

OPC

OIL FREE PISTON COMPRESSORS THE SUSTAINABLE AIR-COMPRESSOR



WWW.AFCOMPRESSORS.COM



INNOVATION AND TRADITION

in compressed air industry
since 1870



2



“The leading company of high quality compressed air systems”

AF compressors is the global leader in supplying high quality, oil free piston compressors for the PET blow molding market. Along with our main factory and headquarters in Belgium, we have world class production centers in Pune, India and Kunshan, China to support these thriving markets.



Global leader

Annual production: 400+ units.

Production HQ: Liège Belgium, production centers in Pune India & Kunshan in China.



R&D: Innovation Management

Unique laboratory for research and development at the University of Louvain-La-Neuve.

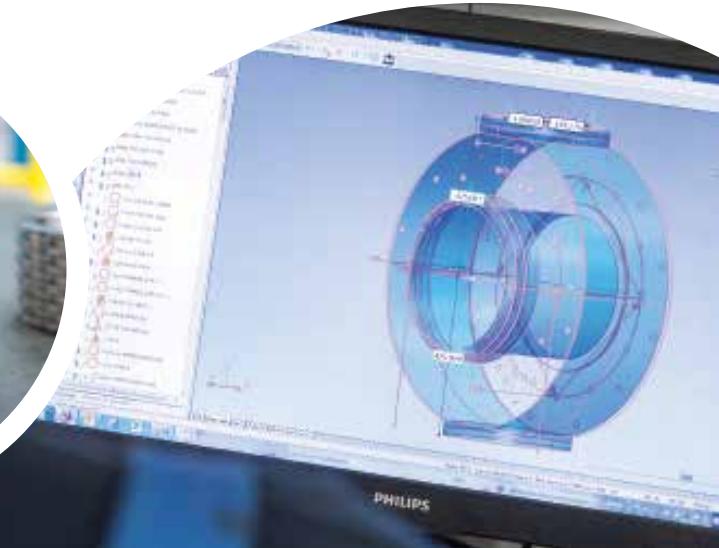
State of the art test bench to confirm air capacity to ISO 5167-2003 and ISO 1217-2009 standards.



Aftermarket support

15 subsidiaries + distribution centers + spare part shops + agencies

AF Academy & training centers + 150 specialized technicians.



History & innovation since 1870

AF's experience and legacy has provided a solid foundation for our company to become the leading supplier of high quality compressed air systems for the PET Bottling industry. Today AF has over 6500+ compressor installations in over 175 countries in the world. AF has diversified its product portfolio in response to existing customer demand, providing 8-10 bar oil free air to many beverage plants. This technology is also successful in the food industry, but also in specific industrial application, steel, chemical industry, petrol and gas industry...

AF compressors are sustainable for decades, lowering the CO₂ carbon footprint.

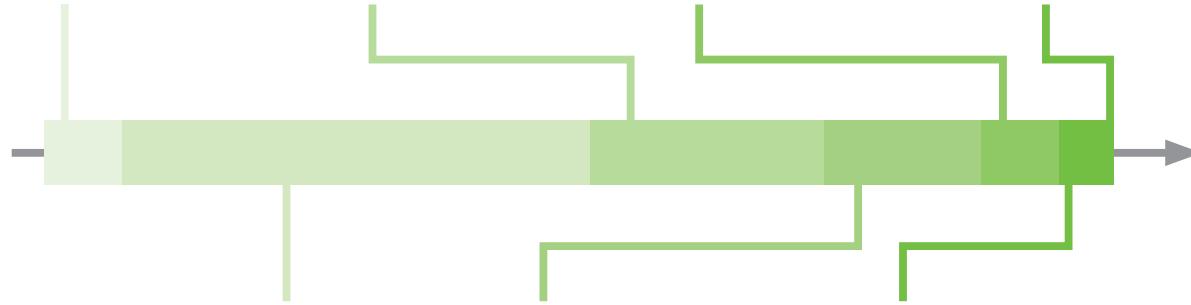
1870

AF, a privately owned company was formed in Liège, Belgium to produce pneumatic hammers for the mining industry.



1960

Oil free reciprocating compressors with PTFE piston rings were developed and successfully used in the brewing, chemical, and food industries.



1900 - 1950

AF manufactures reciprocating compressors for the coal and steel industries.



1980

AF begins manufacturing oil free PET compressors to penetrate the emerging PET bottle market.



2000

AF becomes the leading supplier and specialist for the high pressure oil free compressor PET market.

TODAY

AF is the leading manufacturer of oil free piston compressors with 60% share of the PET compressor market, while the newly redesigned 8 bar and 10 bar compressors are also offering improved efficiency for any industrial applications.



A COMPLETE RANGE OF CAPACITIES

6-15 bar units & 20-40 bar units.

OPC RANGE

6-15 BAR 2 STAGE OIL FREE PISTON COMPRESSORS

See our OPC Range brochure to discover the detailed range of capacities for 6-15 bar OPC compressors.



OPC 45-75 / 8 & 10 bar

Nominal capacity from **7,2 to 12,8 m³/min** FAD (272 to 452 CFM), motor power from **45 to 75 kW**
Motor service factor 1.0, capacities ISO 1217.



OPC 90-132 / 8 & 10 bar

Nominal capacity from **15 to 23 m³/min** FAD (530 to 812 CFM), motor power from **90 to 132 kW**
Motor service factor 1.0, capacities ISO 1217.

6-15 bar: 7,2 ▶ 58 m³/min



OPC 160-200 / 8 & 10 bar

Nominal capacity from **24,2 to 32,1 m³/min** FAD (855 to 1134 CFM), motor power from **160 to 200 kW**
Motor service factor 1.0, capacities ISO 1217.



OPC 250-355 / 8 & 10 bar

Nominal capacity from **38,5 to 58 m³/min** FAD (1360 to 2048 CFM), motor power from **250 to 355 kW**
Motor service factor 1.0, capacities ISO 1217.



OPC 160-220 / 3,6-4 bar

Nominal capacity from **39,8 to 46,5 m³/min** FAD (1407 to 1642 CFM), motor power from **160 to 220 kW**
Motor service factor 1.0, capacities ISO 1217.

