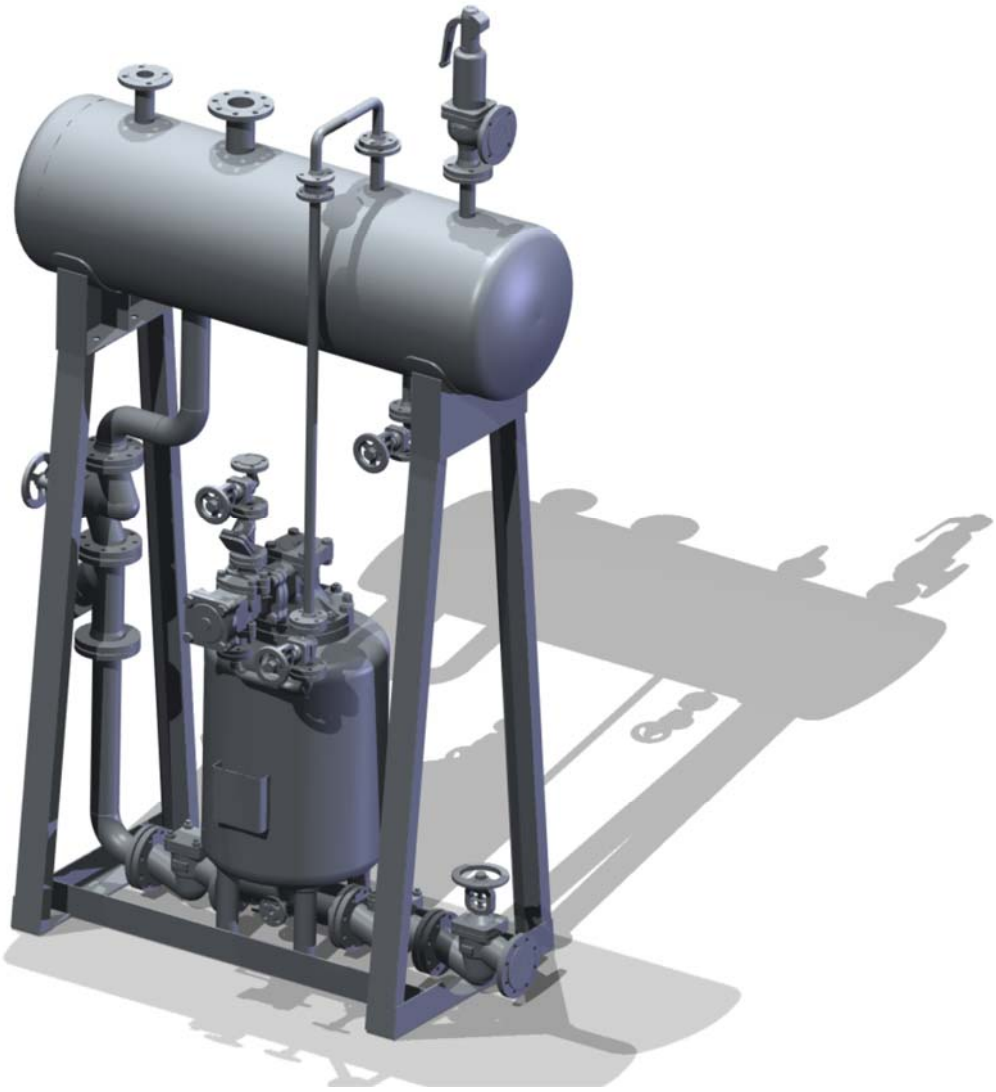
Condensate Lift Systems



Pressure powered condensate pumps.

VOIGT Industrial Systems & Solutions GmbH

Condensate Lift Systems
Engineering
Planning
Software Development

Our products are necessary for a modern condensate management.
Besides our condensate lifters we supply complete condensate stations (modules), headers, collecting tanks, flash vessels, valves and all items which are needed for condensate systems.

