PUMPEN pressure drainage is the cost-effective alternative for communal drainage compared with the conventional gravity sewer systems. It can be installed simply, quickly, irrespectively of the undulations of the land and, thus, inexpensively. Cost-efficiency, dependability and environmental compliance are the decisive criteria which have already convinced several communities to use our system.

It is not just the investment costs for pressure drainage that are particularly favourable, however. Urban sprawl, long routes for the sewers, unfavourable topography or poor soil conditions are points which speak in favour of using pressure drainage. Depending on the application, the operating expenses are also lower. A comparison of the systems in accordance with the „Leitlinien zur Durchführung dynamischer Kostenvergleichsrechnungen“ (guidelines for conducting dynamic cost comparisons) of the „Länderarbeitsgemeinschaft Wasser“ (LAWA - Working Group of the Federal States on Water) proves this by means of a clear cost structure. Investment costs, operating expenses and service life were taken into account. The pre-requisite for objectively comparing the systems is that the comparison be carried out for the same stage of planning. For more information, please refer to the last page.

# Dependable and durable



## The components

### The sump

Certified quality, be it passable and trafficable for cars (PKS-B) or trafficable (PKS-D) for lorries, all sumps produced by JUNG PUMPEN have been approved by the Deutsche Institut für Bautechnik (DIBt – German competence centre for civil engineering).

They need to be long-lasting. JUNG PUMPEN plastic sumps are made of reusable corrosion-resistant polyethylene and are manufactured almost exclusively at our own plastic works. The combination of a smooth surface and an optimised sump floor reduces residues in the sump. The plastic sumps are buoyancy proof and ground-water tight.

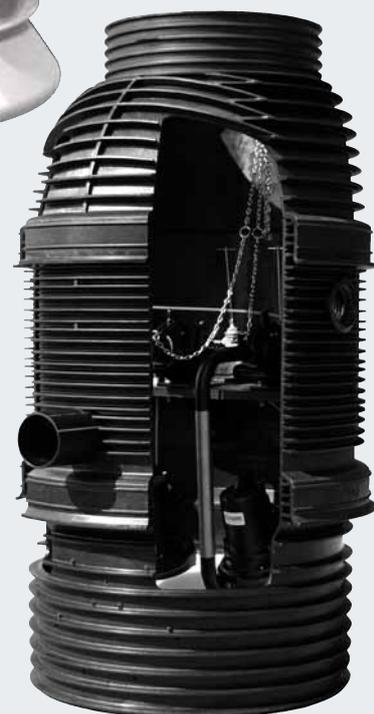
They are placed in the ground without any concreting works. Their compact dimensions and light weight make quick installation possible with a minimum of excavation. The sump is supplied as a complete pump sump with all the required fittings. All fittings are corrosion-free.

A pre-installed above-water coupling system to which the pump can be simply coupled up, facilitates installation and maintenance. A check valve, a stop valve and a flush connection facility complete the package. The sump has a discharge outlet diameter of DN40 (PKS-D 1000) or larger.

Even more comfort affords our new PKS-B 800-32. The sump can be used in trafficable areas. The newly designed above-water coupling system is made of Polyphthalamide (PPA). The coupling unit with integrated ball reflux valve can be lifted out of the sump together with the pump and therefore facilitates an easy maintenance and cleaning. The used composite materials of stainless steel and plastic lets you forget about the usual corrosion incidence.



Trafficable sump up to 12,5 tons  
PKS-B 800-32



Trafficable sump up to 40 tons  
PKS-D 1000

## MultiCut cutting system

In order to meet the requirements of the various pumping scenarios, an extensive range of pump types with various performance curves is available. The submersible pumps with their external and adjustable cutting systems for cutting the usual impurities in domestic waste water provide the greatest possible level of security. The cutting system enables the use of pressure pipes with small diameters, starting with DN 32. With more than 60,000 cuts per minute, impurities containing fibres are disposed of in a secure way.