Single stage 3,6-4 bar
& 2 stages 16 bar unit



OPC M3 16 bar

Nominal capacity from **2,8 m³/min** FAD (100 CFM), motor power from **30 kW**
Motor service factor 1.0, capacities ISO 1217.



**3 STAGE
OIL FREE PISTON
PET COMPRESSORS**

See our PET brochure to discover the detailed range of products for 20-40 bar PET compressors.



M2, L3 series to L5 series

Nominal capacity from **150 to 1680 m³/h** FAD (88 to 989 CFM), motor power from **30 to 280 kW**
Motor service factor 1.0, capacities ISO 1217.

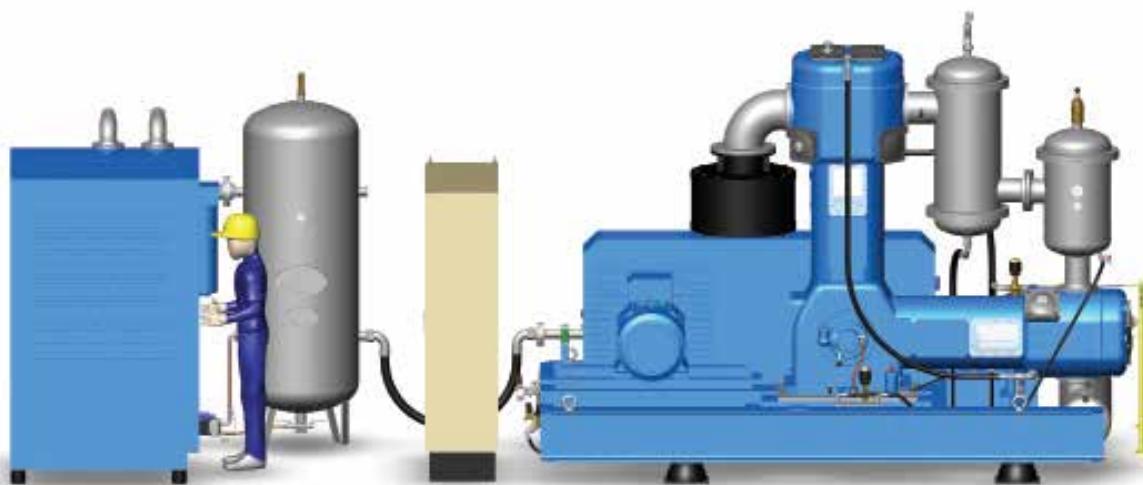
**20-40 bar:
150 ▶ 3300 m³/h**



L6 to L9 series

Nominal capacity from **1760 to 3300 m³/h** FAD (1036 to 1942 CFM), motor power from **280 to 550 kW**
Motor service factor 1.0, capacities ISO 1217.

TURNKEY SOLUTIONS



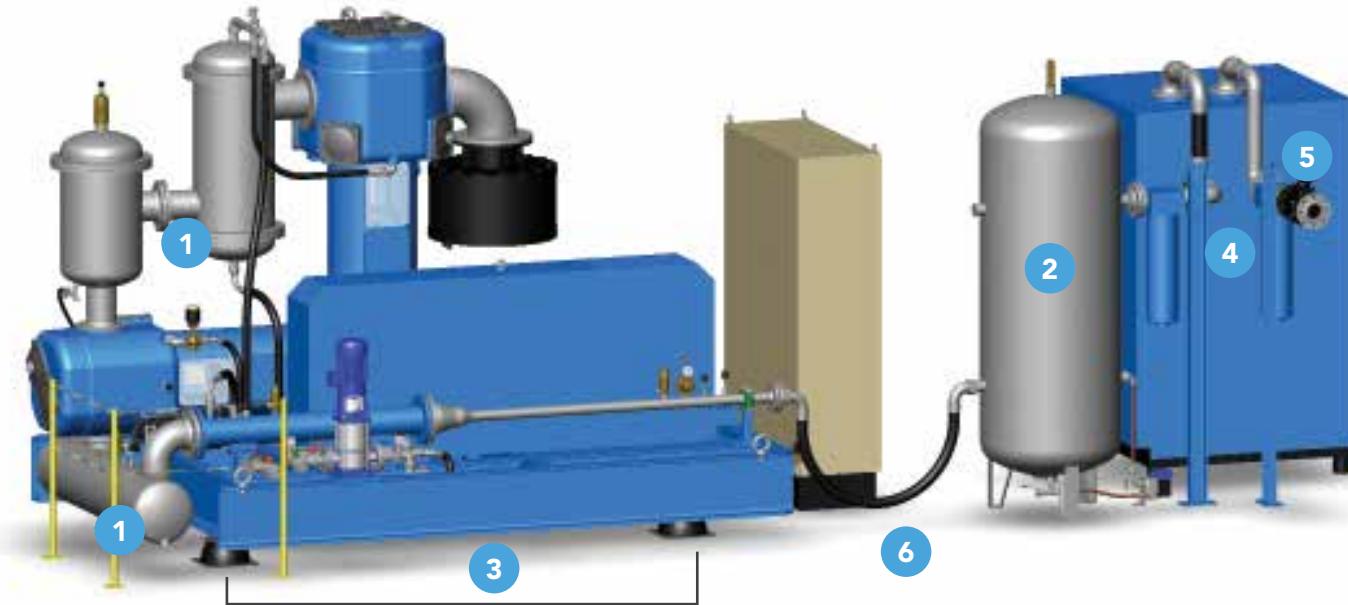
EASY INSTALL AND OPERATE



Turnkey package:

- Air receivers.
- Adsorption & refrigerative air dryer.
- All filtration level available.
- Separate cooling systems.
- Protection for any site conditions.
- Electrical Options, CE or UL Approval.
- CE-PED, ASME, SEL0... any certification available.





TURNKEY SOLUTIONS FOR ANY APPLICATION



1 Interconnecting pipework, 2 Separators + air Receiver

Hot galvanising, nickel plating.
Package equipped with Bekomat drain system.

3 Anti-Vibration Mounts

Skid mounted on anti-vibration mounts.
No specific foundation.

4 Air Filtration

Pre-filter, dust filter, optional submicronic filtration,
0,01µ activated carbon with odour removal.