The maximum condensate return is an obligatory demand in order to design the steam-condensate -loop as cost-effective as possible and to handle resources as sparing as possible.
To discharge condensate into the drainage, to pollute the drinking water by additional feeding and residual chemicals resulting of the water treatment is not conformable to general requirements of a contemporary environmental protection any more.
The same applies to the avoidable use of additional fuel in case of an overstated rate of fresh water feeding and emissions. The persistent increasing fuel costs additionally demand particular observance.

Think about our children - protect the planet by using energy-saving systems!

Condensate is returned by electric driven centrifugal pumps in many cases in industrial plants.
This leads to high complexity (electricity, electronics) and especially interferences, maintenance efforts and energy consumption causing multiple disadvantages. Additionally traditional condensate return systems are intrinsically tied to high machinery investments and cause costs for maintenance, support and servicing.

High functionality, permanent availability in continuous use, simple and robust design, fully automatic operating without electricity or electronics, energy and personnel cost savings are just a few of the characteristics of condensate return systems from VOIGT.
The VOIGT-Lifter is the top-quality alternative solution compared to conventional pumping systems.
Condensate problems - for pressureless or pressurized condensate or vacuum - could be a thing of the past soon!

Steam / Condensate / Process Technology—Fields of application

Power Plants	Refineries	Chemical Industry	Others
Turbine drain	Single and Ring-Systems	Condensates (LP, HP)	Paper industry
Air preheating	Product delivery	Line drain	Sugar industry
Waste heat boiler	Condensate return	Process fluids	Breweries
Supporting systems	Benzene delivery	Flare gas drain	and many more!

VOIGT-Lifters deliver from pressureless, pressurized or vacuum tanks, or pipings, feed low-und high-pressure boilers, transformers or boilers or are as well as in pressure increasing systems.

Everywhere, where condensates or heated liquids have to be delivered, the VOIGT-Lifter becomes the first choice for plant improvement as well as for technical perfection.

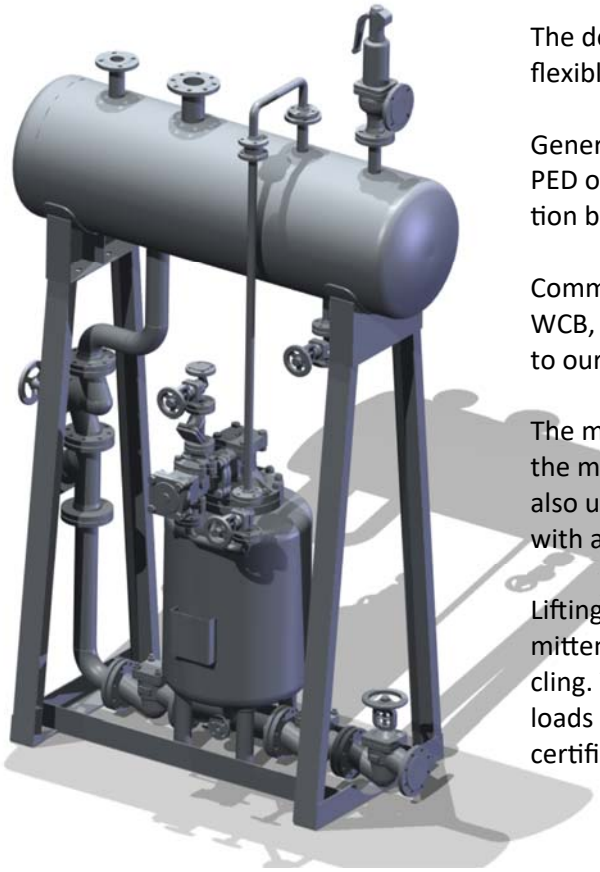
Deliveries—worldwide

Ruwais AbuDhabi, Statoil Norway, Marun, Asaluye Qatar, Constanta Romania, OMV Schwechat Austria, Tisza Hungary, Slovnaft Slovakia, Plock Poland, Coya Sur Chile, QCY Qatar, TECEN, Izmir Turkey, Arvand Iran, Kalush , Tobolsk, Ukraine, FCC Petrom Romania, SABIC Germany, Sayansk Russia, Safco Saudi Arabia, Sonne Germany, KOOP Netherlands, Premnitz Germany, Delfzijl Netherlands, Panterko India, Zhuterko China, Jiaterko China, Sinterko , Sailing Viking Denmark, Cargill Germany, Gent Belgium **and many more!**

