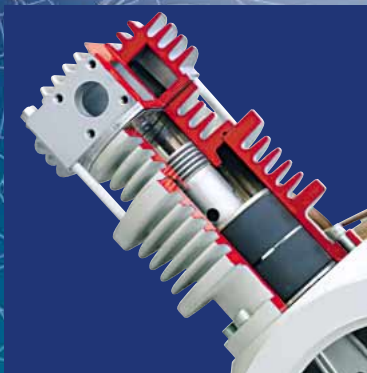


HAUG

COMPRESSORS

COMPRESSORS FOR ABSOLUTELY CLEAN COMPRESSED AIR AND SECURE GAS COMPRESSION

- Oil-free
- Reliable
- Economical
- Environmentally friendly



- Piston compressors
- Screw compressors
- High pressure compressors
- Booster compressors
- Gas compressors

2
3

COMPRESSOR COMPETENCE FROM ST. GALLEN

Fritz Haug AG is the leading manufacturer of oil-less and dry-running piston compressors, for the compression of compressed air and gases. We develop and produce oil-free compressors, which excel due to their reliability and long life cycles.

The construction kit system of the HAUG compressors allows easy and cost effective realisation of different applications. Our compressors are available, according to customer specifications, in 1 to 4 stage compression, with inlet pressure, water or air cooling, and for the compression of gases in a hermetically sealed version.

We have developed outstanding technical solutions in the field of oil-free compression and in the course of time continually improved them. Due to their reliability the HAUG compressors provide a convincing solution for all the sensitive areas where oil-free quality demands are required.

HAUG gas compressors can also be equipped with a magnetic coupling drive. This hermetically sealed compression and maintenance free driving system is a HAUG development, applied for the first time with piston compressors. HAUG gas compressors with magnetic couplings a lower price alternative to diaphragm compressors.

WE ARE MANUFACTURERS OF
OIL-FREE PISTON COMPRESSORS

HAUG THE SPECIALIST FOR OIL-FREE PISTON COMPRESSORS -
FOR COMPRESSED AIR AND GASES

RELIABILITY - FOR SENSITIVE
APPLICATIONS

ECONOMICAL - THANKS TO
MAGNETIC COUPLING DRIVE



«OUR GREAT
EXPERIENCE AND THE
HIGH QUALITY OF THE
HAUG COMPRESSORS
MAKE UP THE BASIS
FOR RELIABLE AND
ECONOMICAL
SOLUTIONS.»

Beat Frefel
General Manager Fritz Haug AG

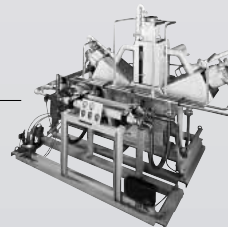
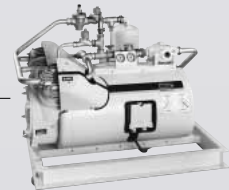
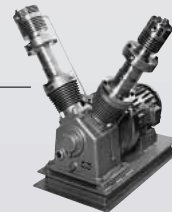
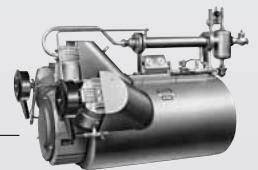


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MILESTONES OF FRITZ HAUG AG

- 1896 Founding of the enterprise – work on repairs and general construction of machines and equipment
-
- 1916–1948 Through this period in time Fritz Haug constructed outstandingly modern compressors
-
- 1928 Air compressor K65
Applications in garages, colour spraying, and motive power engineering
-
- 1953 Oil-free compressor KK120
Development of the first oil-free piston compressor with cross-head
-
- 1957 Set up a new factory in St. Gallen with progressive job placement and modern manufacturing facility
-
- 1968 New world-wide:
The first completely oil-less piston compressors SO and BO, dry-running with enclosed sealed roller
-
- 1973 Development of the oil-less piston compressor type TO
Even today this compressor makes up the basic construction for many applications.
-
- 1978 The first gas compressor VOGG 100/60 for 80 bar in applications in the recovery and storage of gases
-
- 1984 Extension of the factory shop floor and the establishment of a complete 24 hour customer service
-
- 1989 New world-wide:
First gas compressor with a frictionless magnetic coupling 100% gas-tight and absolutely maintenance-free
-
- 1992 Oil-free gas compressor type MOPG with cross-head
Compressor installation with 45–75 kW driving power to compress diverse gases like helium, natural gas, and oxygen.
-
- 1996 Together with our customers we celebrated 100 year company jubilee
-
- 2002 Turn-key solutions for the gas industry
Container-equipment with two oil-less gas compressor types TOG for the recovery of leakage gas





