

20-40  
BAR

OIL FREE  
PISTON COMPRESSORS  
THE WORLD LEADER  
OF PET COMPRESSORS



AF COMPRESSORS



[WWW.AFCOMPRESSORS.COM](http://WWW.AFCOMPRESSORS.COM)

# INNOVATION AND TRADITION

in compressed air industry  
since 1870

“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.

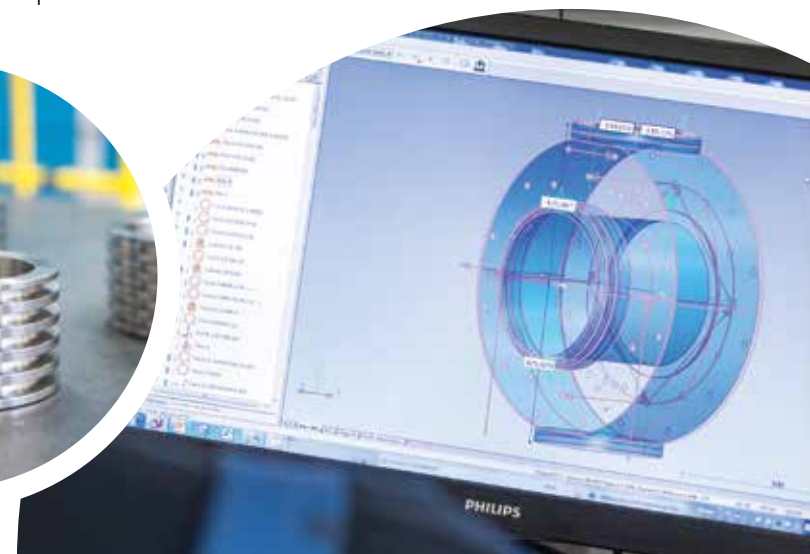
State of the art test bench to confirm air capacity to ISO 5167-2003 and ISO 1217-2009 standards.



## 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.

Our customers include the most renowned blow mold manufacturers and major beverage producers of soft drinks, water, juices, teas, and other applications where dependable compressed air is required.

Today, AF has over 6000+ compressor installations in over 175 countries around the world.



## 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.

## 2000

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

## TODAY

Leading manufacture of oil free piston compressors with 60% share of the PET compressor market.

## 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.

## 2010

AF expands a product range for lower pressure applications to include two-stage, oil free piston compressors dedicated to the beverage, food industry and other industrial applications.



# A COMPLETE RANGE OF CAPACITIES

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



3 STAGE

OIL FREE PISTON

PET COMPRESSORS

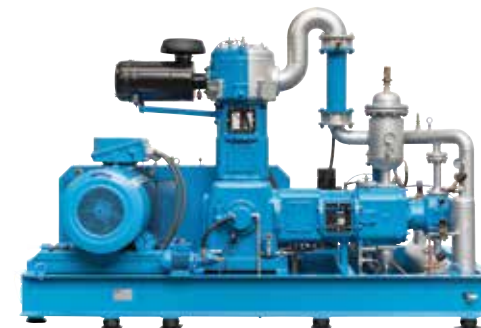
*See our AF Range brochure to discover the detailed range of capacities for 20-40 bar PET compressors.*



## M2 series

Nominal capacity from **150 to 225 m<sup>3</sup>/h FAD** (88 to 132 CFM), motor power from **30 to 45 kW**

Motor service factor 1.0, capacities ISO 1217.



## CE2, CE24 & L3 series

Nominal capacity from **312 to 770 m<sup>3</sup>/h FAD** (184 to 453 CFM), motor power from **55 to 132 kW**

Motor service factor 1.0, capacities ISO 1217.

20-40 bar: 150 ▶ 3300 m<sup>3</sup>/h



## L5 series

Nominal capacity from **1260 to 1680 m<sup>3</sup>/h FAD** (742 to 989 CFM), motor power from **200 to 280 kW**

Motor service factor 1.0, capacities ISO 1217.



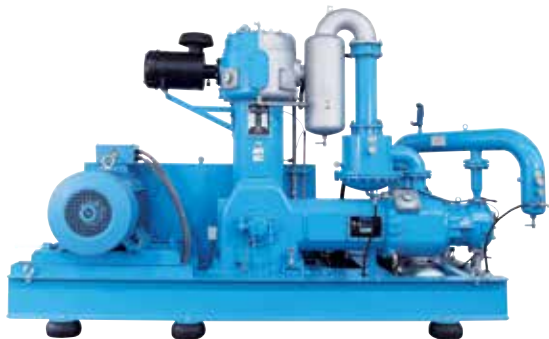
## L6 series

Nominal capacity from **1760 to 2170 m<sup>3</sup>/h FAD** (1036 to 1277 CFM), motor power from **280 to 355 kW**

Motor service factor 1.0, capacities ISO 1217.