VOIGT-Lifter—BASICS

VOIGT-Lifters work fully automatic, service-free and maintenance-free, without electricity, electronics or any other control systems.
The VOIGT-Lifter replaces electrical driven pumps.
When condensate flows into the lifter, the lifter starts working fully automatic.
The VOIGT-Lifter has a practically unlimited durability due to the fact that its construction is as simple and robust as possible which includes the internal design where any filigree parts like feathers or springs or any fine mechanics are not in use.

The system is simple and—most important— it works!



The design is as standardized as necessary and as flexible as possible.

Generally all VOIGT-Lifters are designed according to PED or ASME-Code including pressure test and inspection by NB (TÜV) for each lifter!

Common materials are P265GH, SA 516 Grade 60, A216 WCB, A351 CF8M and many other materials according to our customer's specifications.

The max. design pressure for VOIGT-Lifters is 31 bar, the max. design temperature 300 °C. VOIGT-Lifters are also used for special cases like ethylene return systems with a design temperature of minus 104 °C.

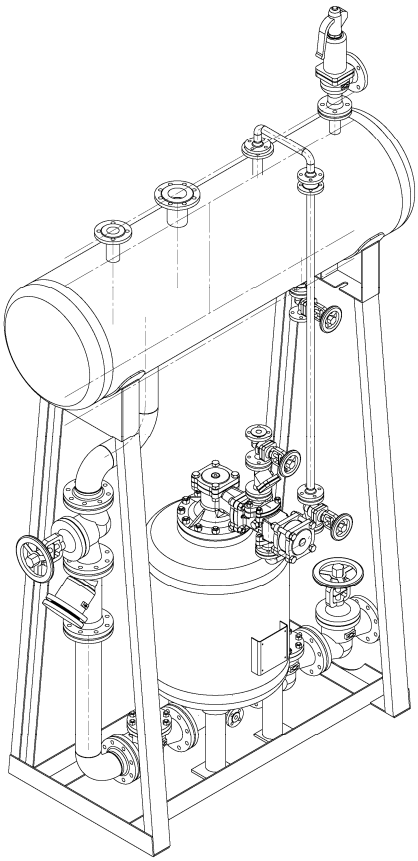
Lifting systems work continuously, however intermittently, whereby these are subject to a pressure cycling. VOIGT-Lifter are generally appropriate for these loads and/or load changes, they are certified as **pressure cycling resistant**.

VOIGT-Lifters can be supplied as

single lifter, complete condensate module (mounted on base plate with steel structure, internal piping and all necessary valves, delivered ready for installation).

VOIGT-Lifters can be installed redundant, they can be installed in row (to get higher capacities), they can be installed as small size together with a bigger size and many more!

The design, manufacturing, inspection and documentation includes generally our customer's specification for each single project which leeds to high flexibility regarding general arrangement, materials, inspection, codes and standards, languages and so on.



VOIGT-Lifter in action:

The condensate flows into the VOIGT-Lifter from a collection tank through the suction line of the lifter. These condensate collection drums are considerably smaller than the tanks of conventional pumping systems. The size of the collection drum ranges only from 100 to 600 l for single systems.

With an increasing liquid level the built-in float moves upwards and activates the exterior attached control. The steam-inlet valve opens, the delivery process starts. The pressure in the VOIGT-Lifter rises, the condensate is displaced by steam.

This process is nearly noiseless and furthermore condensate impacts are averted by the special design of the VOIGT-Lifter.

