T.I.P. Technische Industrie Produkte GmbH
Siemensstraße 17
74915 Waibstadt

Tel.: 07263-9125-0
Fax: 07263-9125-25
info@tip-pumpen.de

Booster sets with stainless steel pump housing and pressure vessel

Domestic water supply and pressure boosting

Our booster sets have been specially designed for automatic supply of rain-, service- or ground water to homes and gardens. They are also ideal for pumping water from wells or cisterns, watering, and boosting pressure in piping systems.

More and more households are using rain-, service- or ground water to replace precious and costly mains drinking water for many purposes. Flush toilets are a typical example. For toilet flushing, well water works just as well as mains water. Running washing machines on rainwater is actually better for them. Using rainwater for washing makes no difference to the results, but it is gentler on the machine, as rainwater contains much less calcium carbonate. Booster sets were developed for these and many other domestic water supply applications.

The clear reduction in mains water consumption that is possible with these systems leads to significant and long-lasting household cost savings. At the same time, responsible use of the raw material water makes an active contribution to protecting our environment.

Domestic water supply as a key application

Automatic domestic water supply is one of the key applications of booster sets. Turning on any consumer – for example a tap – results in a pressure drop in the piping system. The pump cuts in when a set cut-in pressure is reached. When the tap is turned off, the pressure go back up. When the cut-out pressure is reached, the pump deactivates.

When it comes to automatic domestic water supply – as with other applications – T.I.P. booster sets are distinguished by two special advantages. Firstly, all our models are equipped as standard with a high-quality membrane. Secondly, T.I.P. booster sets boast pressure vessels in a range of sizes, allowing individual requirements to be fully taken into account when choosing an appliance.

How a pressure vessel works

Pressure compensation containers play a key role in automatic water supply via booster sets. The greater the size of the pressure vessel, the less frequently the pump cuts in. The underlying principle is as simple as can be: the water stored in the pressure vessel prevents the pump from starting up when small amounts of liquid – e.g. a glassful of water – are discharged. The larger the container, the more liquid it holds – and the less frequently the pump cuts in. The pump uses electricity each time it starts up, so a lower frequency of starts means significantly reduced energy consumption, keeping costs down. Another beneficial side effect is that reducing the number of starts means low wear and tear on the system. Fewer starts also means less noise from pump start-up and operation. T.I.P. booster sets are equipped with pressure vessels in sizes ranging from 18 to 22 litre capacity. In addition, two special models with extra-large 50 litre pressure vessels, the HWW 1200/50 and HWW 1300/50 Plus TLS, are available. The options range from compact, space-saving, lightweight variants to extra-large models. These differences give you a choice of products based on your individual requirements and actual on-site conditions.

Highly efficient automatic watering

Another typical application of booster sets is automatic watering. All T.I.P. models are capable of the pressure needed to run watering systems – for example sprinklers – at high-efficiency. Another major advantage for this purpose is the large pressure vessels in T.I.P. booster sets. This is due to the fact that the hoses used for watering are normally long and flexible. Because of their flexibility, the hoses expand when the consumer is turned off to end water discharge, thus ending the watering. This leads to a pressure drop in the system, which a large pressure vessel compensates for to prevent the pump from cutting in again.

Boosting pressure in domestic water systems

One of the most important features of booster sets is their ability to generate or make available a constant pressure. This is a prerequisite for their effective use in automatic domestic water supply. In addition, booster sets are ideal for boosting pressure in water piping systems. This step can be necessary for a variety of reasons. Sometimes, for example, the public water supply is not under sufficiently high pressure. Water is often not at the pressure needed when it reaches upper floors, for instance. In such cases, installing a booster set as a pressure booster is recommended. Cut-in and cut-out pressure can be set precisely, allowing low pressure in the domestic water system to be raised to the correct level.

Stationary installation or mobile use

Booster sets allow the option of either mobile use or stationary installation. If frequently moved from site to site, these systems can be repositioned quickly and with minimum effort. Stationary installation is preferable when there is no need to move the pump to another site or if to do so would be impossible. The screw connections and fastenings needed for installation can be quickly mounted. You are strongly advised to use flexible hoses to connect booster sets and piping, as, unlike rigid connectors, hoses will not transmit vibration to the piping system. A flexible armoured hose specifically designed for this purpose, which is available from us as an accessory, is highly recommended.