#### L4 series

Nominal capacity from **910 to 1160 m<sup>3</sup>/h FAD** (536 to 683 CFM), motor power from **132 to 160 kW**  
Motor service factor 1.0, capacities ISO 1217.

**OPC  
RANGE**

## 6-15 BAR 2 STAGE OIL FREE PISTON COMPRESSORS

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



#### OPC series 8 bar

Nominal capacity from **7,7 to 54,5 m<sup>3</sup>/min FAD** (272 to 1925 CFM), motor power from **45 to 355 kW**  
Motor service factor 1.0, capacities ISO 1217.

6-15 bar:  
7,2 ▶ 54,5 m<sup>3</sup>/min



#### L7 to L9 series

Nominal capacity from **2330 to 3300 m<sup>3</sup>/h FAD** (1371 to 1942 CFM), motor power from **400 to 550 kW**  
Motor service factor 1.0, capacities ISO 1217.



#### OPC series 10 bar

Nominal capacity from **7,2 to 54 m<sup>3</sup>/min FAD** (254 to 1907 CFM), motor power from **45 to 355 kW**  
Motor service factor 1.0, capacities ISO 1217.

Pressures up to 15 bar on request @ [sales@afcompressors.com](mailto:sales@afcompressors.com)

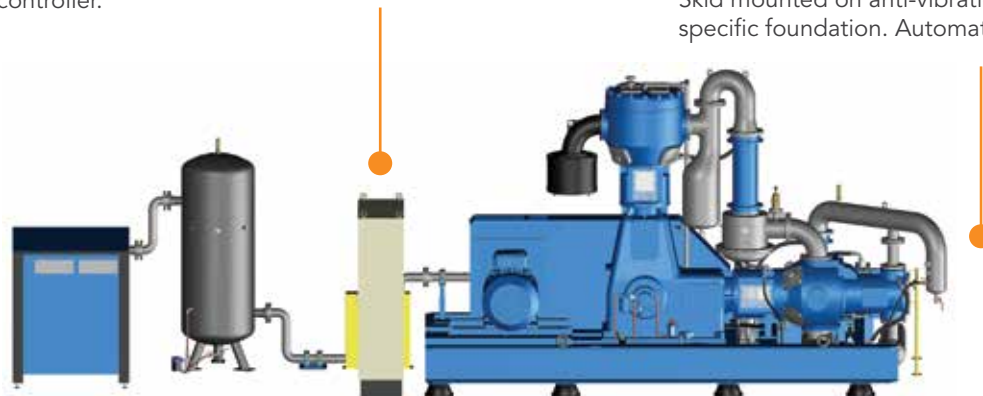
# TURNKEY SOLUTIONS for PET bottling

## Control Cabinet:

Fully interconnected with the whole compressor package. Includes star delta starter and PLC controller.

## Compressor Bare Unit: 20 to 40 bar

3 stage, 3 cylinders, 2 piston rod assemblies  
Electric motor & V-belt transmission.  
Skid mounted on anti-vibration mounts, no specific foundation. Automatic draining system.