The VOIGT-Lifter works as long as condensate is provided and shuts down when no condensate is available. **Fully automatic.**

With the decreasing condensate level in the VOIGT-Lifter, the internal float slides downwards and activates the control again. The steam inlet valve closes and the steam outlet valve opens. The residual steam is led into the condensate collection drum through the venting pipe with a simultaneous flow of condensate into the lifter. The operation cycle is finished and the next operation cycle can start.

The VOIGT-Lifter works and is unequalled concerning its industrial fitness.

In the harsh condensate economy it depends on simplicity and robustness. Filigree or rotary functional parts, feathers/springs or tilting and/or drop weights for the control of the switching operation are not suitable to fulfil these requirements!

The variety of application areas is reached by no other lifting system. The simple pressure-free condensate station and as well the multi-level high-pressure and vacuum evaporation system can solve condensate problems technically perfectly and above all conceivably simply.

Performance

8 Types with a single capacity from 20 l/min (1.2 t/h) to 250 l/min (15.0 t/h)

Max. capacity for lifters installed in row: 60 t/h

Design (Codes/Standards): DIN/PED/ASME

Special Design Codes like China-Stamp, ASME U-Stamp, IBR, GOST

Special variants (flanges, standards, customized constructions), as well as complete solutions (incl. planning, concepts, mounting) on request!

Type	01	02	03	04	05	06	07	08
Capacity l/min	20	33	50	90	120	150	200	250
Connection Mmedium	DN 50 NPS2	DN 50 NPS2	DN 50 NPS2	DN 80 NPS3	DN 80 NPS3	DN 80 NPS3	DN 100 NPS4	DN 150 NPS6
Connection Motive medium	DN 25 NPS1	DN 25 NPS1	DN 25 NPS1	DN 25 NPS1	DN 25 NPS1	DN 25 NPS1	DN 25 NPS1	DN 25 NPS1
Min. suction head mm	1400	1500	1700	1800	2000	2000	2300	2500

- Design and manufacturing according PED/ASME, pressure cycling resistant
- Standard design -1 to 25 bar, 300 °C
- Vacuum resistant
- Generally EC-Type Examination, or ASME
- Conformity to all rules for pressure vessels
- Corrosion allowance acc. customers standards
- Suitable for fluid group 1 and 2
- Steering parts get not in contact with lifting medium
- Solely flanged connections, free from leakage
- Fully automatic: no electrics, no electronics, no control systems
- Simple, robust, clearly arranged
- Erect, connect, forget
- Maintenance-free
- Particularly effective for hot condensate or condensates from vacuum
- Energy and personnel cost savings
- Innovative and future-proof investment
- Flashing impossible

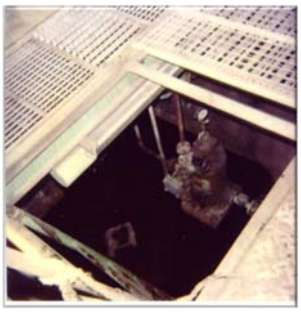
We proudly present: The VOIGT-Lifter

Hello, I am the Voigt-Lifter. The reason I got this name is that I am transporting fluids from one level to a higher level, so you can say I am lifting fluids. I'm doing this lifting by using a so called motive medium which has to be gaseous, like steam or nitrogen or compressed air.
I'm well designed and because of this I'm staying a long time with my owners and they get used to me. Most of the times I am soon in company of other Voigt-Lifters.

Unfortunately there are bad copies of me on the market. They are designated as lifters as well but they don't reach my level of performance. They don't stay with their owners for long times and then go down the tubes. Then they need me to do it better. Of course that's a pleasure for me.