TRADITION OBLIGES

When Hans Haug set up his company in St. Gallen 1896, the young enterprise was a repair and delivery workshop. In 1925 the first piston compressor was constructed, and from 1928 a series of air compressors were produced. Fritz Haug AG always remained true to its word – by innovative new products - first world-wide solutions – but especially through a resolute company philosophy, as well as the promise of high quality products and services.

What can you expect from us in the future?

The continual further development of dry-running technology backed up by recognition of the newest research technology. Our goal is to strive for high reliability with the lowest total costs. A further development that we have been pursuing is to raise the discharge pressure to 200 bar – naturally oil-less and dry-running.



6
7

OIL-LESS AND DRY COMPRESSION – A HAUG SPECIALITY

HAUG is the inventor of oil-less and dry-running piston compressors. These compressors in their entirety require no oil, be it in the guiding and compression part, or in the drive-set.

With continuous research and development we have improved and optimised the dry-running technology. For decades HAUG compressors have proved themselves in difficult operational conditions and climatic environments. HAUG dry-running compressors are ideal for continuous operations, intermittent operations, and emergency operations with practically no running in time.

THE DRIVE MECHANISM: THE HEART OF THE HAUG COMPRESSORS

The crank mechanism works with specially patented roller bearings. These are greased for life with a special synthetic lubricant, and are frictionless sealed. The life time of the roller bearings, depending on type and application, is between 10,000 and 20,000 operating hours.

OIL-FREE COMPRESSION: CONVINCING ADVANTAGES

The high investment costs of oil-free compressors are directly paid back by lower operational costs. The oil-free compression offers a better quality of gas, higher security of production, much lower costs for air treatment and there are no disposal costs for oily materials and condensate. Many users are obliged to utilise oil-free compressed air in processes. For this reason they resolutely opt for an oil-free compression system, which allows no oil-aerosols or oil-vapour to contaminate the process. Oil-vapour can only be removed with activ carbon filters, which after a short time become ineffective and in turn a perpetual security risk.



Piston – connecting rod subassemblies.
Ready to install subassemblies with special roller bearings and large teflon base for guidance piston. Lightly built of aluminium. Replaceable with a few hand grips.



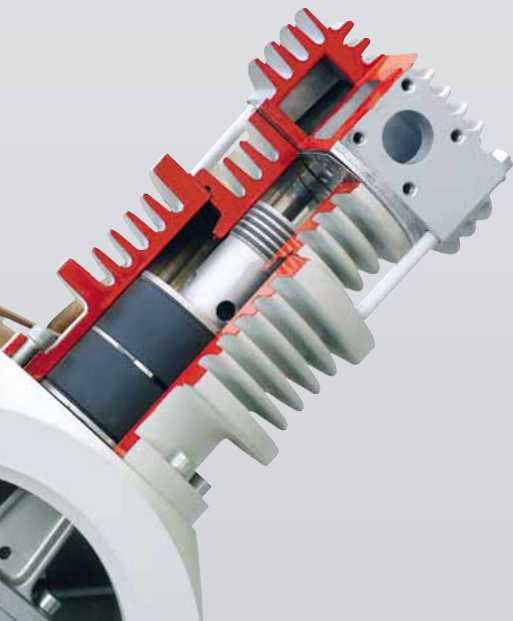
Piston rings
Efficient, 2-part compression rings for consistent level of flow-rate for the whole period of operation. The choice of ring material and ring form correspond exactly to the compression media, application requirements, and the smooth cylinder surfaces.



Compressor valves
Combined stainless steel suction and discharge pressure valve. Due to the large flow cross-section they yield very small pressure losses. The valves are frictionless.



Cylinder
The rust free cylinders surfaces are coated, honed with special machines, thermally tempered and hardened





REFERENCES AIR COMPRESSORS

Numerous internationally acclaimed enterprises fit HAUG oil-free air compressors into their systems.