Flushing tubes which can be fitted onto the pump in special cases ensure an excellent cleansing effect so that residues are hardly able to develop within the sump.



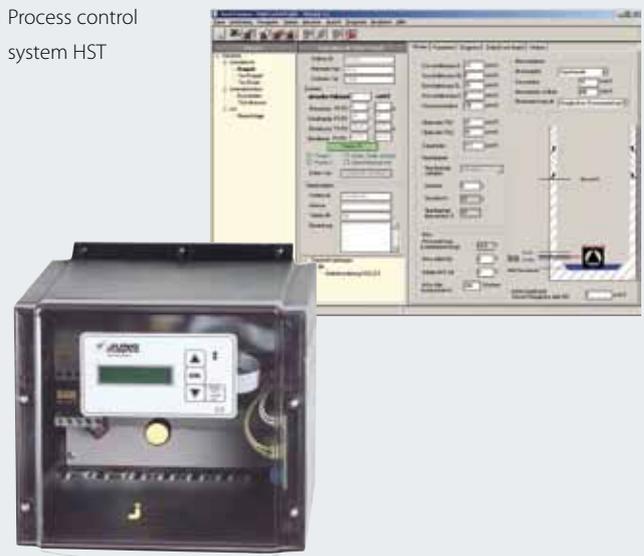
Sewage pump with cutter

## The controls

Various control concepts can be realised. Starting with the electric control unit, then microprocessor controls, and ending with telecommunication and telecontrol from a central control centre, everything can be implemented. The water-level dependent operation of the pumps is regulated by two independent water-level contactors.

This ensures the utmost operational dependability. The microprocessor controls include extensive functions, starting with the event-triggered operations journal, through to the freely definable switching point adjustments, and ending with the data transfer module. Our HighControl software makes the administration of 999 pumping stations, the transfer of freely programmable events via SMS, the graphical assessment of various parameters and lots more possible. And should a complete control centre software package be required in order to monitor and control a variety of systems and pumps, we have our cooperation partner HST as a competent provider at our side.

Process control system HST



Microprocessor controls

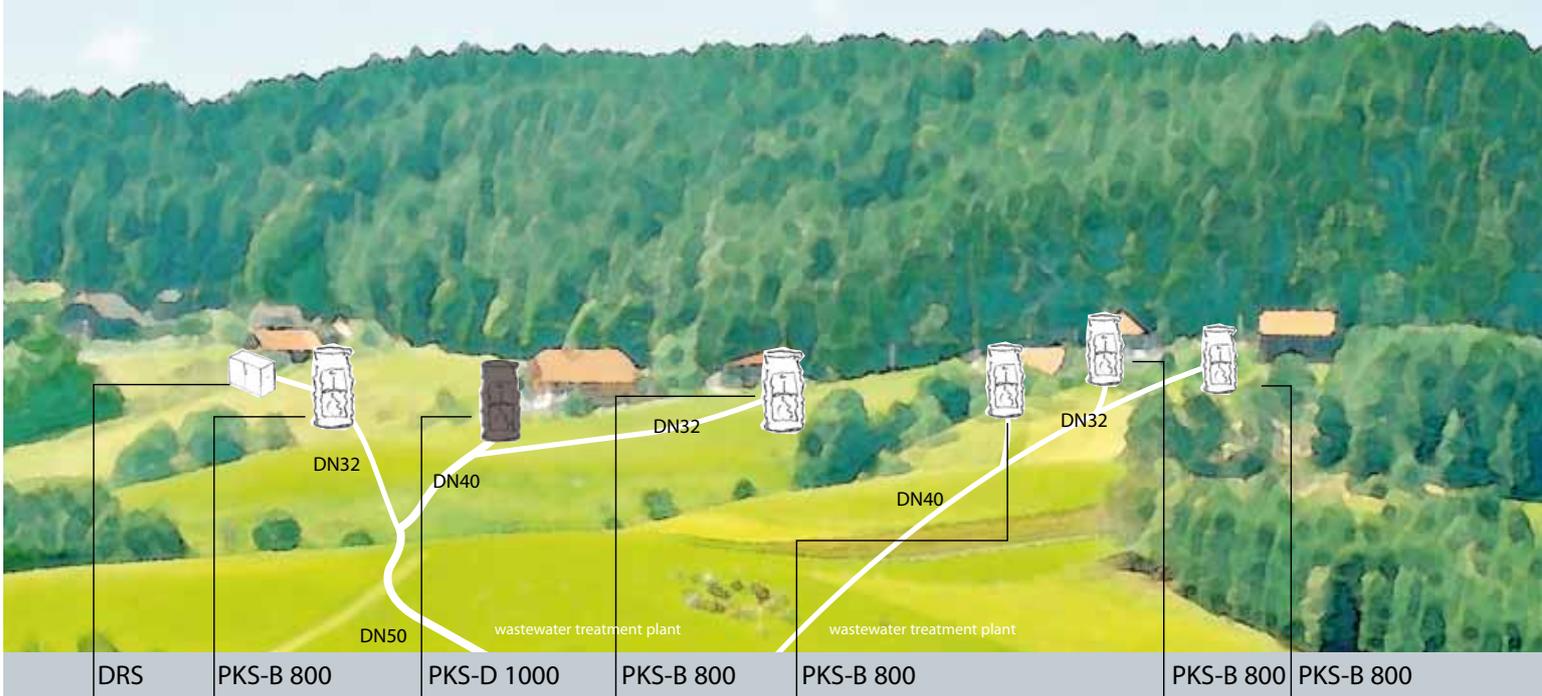
## Flushing to avoid bad odours and corrosion