I don't want to show off but with me (and these are the facts) you can:

- Save energy (I'm just working with a motive medium and that stays in the system and I don't need any electricity)
- Save costs (I'm maintenance-free and autonomous that means that I don't need any attention, besides my durability is nearly unlimited which means that I will get very old)
- Do everything (I'm very undemanding regarding the circumstances of my environment so I don't care about low or high temperature, vacuum or high pressure or pressure cycling and I'm very versatile since I'm available in diverse materials and 8 types and according to many standards (DIN, ASME with or without stamp, China-Stamp, CS or stainless steel, PN 16, 25 or 40, ANSI Class 150 or 300 and so on and so on and so on).
- **I'm working for you—in good times and in bad times...**



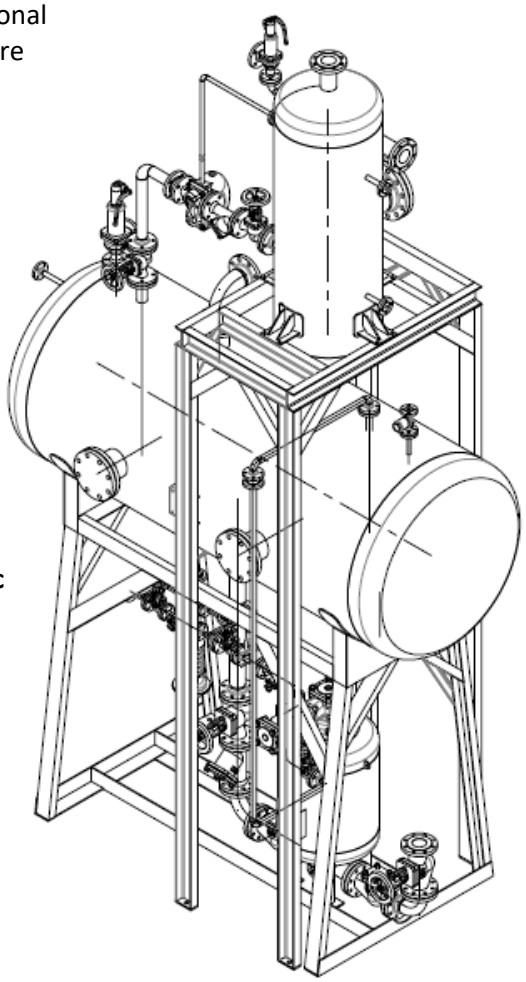
Ohne Elektrik
Ohne externe Steuerung
Komplett mechanischer Prozess
Funktionsfähig auch unter extremsten Bedingungen

Planungshinweise

The **cost-benefit ratio** is extraordinarily favourable.
Capital goods must be used today more intensively than ever and have to be permanently available on a long-term basis. Apart from installation costs, subsequent costs of the service life arise. The costs of maintenance, inspection as well as repair, service and training essentially determine these subsequent costs. It is meaningful to also take into consideration the factor "maintenance" and its costs in planning and procurement procedure.

The topic „condensate“ carries negative connotations for many companies. This is justified by many problems like corrosion, leakage, cavitation, maintenance-intensive systems etc. Most of the times the solution is "more of the same", which means that always the same systems are in use which lead to always the same problems.

Also in plant engineering automatic technical operational sequences are generally aimed at, which requires more extensively and usually more complicated as well as maintenance-intensive technology, which is besides more interference-prone and for which more special personnel is needed.
This affects even the later operator / end customer, who must be first qualified by extensive **training** in many cases.



The topic „condensate“ is not complex and complicated and it is surely not an unsolvable problem.

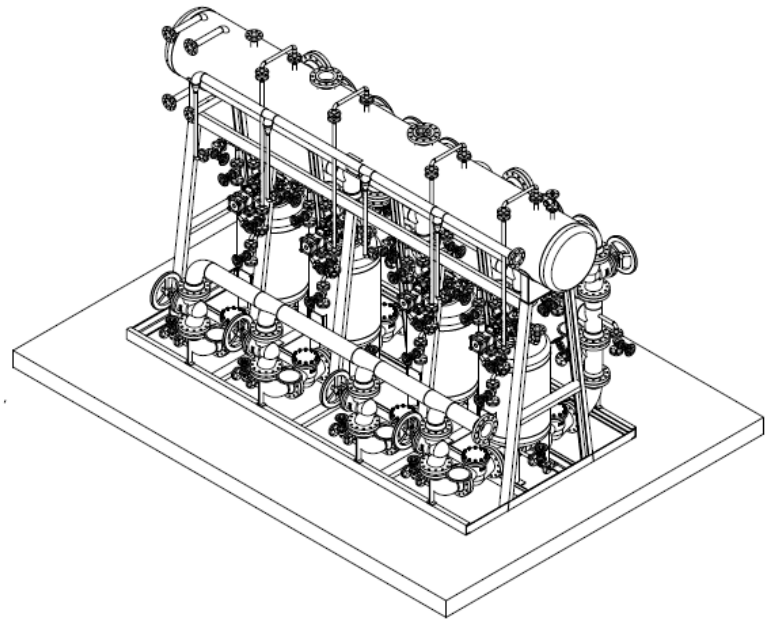
Make a change, with us!