ABB	Energy technology
ALSTOM	Energy technology
AVENTIS	Pharmaceuticals
AXIMA	Infrastructure technology
BASF	Chemical industry
BKW	Power-station technology
BOSCH	Electronics
BÜCHI	Laboratory equipment
BÜHLER	Foodstuff industry
CARBAMED	Medical technology
DRÄGER	Medical technology
DAIMLER	Car manufacturer
EDELEANU	Plant engineering
EMS	Chemical industry
FAS	Electronic industry
HÄNY	Water plant technology
IVERS-LEE	Packaging
KSB	Plant engineering
LONZA	Chemical industry
LURGI	Plant engineering
MIGROS	Foodstuff industry
MEDGAS	Medical technology
NOVARTIS	Pharmaceutical industry
NESTLE	Foodstuff industry
OPEL	Car manufacturer
PANGAS	Medical technology
PSI	Research Institute
POLYPACK	PET-Packaging
ROCHE	Pharmaceutical industry
SCHOTT	Glass manufacturer
SIEMENS	Electronics
SULZER	Plant engineering
TIWAG	Power-station technology
VA-TECH	Plant engineering
VARIAN	Laboratory equipment
ZELLER	Pharmaceutical industry

8
9

HAUG PISTON COMPRESSORS FOR OIL-FREE COMPRESSED AIR

HAUG guarantees technically and economically optimal solutions for compressed air supply, with the security of a constant oil-free quality of the compressed air.

Universal ways of operation

Often the compressed air requirements are not calculable. Reserve capacities have to be built in.

Likewise security reasons make it recommendable to install redundant compressed air supply. The compressors are consequently faced with long standstill periods and frequent idle run operation. Due to the dry-running technology the HAUG piston compressors can be out of operation, without causing any problem compared to lubricated-compressors and screw compressors. The dry-running piston compressors can be turned off when the maximum discharge pressure is reached. Operation in idle run mode is not required. This means less running hours and results in lower energy and maintenance costs.

Universal application for:

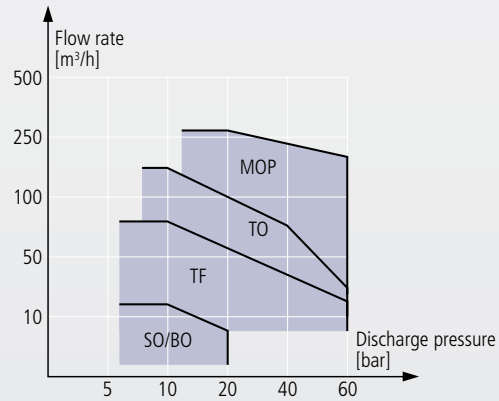
- Continuous operation
- Intermittent operation
- Emergency or reserve operation

Standard Compressors and Special Installations

HAUG piston compressors are based on a modular system. Customer specific requirements and special solutions can be cost effectively accomplished.

Many variations of oil-free piston compressors:

- Standard compressors for maximum discharge pressure 6–14 bar
- Booster compressors with suction pressure up to max. 16 bar
- High pressure compressors for maximum discharge pressure up to 85 bar
- Ex-protected compressors



Type SO/BO

- Oil-less, dry-running trunk-piston compressor
- 1- or 2-stages
- Driving power 0.3–2.2 kW
- Direct drive
- Air cooled



Type TF

- Oil-less, dry-running trunk-piston compressor
- 1-, 2- or 3- stages
- Driving power 4–11 kW
- Direct drive
- Air cooled



Type TO

- Oil-less, dry-running trunk-piston compressor
- 1-, 2- or 3- stages
- Driving power 5.5–30 kW
- Direct- or belt drive
- Air- or water cooled



Type MOP

- Oil-free, dry-running compressor with cross-head
- 1-, 2- or 3- stages
- Driving power 30–75 kW
- Belt drive
- Water cooled



**IF HYGIENE COUNTS:
OIL-FREE COMPRESSED
AIR FOR MEDICAL
APPLICATIONS**

Hospitals require absolute clean compressed air. Therefore for many years Swiss hospitals have installed only oil-free compressors, namely from HAUG.

Oil-free compressors from HAUG are installed in many hospitals all over the world and have proven their reliability.