5 Air Dryer

- Refrigerative dryers. Stainless steel condenser, air or water-cooled condenser, automatic draining system. Dew point down to +3°C.
- Heatless regeneration adsorption dryers. Average compressed air consumption of 15-20%. Dew point down to - 40°C, or even - 70°C.
- Heating regeneration adsorption dryers with purge cooling. Average compressed air consumption of 2-3 %. Dew point down to - 40°C.

6 Pneumatic connections

The piping between the compressor, air receiver and the dryer flanges, supports, safety warrant and mounting accessories, shut off gates /stop valves are optional.

2 STAGE OIL FREE PISTON COMPRESSORS



“ Lowest maintenance costs.
Lowest energy costs.

Fewest moving parts. Lowest speed.



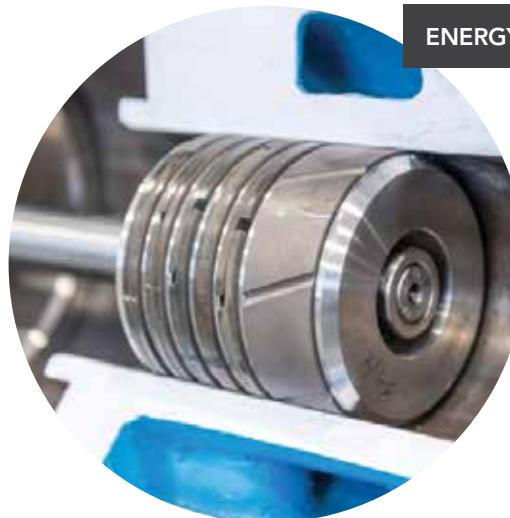
SIMPLE & EFFICIENT DESIGN



LOW ENERGY CONSUMPTION



LOW MAINTENANCE COSTS



ENERGY, PERFORMANCE AND OPERATING COSTS : PISTON IS STILL THE BEST !

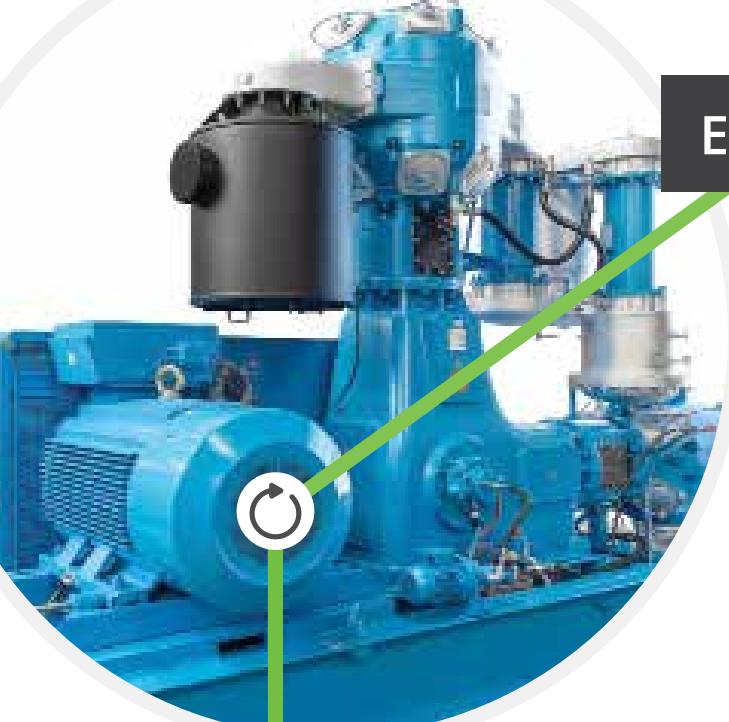
Features

- Simplistic design as the '40bar AF compressor', 2 stage, oil free, Robustness, long-lasting efficiency.
- Slow speed, fewer parts, less wear, long lasting and reliable technology.

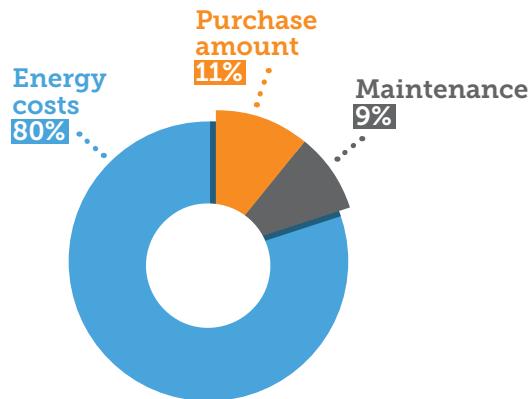
Benefits

BEST ENERGY Efficiency vs. SCREW AND CENTRIFUGAL UNITS !

- Direct money savings. Low costs for maintenance, Lower. energy Consumption short and long term pay back.
- EASY and SIMPLE Mechanics to Maintain.
- Rapid Return on Investment.
- Long lasting performance and low cost use compared to other systems.



High efficiency



Total life cycle of an oil free piston compressor calculated on a 10 year operation.

Electrical Motor / Service factor 1.0



The electrical motor nameplate shows a service factor (SF).

This motor SF is the percentage of overloading the motor can handle for short periods when operating normally within the correct voltage tolerances.

AF motors always use a service factor of 1.0 hence only consuming the indicated nominal power.