The VOIGT-Lifter already represents a **fully automatic working system** in its basic concept , which does not require additional control or regulation and no further accessories.

This very substantial reduction of the technologically components on a **functional single device** means that all the above-mentioned problem areas are not relevant in cases of the employment of a VOIGT-Lifter.

Our goals:

Professionality - in consulting, planning and design of efficient and easy to use condensate systems.
Simplicity - fully automatic and clearly arranged.
Maintenance-free - without electricity, electronics or filigree parts like springs.
Solving problems -instead of creating new ones.



Planungshinweise

The VOIGT-Lifter was developed originally for the condensate return and has a **successful tradition** for nearly 50 years now since 1963.

Due to its **outstanding performance characteristics** the employment takes place for decades for the delivery of liquids in process technology. In condensate nets the appropriate lifting medium is steam, whereby other driving media suitable for each individual case can be used (compressed air, nitrogen, inert gases).

If the vessel of the VOIGT-Lifter is filled with condensate, positive pressure steam enters the lifter through the outside flanged mechanical control and displaces the condensate over the pressure pipe into the follow-up systems or returns it to intermediate and/or master stations as well as in many cases directly to the boiler house.

The Steam works thereby in a general manner like the piston of a piston pump - however with the difference that the displacement takes place extraordinarily flexibly and thus smoothly. After the working stroke this driving steam must relax. This is made by the above-mentioned control, which closes the steam entry reliably in this phase and which opens the internal steam exhaust valve dead centre-free. This venting piping attached at the VOIGT-Lifter is connected in standard systems with the condensate collection tank, i.e. relaxed steam mixes there with the condensate, condenses and delivers its warmth (incl. mass) to this.

During this relaxation procedure therefore the work space of the VOIGT-Lifter is connected with the collecting point of the condensate. Thus pressure balance exists between both places, why condensates of different operating conditions (pressure-free, overpressure or vacuum) can flow and be delivered to the VOIGT-Lifter. This circuit way represents the standard application for normal condensate stations, i.e. the oil-free working steam remains energetically to the system in direct form. In addition, the energy recovery line used thereby can be led to any different place with pressure-free condensates and with hot condensates or overpressure condensates in order to use heat and mass there (e.g. also directly in the deaerator).

In **vacuum systems** the relaxation line must be connected with the origin place of the condensate, since otherwise no condensate could flow into the VOIGT-Lifter without pressure balance. This system type is preferably used for vacuum rejection, which is widely-used in particular for turbines, condensers, heat exchangers and such.

The **various operating and application advantages**, including the price performance ratio become effective for the end customer in full width, as also for the external operator (Contracting) as it allows offers with competitive conditions concerning the initial costs and maintenance contracts (no further equipment like electrical connections, electronics, automatic controls) which also includes all problems of **guarantee** or **documentation**, **instructing and servicing.**

Planning Condensate Systems

The following **BASIC CONDITIONS** have to be considered for planning and design of condensate lift systems:

The minimal **suction head** has to be kept in any case (see table on page 6).
The pressure of the **motive medium** has to be 2 bar higher than the counterpressure after the lifter.
The pressure of the **motive medium** (steam, compressed air etc.) shall be between 2 and 15 bar.

