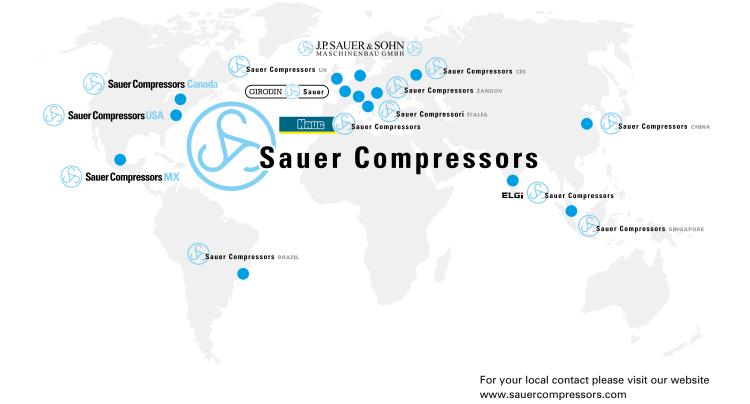




Dependable up to 500 bar - anywhere, anytime, anygas.



### Dependable up to 500 bar – anywhere, anytime, anygas.



## Dependable up to 500 bar – anywhere, anytime, anygas.

#### **Comprehensive industry expertise**

With over 85 years of experience in compressed air technology, we know the challenges our customers are facing all over the world. As a global company we keep local requirements in mind: Our companies and partners around the globe know the particular demands in each area and provide exactly the right solutions and services to meet them. Our support knows neither business hours nor time zones – we are available whenever we are needed.

#### SAUER – High-pressure know-how made in Germany

Our headquarters J.P. Sauer & Sohn in Kiel, Germany, serves as the centre of excellence for our renowned SAUERrange of piston compressors. The oil-lubricated machines are available for pressures up to 500 barg and designed for continuous operation. The reciprocating models allow compression in up to five stages. A total of up to six cylinders are mounted in a star, V or W arrangement. The compressors are the ideal solution for operation at atmospheric suction pressure or to be used as gas-tight boosters with pre-pressures up to 25 barg.

#### Characteristic - World leading oil-free piston compressors

HAUG compressors are the first choice when it comes to demanding applications that require maximum process purity and safety. The dry-running machines are entirely oil-free, prevent contamination and provide hermetic gastightness. The modular and tailor-made design helps to achieve pressures from 1 to 450 barg. High-tech innovations, such as a non-contact magnetic coupling (up to 110 kW) and the high-pressure piston design NanoLoc<sup>®</sup>, add to the compressors' outstanding performance.



### We help to make your process safe and sound.

Sauer compressors have long been a staple of the offshore industry. They are synonymous with maximum reliability and process safety under the toughest conditions. Besides our extensive portfolio of turnkey products, we offer custom solutions specially tailored to the requirements of the offshore industry. Thanks to the HAUG product line these include completely oil-free, dry-running and gas-tight compressors for a wide range of applications, including the legally required recovery of leakage gas.

Whether upstream, midstream or downstream – we provide dependable solutions for offshore applications wherever you need them. Our products comply with all relevant standards, e.g. NORSOK, ABS and DNV and are designed to meet the challenges of 24/7 operation.

"Dependable up to 500 bar – anywhere, anytime, anygas." With industry-leading compressors and accessories in a large variety of power and pressure ranges, we stand by that promise – onshore and offshore, upstream, midstream and downstream.

### Dependable up to 500 bar – anywhere, anytime, anygas.

You name the gas – we provide the solution! Through the comprehensive know-how of renowned product lines like SAUER and HAUG, we are able to meet the requirements of virtually any gas. Even if a particular medium is not listed in the overview, customers are welcome to contact us – if there is no "off-the-shelf"-product to suit their needs, we provide individual custom solutions.