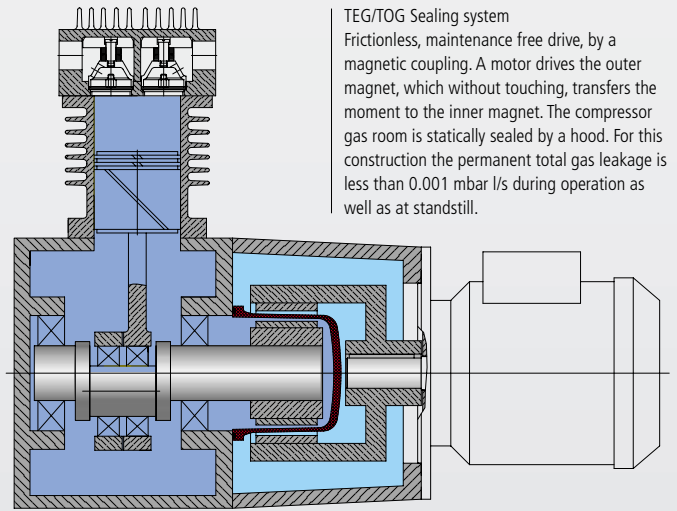
ENVIRONMENTALLY FRIENDLY COMPRESSION OF GASES – A HAUG SPECIALITY

HAUG gas-compressors run absolutely oil-less with dry lubrication. The oil-less compression avoids any contamination of the process gas and the process machinery.

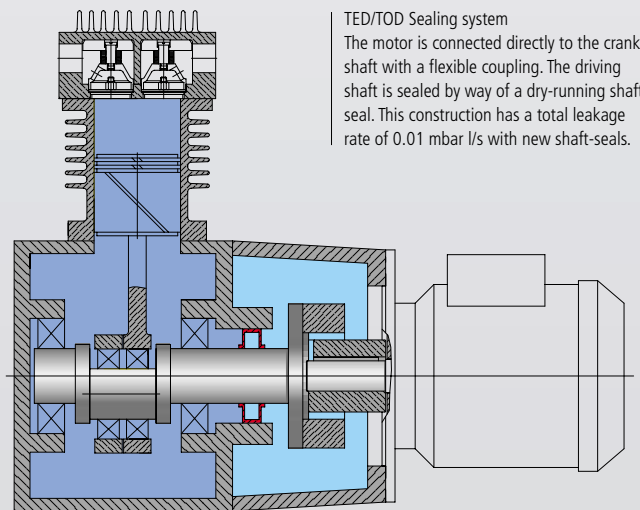
With most processes, contamination of the gases must be avoided. Primary lubricating oils within the compression unit can lead to compatibility problems, and to risks like explosions and chemical reactions.

It is not economical for oil to be filtered after the compressor. For this and other reasons oil-free compression is preferred in process technology.

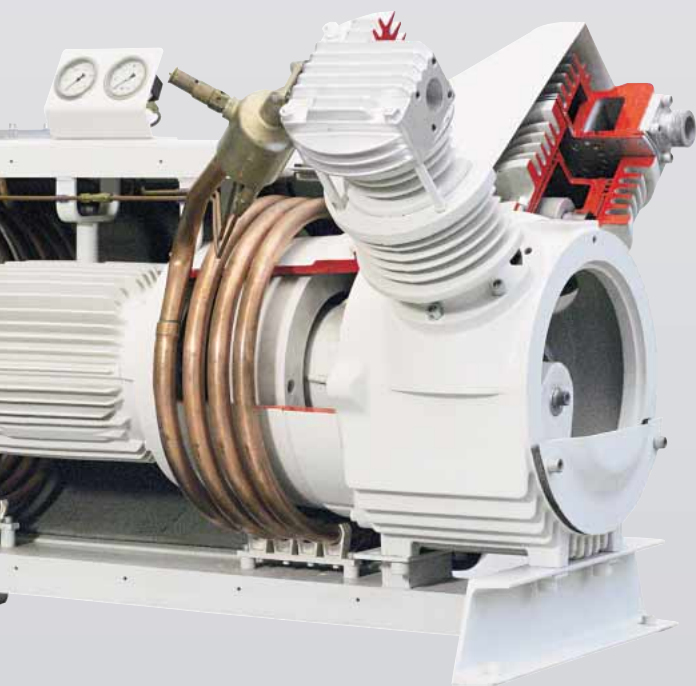
To obtain an absolutely hermetically gas-tight unit, HAUG gas compressors are equipped with a magnetic coupling. For this construction the permanent total gas leakage is less than 0.001 mbar l/s during operation as well as at standstill. In the case of helium at 3 bar pressure the gas loss is merely 5 grams per year! Contamination of the ambient environment through gas leakage with these compressors is practically impossible.