During the last few years, the sewer networks have expanded on account of the increased centralisation of waste water disposal, which has resulted in correspondingly long dwell times for the waste water in the pipes. At the same time, a drastic decrease in waste water volumes that nonetheless contain the same amount of contaminants was recorded. The septic sewage causes unpleasant side-effects such as bad odours, concrete corrosion, in particular at the transfer stations. Moreover, pressure pipes can become blocked on account of the effluent's long dwell times.

Based on its experience of many years, JUNG PUMPEN recommends the use of pressure pipe flushing stations. They introduce air at calculated intervals by means of a compressor into the waste water pipeline and thus ensure that the pressure pipe is only partially filled. Adding oxygen regularly and swiftly removing the sewage prevents anaerobic processes and thus the "switching over" of the water. Substantial costs for combating bad odours and corrosion can be avoided.

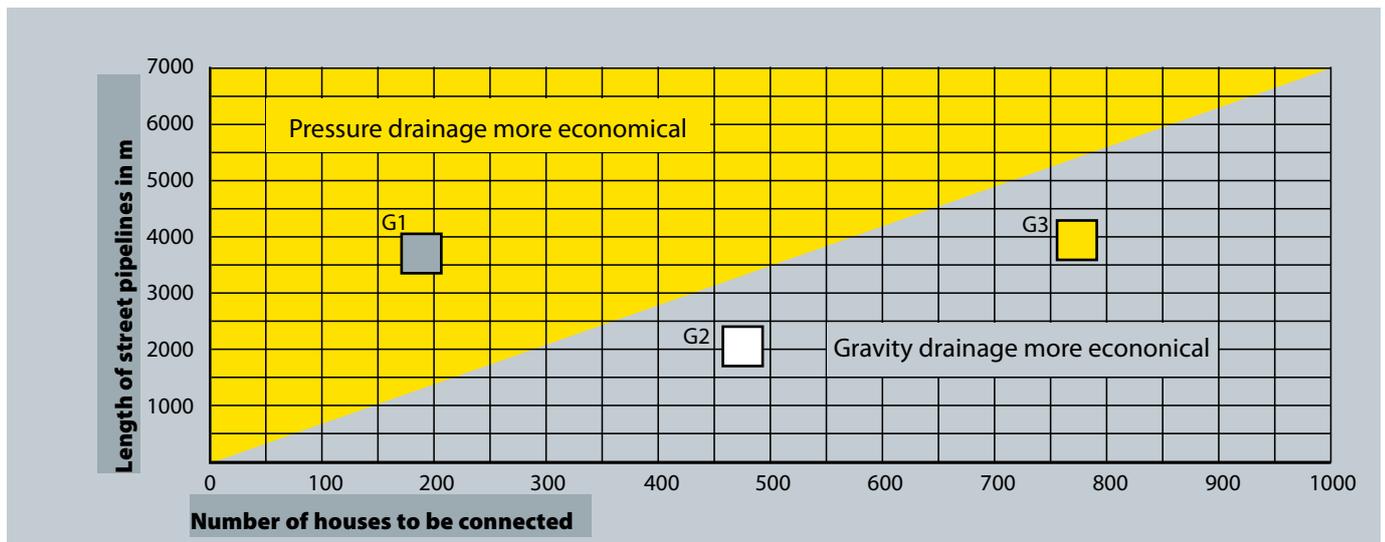


Pressure pipe flushing station



## Comparison of investment costs:

### Pressure drainage against gravity sewers\*



#### Community G1

Connected houses: 192  
 Total pipe length: 3,700 m  
 Ground conditions: normal  
 From the chart it is obvious that pressure drainage is more economical. In this case, investment savings for the community amount to EUR 495,000.

#### Community G2

Connected houses: 477  
 Total pipe length: 2,100 m  
 Ground conditions: normal  
 From the chart it is obvious that gravity drainage is more economical.

#### Community G3

Connected houses: 768  
 Total pipe length: 3,900 m  
 Ground conditions: difficult  
 From the chart it is obvious that a gravity system would be more economical. On account of the ground conditions and the resulting increased costs for e.g. water drainage, a pressure drainage system was nevertheless selected.

\* Calculated for the ground category 3-5, gravity sewers with average pipe diameter DN 250 and installation depth of 2.5 m; pressure drainage with an average pipe diameter of DN 65 and installation depth of 1.5 m. Costs for drainage for gravity sewers, operating costs and maintenance are to be regarded separately. The reference value for the operating costs of the cutting system MultiCut 25/2 M with a water consumption of 100l per resident per day amounts to about 7 kWh per resident per year.