		Э			SAUI	ER							
	HAUG. Pluto	HAUG.Mercure	HAUG.Neptune	HAUG. Sirius	//// Mistral	/////Passat	////Breeze	//// Tornado	//// Hurricane	IIII Orkan	llll Typhoon	//// 5000 series	IIII 6000 series
Air	✓	~	×	✓	✓	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>	✓	<ul> <li>Image: A set of the set of the</li></ul>	✓	✓	✓	✓
CDA (clean dry air)	✓	~	~	~	-	-	-	-	-	-	-	-	-
Nitrogen N <sub>2</sub>	✓	~	~	~	✓	✓	-	×	~	✓	✓	✓	~
Oxygen O <sub>2</sub>	✓	~	~	~	-	-	-	_	_	-	_	_	_
Helium He	✓	~	~	~	✓	~	-	×	~	✓	✓	✓	~
Argon Ar	✓	✓	~	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
Hydrogen H <sub>2</sub>	-	~	~	~	-	-	-	✓	~	~	-	-	✓
Synthesis Gases	-	-	~	~	-	-	-	-	-	-	-	-	-
Natural Gas CH₄	-	~	~	~	-	~	-	✓	~	✓	-	-	✓
SF <sub>6</sub>	✓	$\checkmark$	~	~	-	-	-	_	_	-	_	-	-
Refrigerant gases	✓	~	~	~	-	-	-	-	-	-	-	_	_
Carbon Monoxide CO	-	_	~	~	-	-	-	_	-	-	_	-	-
Carbon Dioxide CO <sub>2</sub>	✓	~	~	~	-	-	_	_	-	-	-	_	-
Gas mixtures	✓	~	~	~	-	-	-	-	-	_	-	_	_

## **Offshore Applications**

### Engine starting air



### Leakage Testing



### **Pipeline purging**



Blowout preventer (BOP) control Riser tensioning system/ Motion compensation for semi-submersible rigs



### Nitrogen generation



### Nitrogen booster



### Legend



 Applications aside from the usual oil & gas processes



- Exploration and production in the oil & gas industry
- Includes everything from the search for potential reserves of oil and gas, exploration of promising sources to the final extraction of the resources



 All means of transportation, storage, support systems and marketing of oil & gas products



Refining and processing of oil & gas products into usable products, such as petrol, diesel oil, jet fuel, fuel oils, liquefied petroleum gas (LPG), propane, natural gas, lubricants, plastics and pharmaceuticals

## **Products – Performance Overview**

Our compressors are as diverse as our customers' requirements. We provide high-quality compressed air and gas solutions in various capacities and pressure ranges to meet the particular demands of a great number of industries and applications.



oil-lubricated, hermetically gas-tight



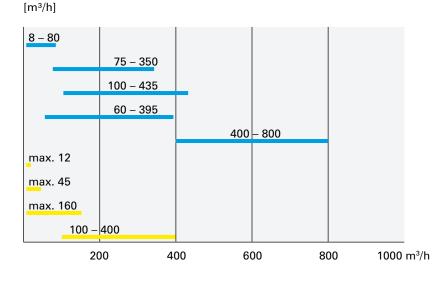
Volume Flow Range

**oil-free**, dry-running and hermetically gas-tight

### Air Compressor Range

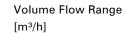
#### Low and Medium Pressure

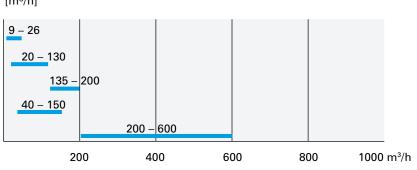
	Final Pressure [barg]	Max. Power [kW]
/////Mistral	10 - 40	3 - 18.5
/////Passat	10 - 80	15 – 55.0
/////Breeze	10 - 40	37 - 90.0
/////Typhoon	10 – 100	15 - 90.0
/////6000 series	10 – 100	132 - 230.0
HAUG.Cygnus	5 - 30	0.37 – 2.2
HAUG.Taurus	5 - 60	4 - 11.0
HAUG.Orion	5 - 60	11 - 30.0
HAUG.Sirius	10 – 100	7.5 – 30.0



#### **High and Highest Pressure**

	Final Pressure [barg]	Max. Power [kW]
/////Tornado	150 – 400	5.5 - 15.0
/////Hurricane	150 – 400	11 - 55.0
///// Orkan	150 – 500	90 - 110.0
/////5000 series	150 – 350	20 - 75.0
/////6000 series	100 – 500	132 – 230.0