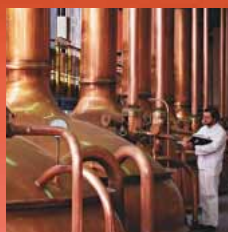
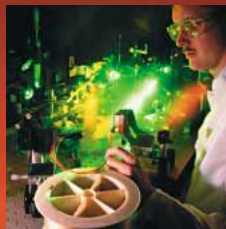


TEG/TOG Sealing system
Frictionless, maintenance free drive, by a magnetic coupling. A motor drives the outer magnet, which without touching, transfers the moment to the inner magnet. The compressor gas room is statically sealed by a hood. For this construction the permanent total gas leakage is less than 0.001 mbar l/s during operation as well as at standstill.



TED/TOD Sealing system
The motor is connected directly to the crankshaft with a flexible coupling. The driving shaft is sealed by way of a dry-running shaft-seal. This construction has a total leakage rate of 0.01 mbar l/s with new shaft-seals.





REFERENCES

GAS COMPRESSORS

Numerous internationally acclaimed enterprises fit HAUG oil-free gas compressors into their systems.

ABB	Power station technology
AGA	Gas producer
AIR LIQUIDE	Gas producer
AXIMA	Plant engineering
BAYER	Chemicals
BOC	Gas producer
BORSODCHEM	Chemicals
BRIDGESTONE	Tyre manufacturer
BTG	Coating
CERN	Research institute
CORRENS	Engineering
CRYOSTAR	Plant engineering
DILO	Gas cleaning
ENERVAC	Gas cleaning
ETH	Research institute
HÜTTLIN	Process engineering
KRUPP UHDE	Plant engineering
LINDE	Gas producer
LONZA	Chemicals
MAN TURBO	Plant engineering
MESSER	Gas producer
PANGAS	Gas producer
PETROBRAS	Petrol industry
ROCHE	Chemicals
SISECAM	Glass industry
SL-GAS	Gas producer
SOLVAY	Chemicals
SULZER	Plant engineering
TECHNIP	Plant engineering
UHDE	Process technology
VA-TECH	Plant engineering

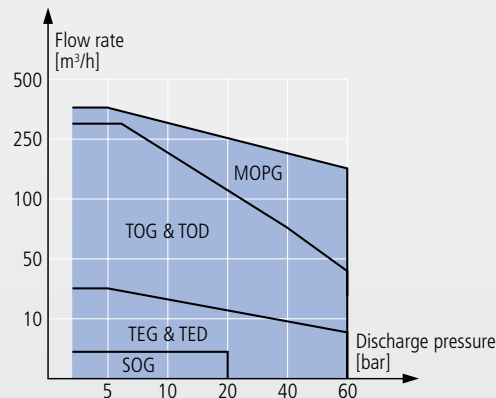
HAUG PISTON-COMPRESSORS FOR OIL-FREE GAS COMPRESSION

In addition to the well known cross-head process-gas compressors, many users are utilising trunk-piston compressors in the lower power range up to 30 kW. The advantage of these types is their compact and simple construction.

With the trunk-piston compressor the compression piston is directly driven by the connecting rod. The cross-head with the piston rod as well as packing boxes are not necessary with this construction.

Similar to electric motors, life long lubricated and sealed roller bearings are utilised to minimise any friction occurring in the crank mechanism. In this way there is no oil in the whole compressor.

With due care and attention, the use of the lowest manufacturing tolerances and high-tech materials, quality compressors for demanding gas compression can be produced, which are not only economical but also highly reliable. Thanks to especially developed bearings with a patented connecting rod system, exchange intervals for the drive bearings are at 10,000 to 20,000 hours under continuous operation, without maintenance and re-lubrication.