Limitations of booster sets

T.I.P. booster sets are extremely efficient and reliable when used for tasks within their range of application – primarily automatic domestic water supply, watering, and boosting pressure in piping systems. For other applications, the use of other pump types is recommended.

It is important to note, for example, that booster sets have a maximum suction head of nine metres. Suction head refers to the height difference between the water surface and the position of the booster set.

Here is an example to explain what this means: if water is to be pumped from a cistern, the cistern water surface cannot be more than nine metres below the pump.

Maximum suction head should not be confused with maximum static head, which as a rule ranges from 42 to 50 metres for T.I.P. booster set. In contrast to suction head, static head refers to the height difference between the water surface and the water outlet. Another practical example will help to clarify what is meant here: a booster set draws liquid from a well with a water surface five metres below the position of the pump. Once the water has reached the booster set, it is pumped 10 metres up to an outlet on a higher floor. In this example, the static head comes to 15 metres.

For all common practical applications a maximum suction head of nine metres is more than enough. Pumping water from any greater depth is beyond the scope of standard booster set. For this purpose we designed the HWW AP 2800 N 20 – a special booster set for deep suction. Its special water recirculation process makes a suction head of up to 20 metres possible.

In addition, submersible pressure pumps have been developed specifically for pumping deep-lying water resources. This pump type is also suitable for automation, allowing liquid pumped from great depths – for booster sets for example – to be used like water from the mains.

Booster sets are ideal for automatic domestic water supply with service-, ground- or rainwater, automatic watering, and boosting pressure efficiently in piping systems.

Choosing the right booster set

Our extensive range of booster sets allows us to offer you the right product for every purpose. The T.I.P. guide will help you find exactly the right pump for your requirements.

When choosing a booster set, there is a broad spectrum of pumps with a variety of equipment and performance characteristics available. Our portfolio ranges from robust starter models to top-class pumps catering to the strictest requirements.

Dry running protection as a key consideration

One of the most important decisions to make when choosing a booster set is whether the pump should have dry running protection. Tried and tested over many years of practical use, this highly reliable and effective technology protects the pump against damage that can occur in the event of overheating of hydraulic parts, too little water, or leaks in the installation. Operating pumps with too little or no water, or with leaking pipes – referred to as dry running – often causes serious damage to these appliances. Booster sets equipped with dry running protection avoid this risk because the pump will cut out in time.

Pre-filters protect the pump from wear

Some of our booster sets come with equipped a high-quality pre-filter as standard. Pre-filters minimise wear and prolong the service life of the pump, as they are highly effective for filtering sand and solids out of pumped liquid. Key advantage: the resistant plastic filter element is easy to clean, so it can be re-used.

As required, booster sets without pre-filters can retrofitted with this recommended accessory at any time. A high-quality universal water filter is available in two different sizes:

G 5: 127 mm (5"), G 7: 178 mm (7").

Our high-quality series of booster sets with stainless steel pump housings and pressure vessels

All booster sets in this series have pump housings and pressure vessels manufactured from stainless steel. Advantages of these high-quality stainless steel types include effective protection from rust damage due to spray or condensation. In addition, this series includes products with dry running protection, pre-filters and a variety of capacities, ensuring that the right pump is available for every requirement.

The HWW 3000 INOX is an ideal starter model in this series. Achieving solid results in all booster sets applications, its 550 watt motor is capable of a maximum flow rate of 2,950 litres per hour, maximum static head of 42 metres and maximum pressure of 4.2 bar. This appliance is perfect for uses requiring lower flow rates without extra-high pressure. Hence this model can run a maximum of one sprinkler.

This series also offers two different higher-performance models. With its extra-high-powered 1,200 watt motor, the HWW 4500 INOX generates a very high maximum pressure of 5.0 bar, maximum static head of 50 metres and correspondingly high maximum flow rate of 4,350 litres per hour. With the ability to run up to five sprinklers, this is clearly a high-capacity booster set.