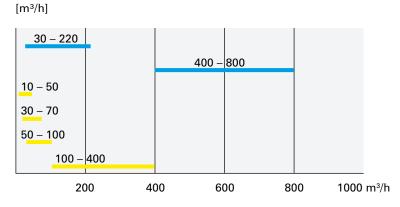




## Air and Nitrogen Booster Range

#### Low and Medium Pressure

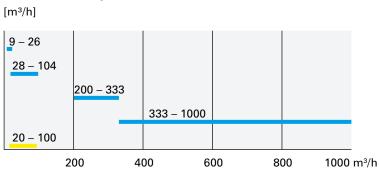
	Inlet Pressure [barg]	Final Pressure [barg]	Max. Power [kW]
/////Mistral	4 - 8	10 - 40	7.5 – 21.5
/////6000 series	4 - 16	10 - 100	132 – 230.0
HAUG.Pluto	max. 20	10 - 60	0.55 – 2.2
HAUG.Mercure	max. 15	10 - 100	3 - 5.5
HAUG.Neptune	max. 13	10 - 100	2.2 – 7.5
HAUG.Sirius	max. 30	10 - 100	7.5 – 30.0



Volume Flow Range

#### **High and Highest Pressure**

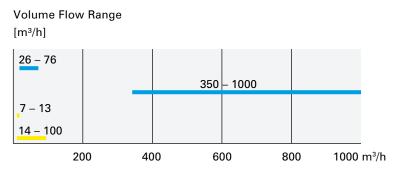
li	nlet Pressure [barg]	Final Pressure [barg]	Max. Power [kW]	Volume Flov [m³/h]	v Range
/////Tornado	3 - 5	150 – 350	5.5 – 8.7	9 – 26	
/////Hurricane	3 - 8	150 – 350	15 – 30.0	<u>28 –</u> 104	
///// Orkan	4 - 7	150 – 350	90 - 110.0		200 – 33
/////6000 series	5 – 10	100 – 350	132 – 230.0		
HAUG.Sirius Nano	Loc max. 30	100 – 450	11 – 30.0	<u>20 –</u> 100	



### Hydrogen Compressor Range

#### **High and Highest Pressure**

In	et Pressure	Final Pressure	Max. Power
	[barg]	[barg]	[kW]
/////Hurricane	0.05-0.2	150 – 350	15 – 38.0
/////6000 series	0.05-20	100 – 350	132 - 230.0
HAUG.Mercure Nano	loc max. 30	100 – 350	4 – 5.5
HAUG.Sirius NanoLo	c max. 30	100 – 450	9 - 30.0

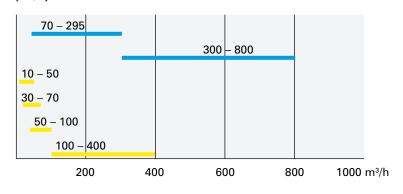


## Helium Compressor Range

#### Low and Medium Pressure

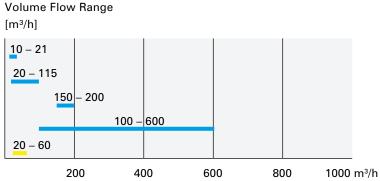
	Inlet Pressure [barg]	Final Pressure [barg]	Max. Power [kW]
/////Passat	0.05	10 - 40	15 – 55.0
/////6000 series	0.05 – 16	10 – 350	132 – 230.0
HAUG.Pluto	max. 20	10 – 50	0.55 – 2.2
HAUG.Mercure	max. 15	10 - 80	3 – 5.5
HAUG.Neptune	max. 13	10 – 100	2.2 – 7.5
HAUG.Sirius	max. 30	10 – 100	7.5 – 30.0

Volume Flow Range [m³/h]



#### **High and Highest Pressure**

	Inlet Pressure [barg]	Final Pressure [barg]	Max. Power [kW]	Volume Flow Range [m³/h]
Tornado	0.05	150 – 230	5.5 - 15.0	10 - 21
/////Hurricane	0.05	150 – 230	11 - 55.0	20 – 115
IIII Orkan	0.05	150 – 350	90 - 110.0	150 – 200
/////6000 series	0.05 – 16	100 – 350	132 – 230.0	
HAUG.Sirius Na	noLoc max. 30	100 – 450	7.5 - 30.0	<mark>20</mark> – 60