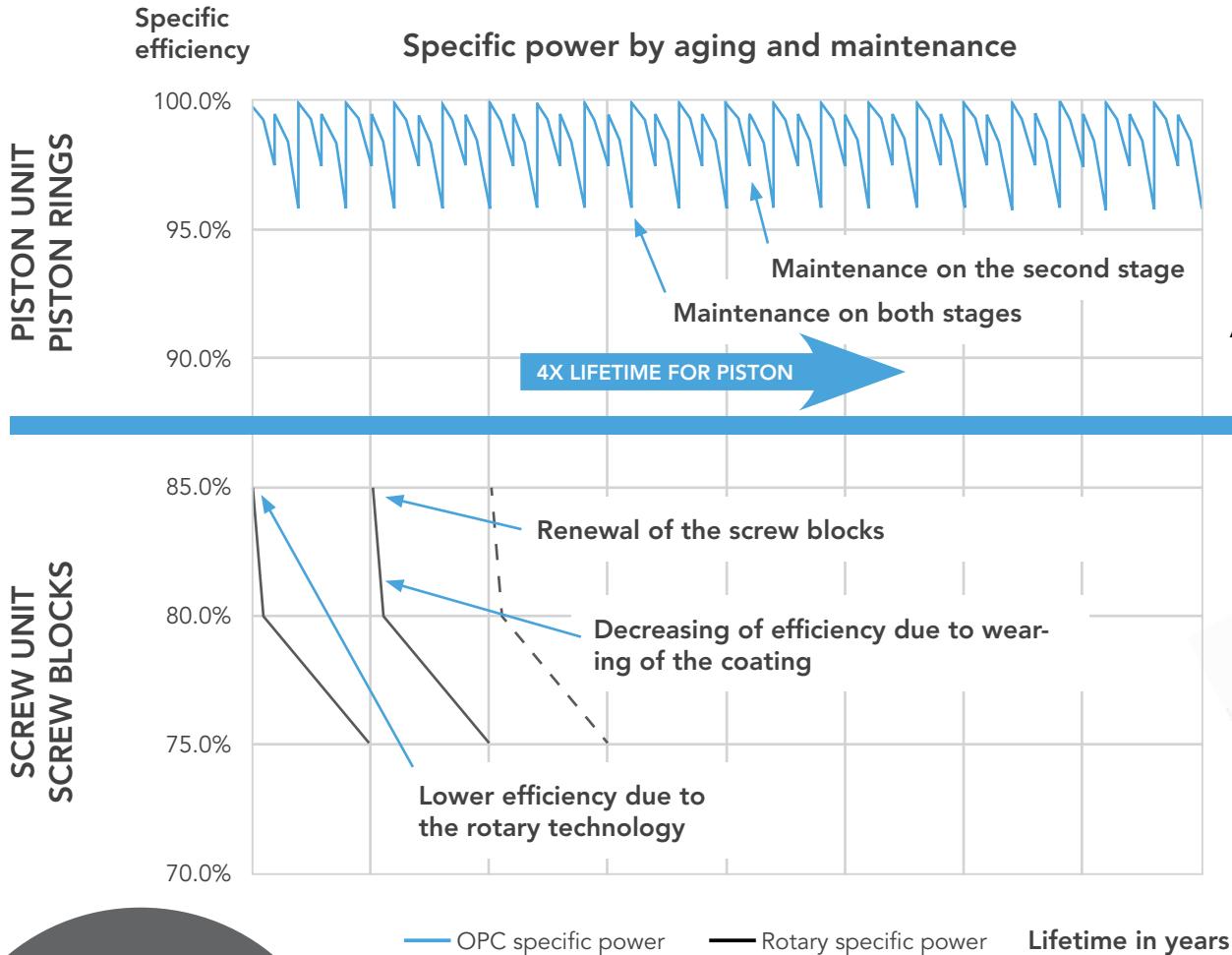
SF 1.00 :
 $P = 200 \text{ kW} \times 1.0 = 200 \text{ kW}$



$$SF\ 1.15 : \\ P = 200\ kW \times 1.15 = 230\ kW$$

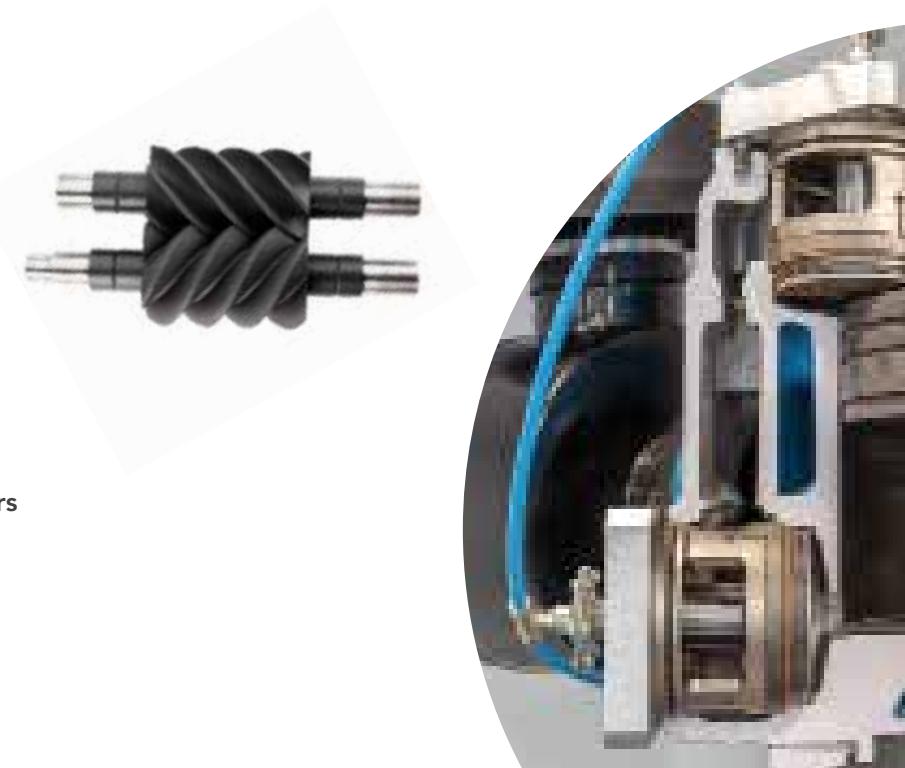
AC Induction Motor			
HIGH EFFICIENT			
ORD. NO.	1LA0261SE41	SIZE	6
TYPE	4P60SD	FRAME	286T
H.P.	30.0	ERVICE FACTOR	1.15
AMPS.	35.0	VOLTS	460
R.P.M.	1765	HZ	60
DUTY CYCLE	CONT. 10 C. AMPS.	DUTY CYCLE	
CLASS	F	TEMP. CLASS	B
INSUL.	150	CODE	G
SH. END	SH. END	NO. H.P. END	93.0
B.R.G.	SHR0030K3	B.R.G.	500CB3-3-BP3

Long lifetime - Long performances



Average difference 20 %

AF OPC Piston compressor:
8000 hours and 16000 hours are respectively the maintenance intervals for the two stages of the piston compressor, when duly maintained the machine keeps performing like new with a guaranteed long lifetime and supreme reliability.