Engineering and Service

We will workout solutions for new and Improvements for existing systems in cooperation with you.
With our nearly 50 years lasting experience in all areas of condensate technology we can provide expert knowledge even for complex tecnical problems.
We further provide engineering services for special cases and flexible solutions according to our customer‘s specifications.

Condensate systems with Voigt-Lifters are flexible enough for specific needs and standardized enough for creating advantages like low spares inventories.

Besides production we offer additional services: Service and support around the clock.
A customer stays customer even after the job and of course we wioll help you if there are any questions left. Many of our customer's works do not stand still at the weekend and thats why we are available for you: 24 hours a day, 8 days a week.

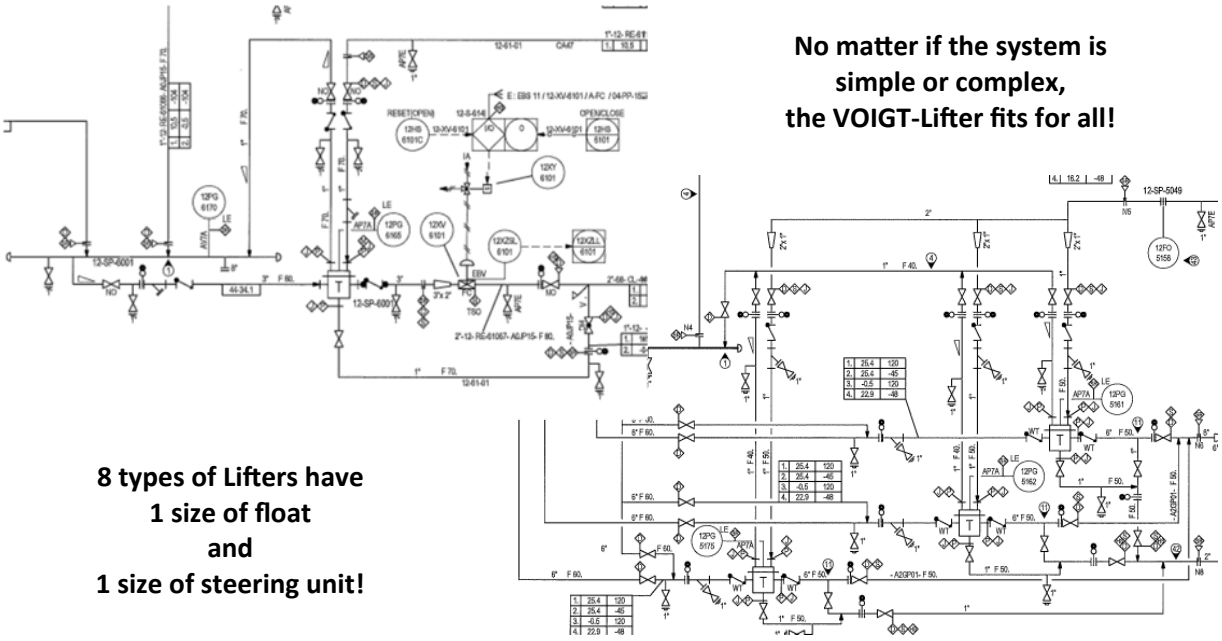
New ways:

The condensate issue has a negative impression for many companies and with good reason: corrosion, leakage, fault liability, maintenance-intensive systems are common problems of condensate economy.

The condensate issue is not complicated and it is definitely no unsolvable problem!

Go a new way with us!

VOIGT-Lifter, a standard and flexible solution



No matter if the system is simple or complex, the VOIGT-Lifter fits for all!

8 types of Lifters have 1 size of float and 1 size of steering unit!

One system fits for:
Condensates under overpressure
Vacuum
Non-pressurized condensates
Nitrogen
Ethylene
and many more!

VOIGT-Lifter.
Maintenance-free.
Fully automatic, no electricity.
No control systems.
Simple, robust, clearly.
Erect, connect, forget.

Condensate Lift Systems

Further information and contact

We issued some important planning advices for you.

If you have further questions you may find all answers in our FAQ.

For all other infomation please contact us via phone +49 8684 2093744 via

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