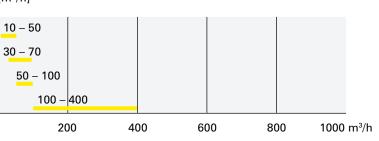


### Oxygen Compressor Range

#### Low and Medium Pressure

	Inlet Pressure [barg]	Final Pressure [barg]	Max. Power [kW]
HAUG.Pluto	max. 20	10 – 30	0.55 – 2.2
HAUG.Mercure	max. 15	10 – 30	3 - 5.5
HAUG.Neptune	max. 13	10 – 30	2.2 – 7.5
HAUG.Sirius	max. 16	10 – 30	7.5 – 30.0

Volume Flow Range [m³/h]



### **CNG Compressor Range**

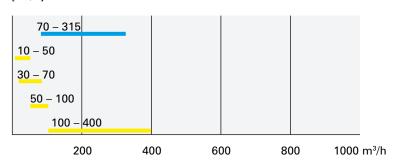
#### Low and Medium Pressure

	Inlet Pressure [barg]	Final Pressure [barg]	Max. Power [kW]
	[5619]	ស្រែងទៀ	[KVV]
<b>   </b> Passat	0.05	10 - 40	15 – 55.0
HAUG.Pluto	max. 20	10 - 60	0.55 – 2.2
HAUG.Mercure	max. 15	10 – 100	3 – 5.5
HAUG.Neptune	max. 13	10 – 100	2.2 – 7.5
HAUG.Sirius	max. 30	10 – 100	7.5 - 30.0

Volume Flow Range [m³/h]

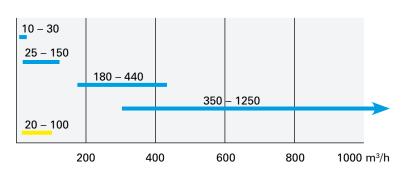
Volume Flow Range

[m<sup>3</sup>/h]



#### **High and Highest Pressure**

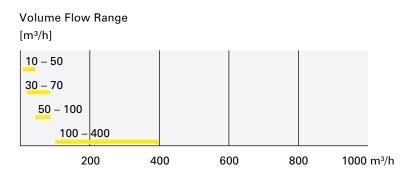
	Inlet Pressure [barg]	Final Pressure [barg]	Max. Power [kW]
/////Tornado	0.05	150 – 350	5.5 – 15.0
/////Hurricane	0.05	150 – 350	11 – 55.0
///// Orkan	1.5 – 7	100 – 350	90 - 110.0
/////6000 series	0.05 – 25	100 – 350	132 – 230.0
HAUG.Sirius Nai	noLoc max. 30	100 – 450	7.5 - 30.0



## "Anygas" Compressor Range

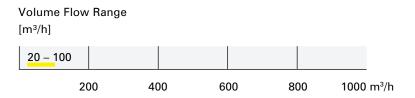
#### Low and Medium Pressure

	Inlet Pressure [barg]	Final Pressure [barg]	Max. Power [kW]
HAUG.Pluto	max. 20	10 – 60	0.55 – 2.2
HAUG.Mercure	max. 15	10 - 100	3 - 5.5
HAUG.Neptune	max. 13	10 - 100	2.2 – 7.5
HAUG.Sirius	max. 30	10 - 100	7.5 - 30.0



#### **High and Highest Pressure**

Inlet Pressure	Final Pressure	Max. Power
[barg]	[barg]	[kW]
HAUG.Sirius NanoLoc max. 30	100 – 450	7.5 – 30.0





## **Seismic Exploration**

Seismic air guns are used to find oil and gas underneath the seabed. Towed behind a vessel, air guns are mechanical devices with metal flaps that release high pressure air underwater. The air bubbles expand, generating seismic waves that reach the seabed. The reflections from these waves are received by a 'streamer' which then provides detailed information about the structure of the seabed and possible oil and gas fields.