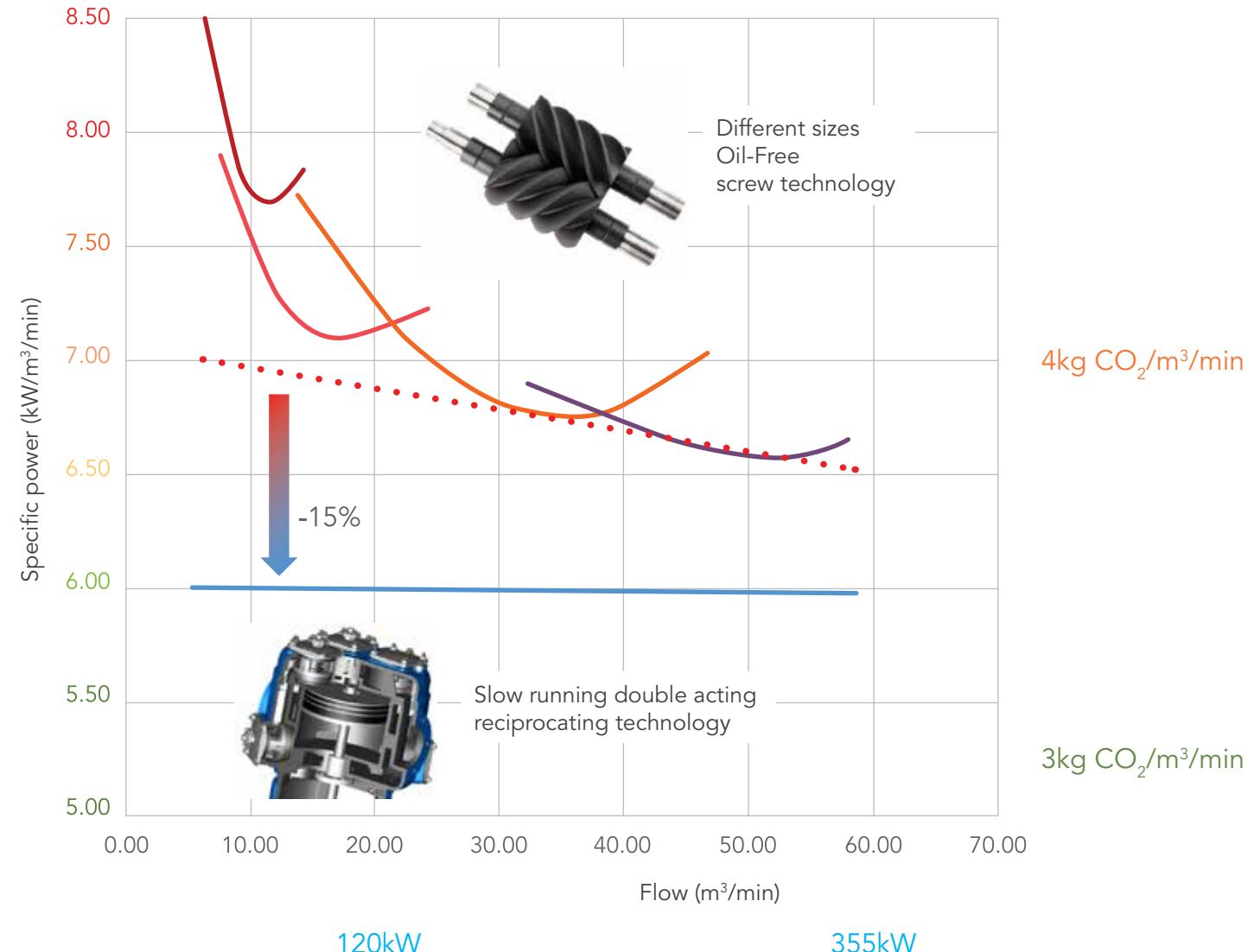


Performance using Oil-Free technology



Energy is about 80% of the Total Cost of Ownership.

Compressors express their efficiency in kW/m³/min or the amount of kW needed to compress 1 m³/min of air.



AVAILABLE OPTIONS

for any site conditions



SEPARATE COOLING SYSTEMS

Evaporative closed circuit cooling towers

For temperatures above 36°C.

Cooling capacities are selected to suit the local site wet bulb temperature, up to 30°C (Wet Bulb) to provide the most efficient cooling system. The tower and the water pump are controlled by the compressor's electrical cabinet.

Option: two speed fan motor for winter and summer, antifreeze protections, heat tracing.

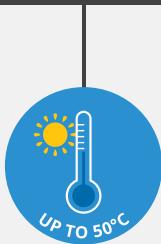


The water pump

is mounted on the compressor's base plate.



Optimal operating in hot and tropical areas



Due to the heavy duty structure and high efficiency cooling system, our compressors operate up to ambient temperatures of **50°C**.

Expensive **chilled water is not needed**, even in the Middle-East conditions.

Fan cooler or cooling tower water losses are much lower than other compression systems.



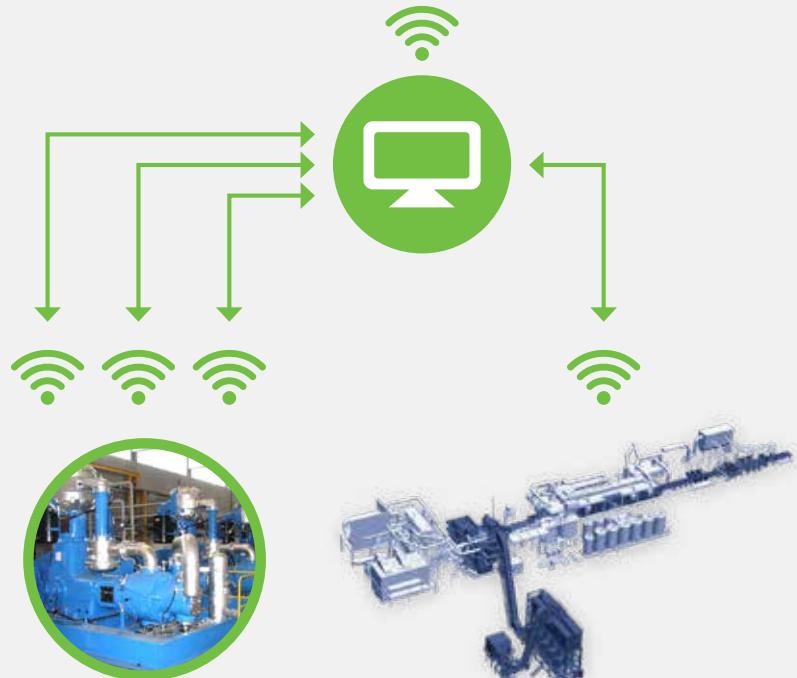
AF Compressors in
Hana Water factory,
Al Qassim,
Saudi Arabia.