Type SOG

- Oil-less, dry-running trunk-piston compressor
- Single stage compression
- Driving power 0.5–1.5 kW
- Suction pressure up to max. 20 bar
- Air cooled
- Direct drive
(statically sealed compressor)
- No Ex-protected execution



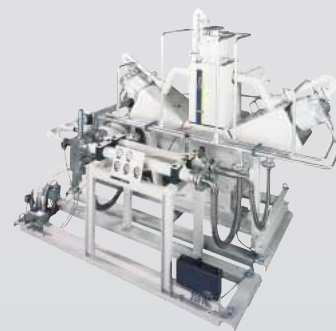
Type TEG and TED

- Oil-less, dry-running trunk-piston compressor
- 1-, 2- or 3-stage compression
- Driving power 2.0–5.5 kW
- Suction pressure up to max. 10 bar
- Air cooled
- Direct drive
- Type TEG: drive with magnetic coupling
(statically sealed compressor)
- Type TED: drive with shaft sealing
- Optional in Ex-protected execution



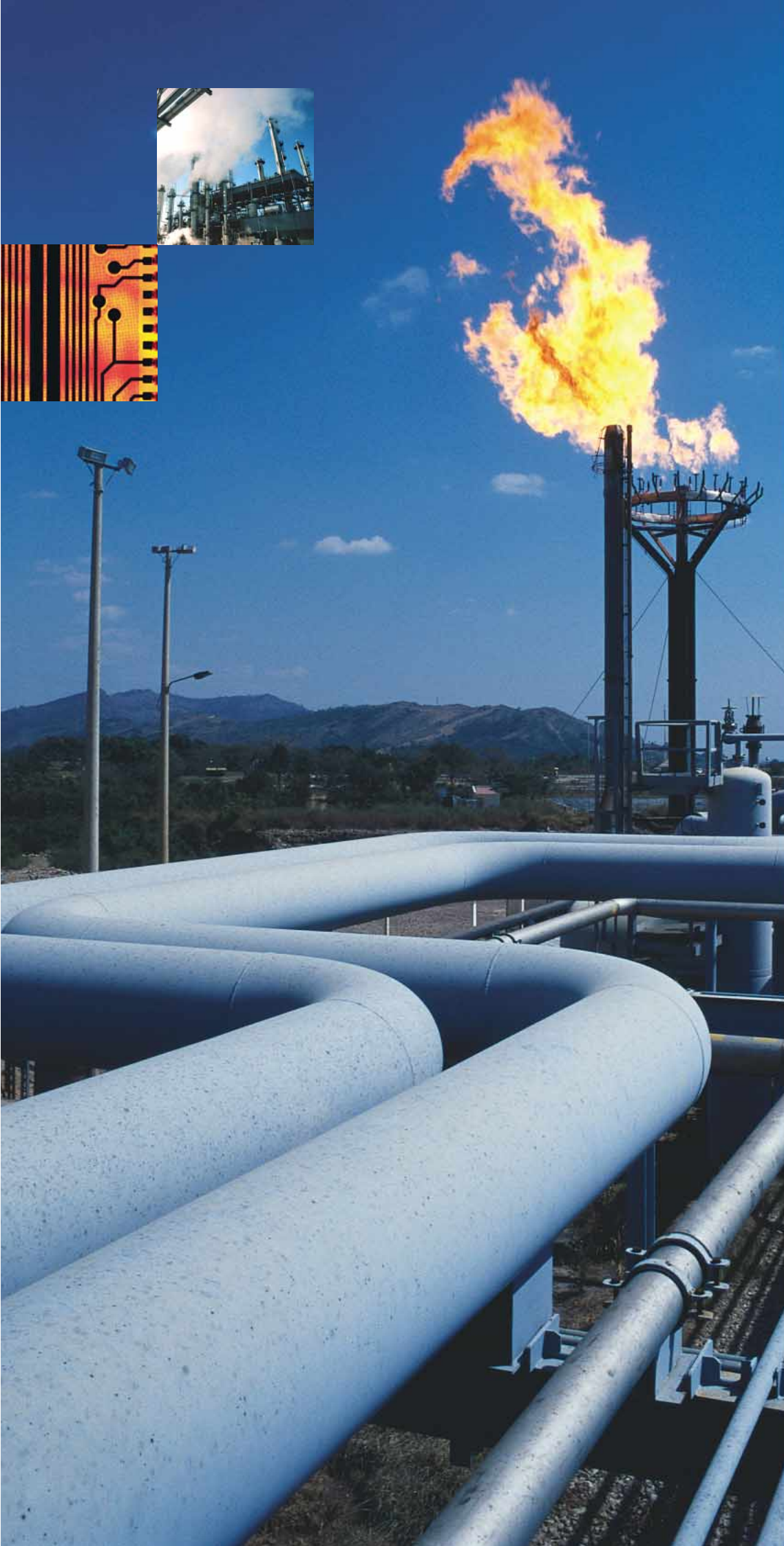
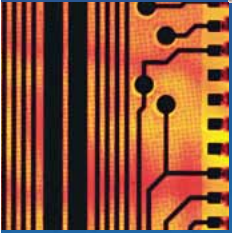
Type TOG and TOD