The HWW 1300 INOX Plus F features an equally powerful motor and is capable of the same maximum static head, flow rate and maximum pressure. The number of sprinklers that it can run is lower – up to four. In addition, this model is equipped with a large pre-filter for low-wear running. With their high performance figures, these two top-class models are recommended for installation in houses or shafts.

Calculations for selection of a suitable booster set

With a few calculations, you can decide whether a booster set has the necessary performance for a specific application or planned installation. The key parameters are the static head and flow rate needed. The pressure required is factored into the static head using a simple conversion formula.

As the first step, it is advisable to calculate the flow rate needed – i.e. the maximum water consumption – using the following information:

Appliance	Litres per minute	Litres per hour
Flush toilet	4 l/min	240 l/h
Sink	6 l/min	360 l/h
Dishwasher	8 l/min	480 l/h
Washing machine	10 l/min	600 l/h
Shower	10 l/min	600 l/h
Bathtub	15 l/min	900 l/h
Sprinkler	10 l/min	600 l/h

An installation requires simultaneous use of a washing machine (10 l/min), dishwasher (8 l/min), shower (10 l/min) and two sprinklers (2 x 10 l/min = 20 l/min) to be possible. These water consumption figures are added together, so the total in this example is 48 l/min. The flow rate finally needed is always 40% of the total. The flow rate is therefore 19.2 l/min in this case. Multiplying this by 60 gives the amount of water per hour needed: 1,152 l/h.

The next step is to ascertain the static head. This is the height difference between the surface of the pumped liquid and the highest-positioned consumer. Here is an example to explain what this means:

a booster set draws liquid from a cistern with a water surface 5 metres below the position of the pump. The water is then pumped 10 metres upwards, since the installation also has to supply a shower in the loft. Other devices – for example a washing machine on the ground floor – are also supplied with water, but this shower is the highest water outlet in this installation. Static head therefore comes to a total of 15 metres in this example, since water has to be transported 5 metres up to the pump and then a further 10 metres up to the shower. To take friction losses in tubing and bends etc. into account, this figure has to be increased by 15%, making a total of 17.25 m.

Next we ascertain the minimum pressure required for the installation, which is determined by the consumer or appliance needing the highest operating pressure. If, for example, an installation has to run three appliances or consumers with desired minimum pressures of 1.0 bar, 1.3 bar and 1.5 bar respectively, the highest of these figures is taken as the minimum pressure. In this example the minimum pressure is therefore 1.5 bar.

This minimum pressure now has to be converted into metres in height. This is done using a simple formula, as 0.1 bar pressure corresponds to a static head of 1.0 metres. Hence we multiply the minimum pressure by a factor of 10. The 1.5 bar minimum pressure in this example corresponds to a static head of 15 metres.

Finally, the figure obtained when minimum pressure was converted into metres in height – 15 metres in this case – has to be added to the previously ascertained static head including friction loss – 17.25 metres in this case. The total comes to 32.25 metres.

After calculating the static head and flow rate needed – 32.25 metres and 19.2 l/min in this case – we can quickly determine whether a booster set has the capacity we require. The higher the flow rate, the lower the static head. Conversely, the flow rate falls as the static head increases. For each booster set we have published a table showing static head and flow rate under a variety of conditions.

When choosing a booster set, it is crucial to make sure that the appliance can provide the minimum values ascertained, otherwise the installation will not function properly. There is on the other hand no risk of choosing a booster set that is too high-powered. If the capacity of a booster set is significantly in excess of requirements, wear on the appliance will be minimal, as it will only rarely have to perform at its limits.

High-quality materials and no compromise on the technology: the keys to the high quality of our booster sets.

- Impact-resistant plastic pump housing.
- Model with compact pressure vessel for space-saving installations.
- All pressure vessels with high-quality membrane.
- On models with dry running protection, our technology effectively prevents the pump against being damaged by running when there is too little water.
- Models with pre-filters for low wear and tear during running.

T.I.P. booster sets are not suitable for pumping salt water or flammable, corrosive, explosive or other hazardous liquids.