Industry 4.0



Optimized control between the compressors and compressed air users to reduce:

- Energy consumption
- Pressure fluctuation
- Service cost



ENERGY & COST SAVINGS



REGULATION



SIS: SMART INVERTER STARTER
AFS: ADJUSTABLE AIR FLOW SYSTEM
FREQUENCY INVERTER Full Size Pack

RECOVERY



HRS90: HEAT RECOVERY SYSTEM • 90°C
HRS40: HEAT RECOVERY SYSTEM • 40°C

CONTROLLING



MULTI-COMPRESSOR CONTROLLER
MONITORING & MANAGEMENT

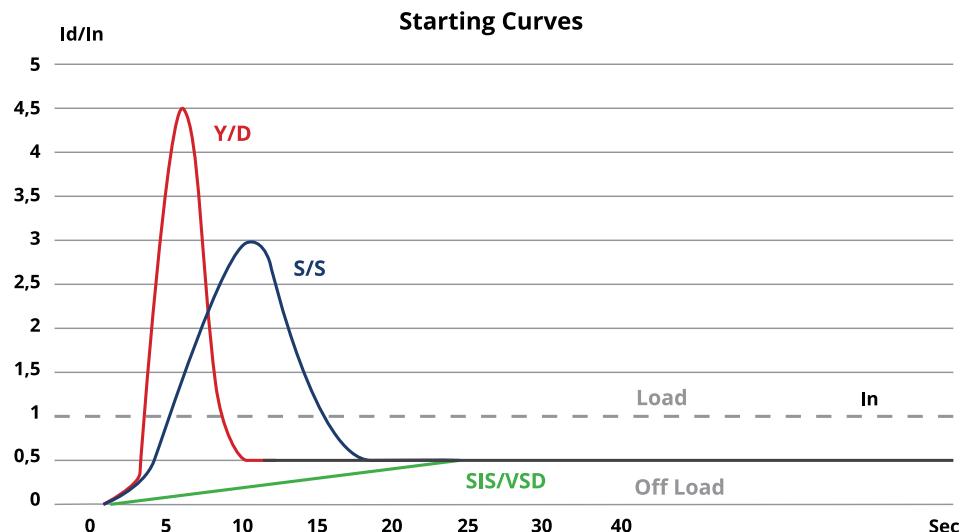




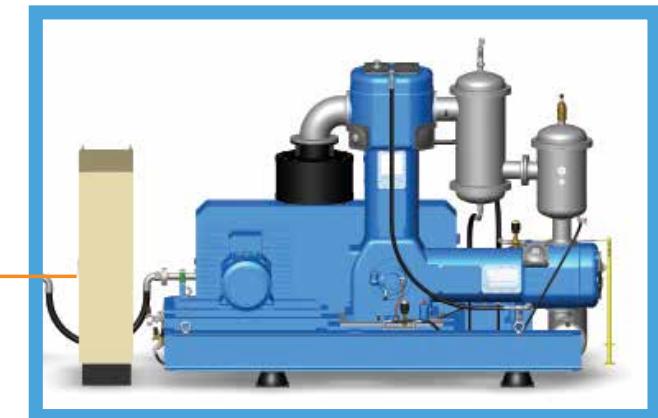
SIS: Smart Inverter Starter

STARTING CURRENT **FAR BELOW** NOMINAL CURRENT

SPECIFIC FREQUENCY INVERTER ELECTRICAL CABINET
FOR STARTING PURPOSE.



- ▶ Starting current even lower vs. regular VSD.
- ▶ Starts faster than VSD.
- ▶ Full load power never exceeds 100 %.



- Standard electric motor...
- Electrical pre-lubrication pump.
- No shielded cabling... or other protection device required.
- No LHF, Line Harmonic Filters required.



AFS: Adjustable Air Flow System

HOW DOES IT WORK?

For 100% air capacity

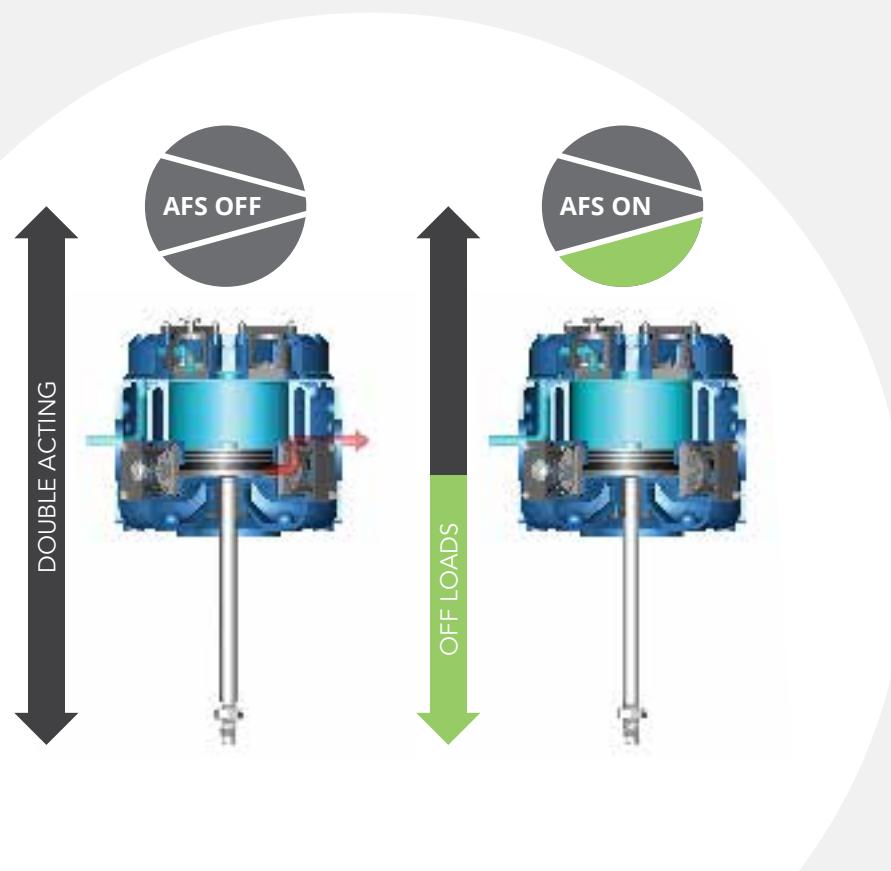
1st stage double acting cylinder compresses the air on the up and down stroke of the piston. This raises the atmospheric air to 4 to 5 bar achieving the most important pressure ratio.