- Oil-less, dry-running trunk-piston compressor
- 1-, 2- or 3-stage compression
- Driving power 5.5–30 kW
- Suction pressure up to max. 10 bar
- Air- or water cooled
- Direct- or Belt drive
- Type TOG: drive with magnetic coupling
(statically sealed compressor)
- Type TOD: drive with shaft sealing
- Optional in Ex-protected execution



Type MOPG

- Oil-free, dry-running cross-head compressor
- 1-, 2- or 3-stage compression
- Driving power 30–75 kW
- Suction pressure up to max. 16 bar
- Water cooled
- Belt drive
- Sealing of the piston rods with stuffing boxes
- Optional in Ex-protected execution



COST SAVING AND ENVIRONMENTAL PROTECTION: RECOVERY OF GASES

Today gases are successfully utilised in practically every area of industry and process technology use of technical gases significantly increases the productive and quality of many processes.

Where technical gases are used in a process, there may be fumes produced during the process and leakage.

This is why the trend in processes and process technology is towards closed systems with gas recovery.

Numerous practical examples show that the benefits are not just environmental. The saving made by recovery equipment enables pay back in a short time period.

Examples:

- Inert, noble gases like Xenon, Argon or Helium
- SF₆-gas utilised in electric power systems
- Leakage of natural gas from large compression systems
- Pure nitrogen from inert processes
- Carbon dioxide from processes with supercritical CO₂
- Accumulated Leakage gases for example CO, emitted from processes



COMPRESSORS IN PROCESS ENGINEERING

Gas compressors in the petroleum industry:

Natural gas at atmospheric pressure is compressed to 80 bars free of oil in 3 compression stages and stored in caverns. Explosion-proof compressors are designed and documented according to ATEX rules.



Compressor engineering for extreme environmental conditions:

Particularly when climatic and spatial conditions are a problem, Haug customers benefit from the turnkey container systems, which provide the ideal solution in terms of operational reliability and immediate commissioning.



Turnkey container system for the natural gas industry:

gas leaking from large turbo compressors is conducted back into the process through two HAUG compressors. This turnkey system was constructed completely in an air-conditioned standard container.



High pressure gas quenching with helium or nitrogen:

Helium is compressed at high pressure into a high-pressure chamber to quench mechanical components. After the quenching process, the helium is extracted by suction and returned to the necessary working pressure by means of a gas compressor system.



Biogas circulation in digestion towers:

The biogas which arises during the decomposition process in the digestion tower is drawn in by two HAUG compressors and pressed back into the digestion tower through lances, which stimulates the decomposition of the organic substances. The advantage of oil-free piston compressors is that there is no problem in generating backpressure for high digestion towers. Surplus biogas is stored in gas tanks and used to generate electric power.





CUSTOMISED SOLUTIONS:

The Haug compressors are based on a refined modular construction system. This makes it possible to construct individual and low-cost compressors.

The components around the compressor, and the compressor piping with the process measuring and control technology are built to suit the customer's requirements in each case.

The customer therefore receives ready-to-use compressor systems, which have been put together individually to suit his own requirements.



PISTON- AND SCREW COMPRESSORS FOR STANDARD-APPLICATIONS

STENHØJ-COMPRESSORS

Low operational costs thanks to higher quality

STENHØJ has been manufacturing compressors for over 70 years with due care and resolution to quality. A STENHØJ compressor lasts longer but not without reason – the spare parts are available for 15 years.