### It all depends on the technology:

- Lower investment costs compared with conventional gravity drainage (depending on the individual case)
- Low energy costs on account of aligned components
- Minimum damage to property, fields and crops
- Simple and swift assembly and low service requirements
- Avoidance of bad odours and corrosion of concrete

### It all depends on the service:

- JUNG PUMPEN carries out the planning for you free of charge
- Project support by competent specialized consultants
- Service provided by the in-house customer service
- Made in Germany – production site in Germany
- High quality standard – ongoing quality control
- Spare parts availability guaranteed for 10 years

## JUNG PUMPEN

### pressure drainage

## Pressure drainage against gravity sewers

### Pressure drainage

- Small pressure pipes starting with DN 32 (with cutting systems)
- Up to about 3,000 m of pipeline can be laid per day
- Parallel installation of drinking water and waste water pipes as well as electrical and telephone lines possible
- Pipe laying independent of the nature of the ground
- Pipe laying is site independent
- Virtually no damage to property, fields or crops
- Low level of disturbance for residents as a result of quick installation
- Flow of traffic is not interrupted
- Durable, flexible PE-HD piping

### Gravity drainage

- Pipes of large dimensions made from concrete or vitrified clay
- Earthworks lasting for months sometimes required
- Parallel laying of various pipes not possible
- Ground layers such as sand and the ground water level must be taken into consideration
- Downhill gradient must be taken into account. Under some circumstances intermediate pumping stations may need to be installed
- Greater damage to property, fields and crops due to extensive earthworks
- Higher level of disturbance for residents due to noise pollution and installation works
- Frequently necessary to close streets
- Risk of fracture with concrete pipes (e.g. due to ground settlement)



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