At full load 1st stage double acting cylinder produces 100% of rated capacity to provide 100% air.

For 55% air capacity

1st stage cylinder compresses atmospheric air only on the upward stroke of the piston.

AFS automatically unloads the lower part of the cylinder to match air flow required in the system.



FREQUENCY INVERTER Full Size Package

DECREASING THE **SPEED** ▶ INCREASING THE **SAVINGS**

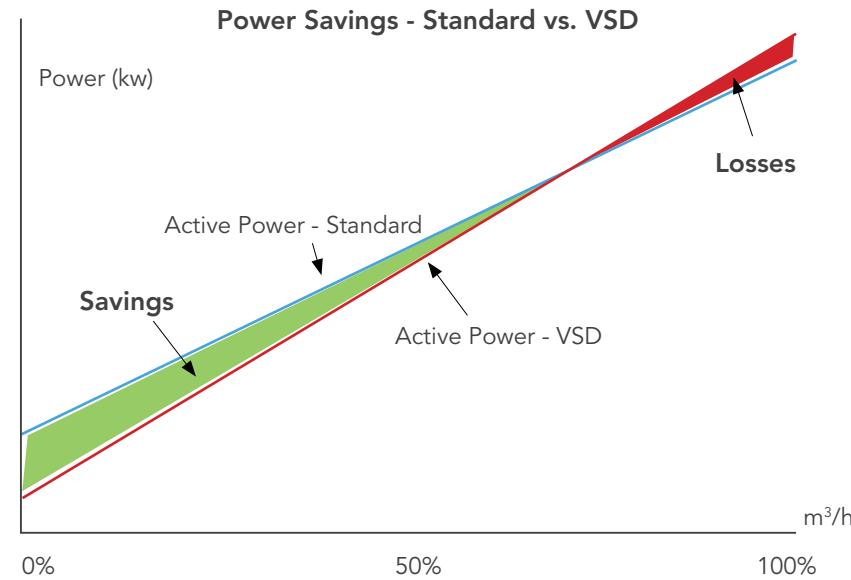
Following to your bottling production profile:
increasing efficiency + decreasing power consumption.

Speed adaptation via frequency inverter.

- **frequency inverter electrical cabinet.**
- **specific motor.** Isolated bearings...
- electrical **pre-lubrication pump.**
- shielded cabling... other protection device.
- LHF, Line Harmonic Filters.

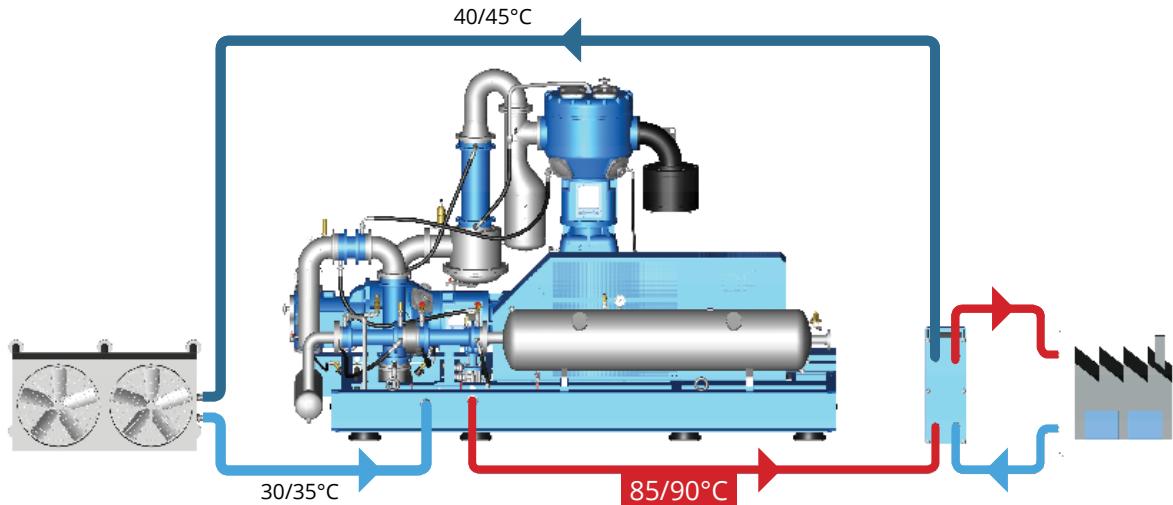
Variable speed

- Starting current of max 1,2 times nominal.
- Power factor ($\cos \varphi$) between 0,95 and 1,0.
- Smooth start-up - no stress on the belts.
- Reduces off-load times.
- Potential energy savings if air demand is fluctuating and especially during low demand.





HEAT RECOVERY SYSTEM 90°C & 40°C



Features & benefits

Features based on OPC 200-8 model / 200 kW.

- Temperature ▶ 30-35°C water in - between 85-90°C water out.
- Power ▶ heat recovered @ 8 bar set pressure on is ca 160 kW = ca 80% of shaft power.
- Water ▶ available quantity of water for heat recovery is ca 2 m³/h water flow for OPC 200 model.
- Thanks to HR, a smaller separate cooling system is used for the complete compressor system.

One year operation, 6000 running hours @ 0.05 € / kW heat = 48,000 € savings.

Heat Recovery System 40°C including:

External skid Heat Recovery System 40°C with stainless steel plate exchanger.



MULTI-COMPRESSOR CONTROLLER Monitoring & management

Automatic selection of the exact compressor(s) to match the specific blowing air requirement.

- Reduces off-load times.
- Smaller power consumption bands.
- Selects the most suitable unit to meet fluctuating air demands.
- Balanced running hours and maintenance.