These compressors are particularly noted for their excellent performance and functional security. Their long life and low operational costs attract many users, who think long term and consequently decide on STENHØJ.

SULLAIR-COMPRESSORS

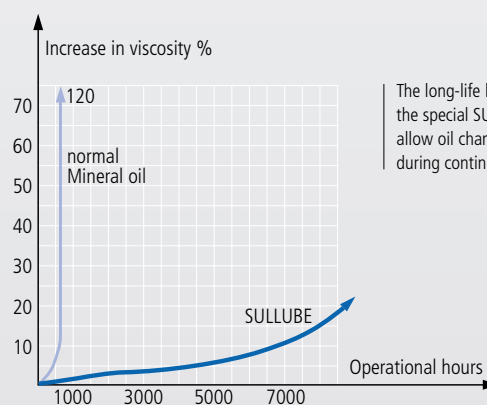
Cost savings through robustness and efficiency

With SULLAIR screw compressors the operator saves energy and lowers the cost for compressed air. SULLAIR apply rotors with ground profiles, by which the losses are small and the compression efficiency high. Moreover the SULLAIR screw compressors work at very low compressor speeds. The result is compressors with a longer life time and higher efficiency.

The SULLAIR screw compressors product line LS and TS are available in the 24 KT versions. This means that there is no longer any oil changing due to the 24KT high performance lubricating agent, as well as a unique 10 year guarantee on the compression air-ends.



SULLAIR-Rotors are finely grounded. They compress at slow revolutions with a high level of efficiency.



The long-life lubricant SULLUBE and the special SULLAIR fibreglass oil filter allow oil change intervals of 8000 hours during continuous operation.



STENHØJ Piston compressors UNIAIR / KA

- 1- or 2- stage compression
- Driving power 3–11 kW
- Working pressure 10 or 15 bar
- Air cooled
- Belt drive
- Option: KA types built on pressure receiver
- Compact UNIAIR Compressors – fit through every door and require little floor space
- Quiet UNIAIR Compressors – can also be installed at the work place



STENHØJ Screw compressor CK / SP

- Driving power 4–55 kW
- Working pressure 8, 10 or 13 bar
- Air cooled
- Belt drive
- Option: CK types built on pressure receiver
- Option: frequency regulation for the SP types



SULLAIR Screw compressor BDS

- Driving power 7.5–75 kW
- Working pressure 8, 10 or 12 bar
- Air cooled
- Belt drive
- Small construction – fits through every door and requires little floor space
- Very quiet - can also be installed at the work place
- Option: frequency regulation for power 55 to 75 kW



SULLAIR Screw compressor LS

- Driving power 75–112 kW
- Working pressure 7, 8, 9.5 or 12 bar
- Air- or water cooled
- Direct drive
- Slow running compression air-ends
- Robust and long lasting machine construction
- Spiral valve for suction volume regulation in partial load operation
- Option: frequency regulation
- Option 24KT-version with 10-year guarantee on the air-end



STENHØJ

SULLAIR

Only available in Switzerland. Other countries on request.



CONNECT YOUR MODEM AND COMMUNICATE WORLDWIDE

The STENHØJ screw compressors CK and SP can be easily connected to a modem. In this way operating data from the compressor can be sent to a distant computer. Through remote maintenance the compressor can be monitored and the operating programme changed.



QUALITY «MADE IN SWITZERLAND»

The term 'demand for quality' has a particular meaning when associated with HAUG compressors.

– Quality demands quality –

The highest quality standards in every respect are guaranteed by our competent, and very experienced staff. Our ISO 9001 certified quality assurance and management system oversees the quality, as well as demands the continual improvement of our products and services.

– Success with satisfied customers –

Our staff have a large know how at their disposal. The application of modern machining equipment and construction facilities enable HAUG to control tight machine tolerances for the benefit of long lasting compressors.

– Solving challenging problems –

We have expert knowledge in anything to do with compressors. Just outline your request and our staff will supply you with advice and action. Anywhere, where compression is characterised by robustness, absolute reliability, and durability is called for, compressors from St. Gallen are successfully utilised world-wide.



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