### Application(s)

Supplying high pressure air for the air gun

### Customers

- Seismic operators
- Research industries
- Shipyards
- Packagers

## Suitable products SAUER

Series	Volume flow	Pressure range	Medium
Hurricane       5000 series       6000 series	<b>120−720 m³/h</b> 2−12 m³/min 70−420 scfm	<b>120–207</b> barg 1,700–3,000 psig	Air

### **Customised Solutions**

### 20' Offshore Container for Seismic Exploration

#### 6000 series – WP 6442 Basic

- Mobile solution for different research vessels
- Certified according to DNV 2.7-1

#### **Technical Data**

Volume flow: 600 m<sup>3</sup>/h | 10 m<sup>3</sup>/min | 350 scfm Max. pressure: 207 barg | 3,000 psig





//// 6000 series WP 6442 Basic 720 m<sup>3</sup>/h @ 207 barg



## **Motion Compensation for Semi-submersible Rigs**

Deep water drilling requires a rigid connection between the platform/drill-ship and the seabed. In order to keep on drilling in rough weather conditions, the movement of the derrick on the platform needs to be compensated. This compensation is done by wire-line or direct tensioning systems based on hydraulic systems and in order to keep the hydraulic pressure stable in the system, high pressure air or gas is used.

### Application(s)

 Supplying an air or gas cushion on top of the hydraulic liquid

### Customers

- OEM companies
- Drilling operators
- Shipyards
- Packagers

## Suitable products SAUER

Series	Volume flow	Pressure range	Medium
/////Hurricane /////5000 series	<b>140 m³/h</b> 2.3 m³/min 82 scfm	<b>207 – 315 barg</b> 3,000 – 4,600 psig	Air or Nitrogen

### **Customised Solutions**

### WP 5000 Offshore Module for Motion Compensation

#### 5000 series - WP 5000 Basic

- Integrated adsorption dryer
- Compliant with NORSOK, DNV Offshore and ABS CDS 2011 Cat. 01
- Installed at over 100 offshore platforms already

#### **Technical Data**

Volume flow: 140 m<sup>3</sup>/h | 2.3 m<sup>3</sup>/min | 83 scfm Max. pressure: 350 barg | 5,000 psig



///// 5000 series

WP 5000 Offshore module incl. adsorption dryer



# 🚯 🐣 📳 High-Pressure Nitrogen Boosting

Many applications in the oil & gas world require nitrogen, which is mostly used for blanketing in order to prevent an explosive atmosphere. Sauer offers a wide range of boosters for such applications. The nitrogen is produced by membranes or PSA systems and Sauer compressors are used to store the gas at a higher pressure.

### Application(s)

Boosting nitrogen to a higher pressure level

### Customers

- OEM companies
- Shipping companies
- Drilling companies
- Packagers



## Suitable products

### SAUER

Series	Volume flow	Pressure range	Medium
Mistral       Tornado       Hurricane       Orkan       6000 series	<b>10–1,000 m³/h</b> 5–735 scfm	<b>20 – 350 barg</b> 290–5,000 psig	Nitrogen

#### Chur

Series	Volume flow	Pressure range	Medium
HAUG.Mercure HAUG.Neptune HAUG.Sirius	<b>10–300 m³/h</b> 5–175 scfm	<b>10 – 40 barg</b> 145–580 psig	Nitrogen

## Anywhere, anytime, anygas - anything else?

In addition to high-quality compressors, control systems, accessories and services, Sauer Compressors customers benefit from:

### **Engineering assistance**

Through our local representations we can assist engineering teams locally and offer support with regard to integrating our products. In this way, we ensure our customers make the most of their installation.

### **Documentation – Integrated Logistics Support (ILS)**

High-value products and solutions require high-quality documentation. This includes the whole range of Integrated Logistics Support (ILS).

#### Factory acceptance tests and third-party inspection

For Sauer Compressors, quality is not a promise – it's a fact! All our compressors are subjected to a 12-hour endurance test at final pressure and issued a high level 3.1 inspection certificate after the final inspection. Upon request, third-party inspections can be performed. For our helium compressors, we have devised an extensive 16-hour test procedure that is unprecedented in the industry. Both static and dynamic leak rates are tested with the noble gas itself. As a result, operators benefit from 'true' helium compressors providing unparalleled leak tightness.

### Installation and commissioning

Even the best product's performance will suffer if the installation is faulty. Upon request, our expertly trained service technicians will set up the newly acquired Sauer product and integrate it into established systems at our customer's facility. Thanks to our local representations, this service is available anywhere in the world. After the initial setup, the installation is thoroughly tested and finally commissioned. To ensure maximum performance, low operating costs and a long service life, we offer in-house trainings for the operating staff.







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