Siemens Delta S8 and S12

- Communication with any PLC.
- Works with any energy saving device.
- Data visualisation / each compressor.
- Acquisition system.

— 100% responsive —





PROTECTION OPTIONS FOR HOT AND COLD ENVIRONMENTS

Protection for hot temperatures

Oil cooler for ambient temperatures exceeding 40°C.

Water-cooled condenser for refrigerated air dryer for ambient temperatures above 40°C.

Air conditioning for electrical cabinets for ambient temperatures above 40°C.

Protection for cold temperatures

Oil warming for inside temperatures between 1 and 5°C.



ELECTRICAL OPTIONS

AF standard electric motors = 1.0 service factor.

Motors can be selected for your specific application and conditions:

- Motor protection degrees from IP-23 to IP-55 for hot and dusty environments.
- Efficiency class available from IE1, IE2, and IE3.
- Internal heaters to prevent condensate under tropical conditions.
- A variety of voltages and frequencies are available from our standard panels: 400V/3/50 Hz or 440-480V/3/60 Hz...

Other voltages include 380V/3/50 Hz or 60 Hz, 575V/3/60 Hz...

In lieu of the standard star delta starter, we can offer:

- Soft Starter.
- Smart Inverter Starter (see page 15).
- Fully Packaged Frequency Inverter (see page 16).



CERTIFICATIONS & EQUIPMENT OPTIONS

Air receiver options

All codes and certifications are available: CE-PED, ASME VIII, TR CU suiting to Russia, CRN for Canada, SEL0 code for China, NR13 for Brazil, etc.

Additional air receivers

Additional high pressure air receivers are available from 1,000 to 10,000 liters, hot galvanised with accessories including safety valve and Bekomat drain system.

Additional receivers are shipped loose for remote mounting.

Submicronic and activated carbon filtration

Activated carbon filter.

Filters provide submicronic particle filtration down to 0.01 micron and odor removal.

Filters are located at the outlet of the air dryer with AF supplied counter flange.

Miscellaneous

Condensate drain collector, non-return valves, pressure reducers, etc.

Long lifetime



110k W OPC running at 6,5 bar
since 1972



OPC CE68 running at 12 bar
since 1983 in Egypt desert



355 kW OPC running
at 13 bar since 1987

THE MOST EFFECTIVE SERVICE NETWORK IN THE WORLD FOR OIL FREE RECIPROCATING AIR COMPRESSORS

AF's Aftermarket & Service team actively assists you in the maintenance and optimization of your compressor to ensure decades of high performance and trouble free operation. All parts and components available for immediate dispatch: 100% availability of your compressed air installation is our main and daily objective!



► IN EXCESS OF 6500 UNITS
IN OVER 175 COUNTRIES

GLOBAL SERVICE: COMPLETE NETWORK

3 Production sites: Liège - Belgium / Kunshan - China / Pune - India.

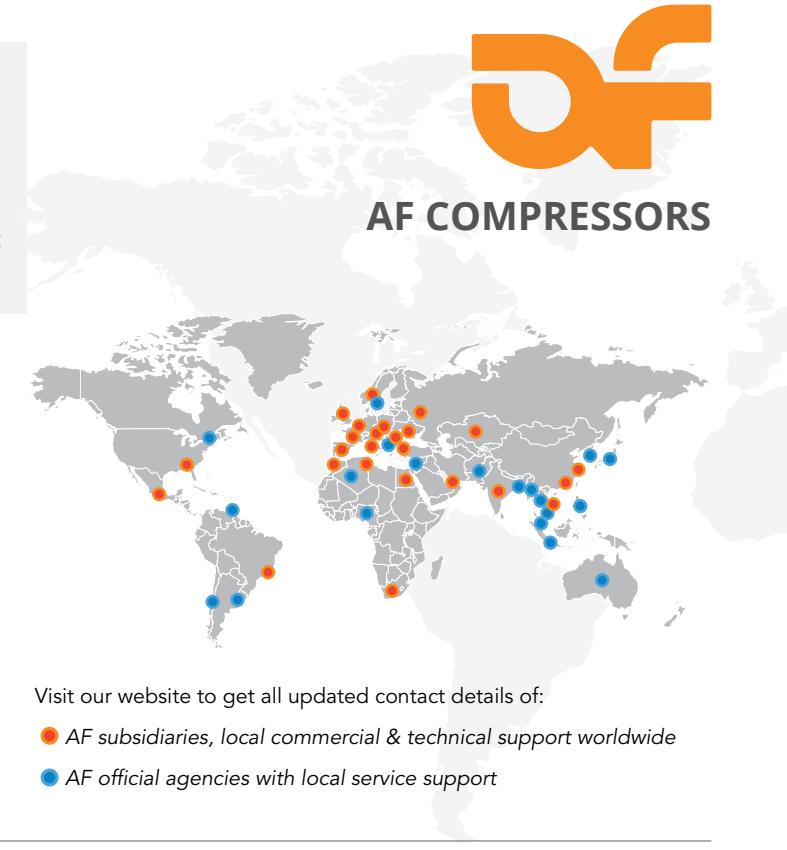
15 Subsidiaries with local spare parts centers:

- More than 20 service agencies for local spare parts and service support
- 2 distribution centers: Europe + Middle East

Algeria
Argentina
Australia
Austria
Bangladesh
Belgium
Brazil
Cambodia
Canada
Chile
China
Czech Republic
Egypt
Finland
France
Germany

India
Indonesia
Kazakhstan
Lebanon
Luxembourg
Malaysia
Mexico
Morocco
Myanmar
Nigeria
Norway
Pakistan
Peru
Philippines
Poland
Romania

Russia
Serbia
South Africa
South Korea
Spain
Sweden
Switzerland
Thailand
Trinidad & Tobago
Tunisia
Turkey
UAE-Dubai
Ukraine
United Kingdom
USA
Vietnam



Visit our website to get all updated contact details of:

- AF subsidiaries, local commercial & technical support worldwide
- AF official agencies with local service support

Head Office Commercial dpt.
opc@afcompressors.com

Ateliers François S.A.
Rue Côte d'Or 274
4000 Liège - BELGIUM
+32 4 229 70 10
central@afcompressors.com
TVA: BE0403953332



WWW.AFCOMPRESSORS.COM

OPCgenbroch20200323