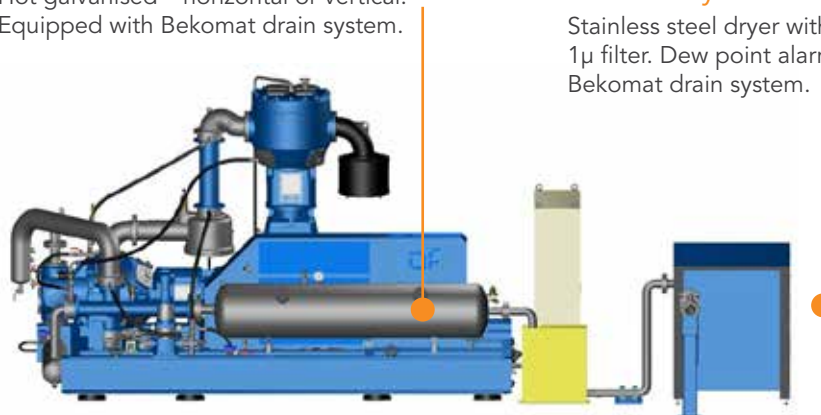


## HP Air Receiver:

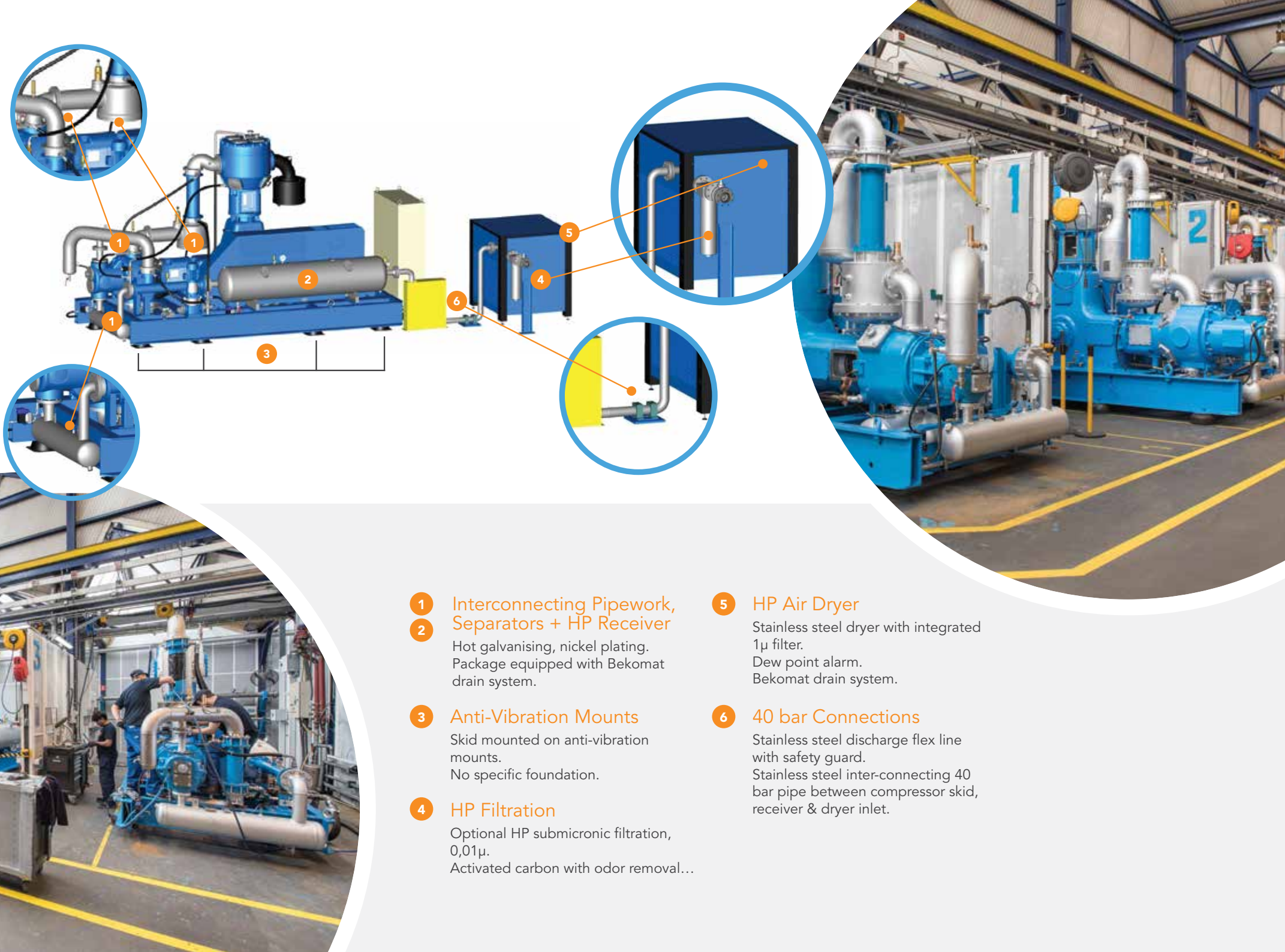
Hot galvanised – horizontal or vertical.  
Equipped with Bekomat drain system.

## HP Air Dryer:

Stainless steel dryer with integrated  
1 $\mu$  filter. Dew point alarm and  
Bekomat drain system.







**1 Interconnecting Pipework, Separators + HP 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 HP Filtration**

Optional HP submicronic filtration, 0,01µ.  
Activated carbon with odor removal...

**5 HP Air Dryer**

Stainless steel dryer with integrated 1µ filter.  
Dew point alarm.  
Bekomat drain system.

**6 40 bar Connections**

Stainless steel discharge flex line with safety guard.  
Stainless steel inter-connecting 40 bar pipe between compressor skid, receiver & dryer inlet.

# WATER-COOLED, OIL FREE, 3 STAGE, piston PET compressor



“Lowest maintenance costs.  
Lowest energy costs.  
Fewest moving parts.  
Lowest speed.”



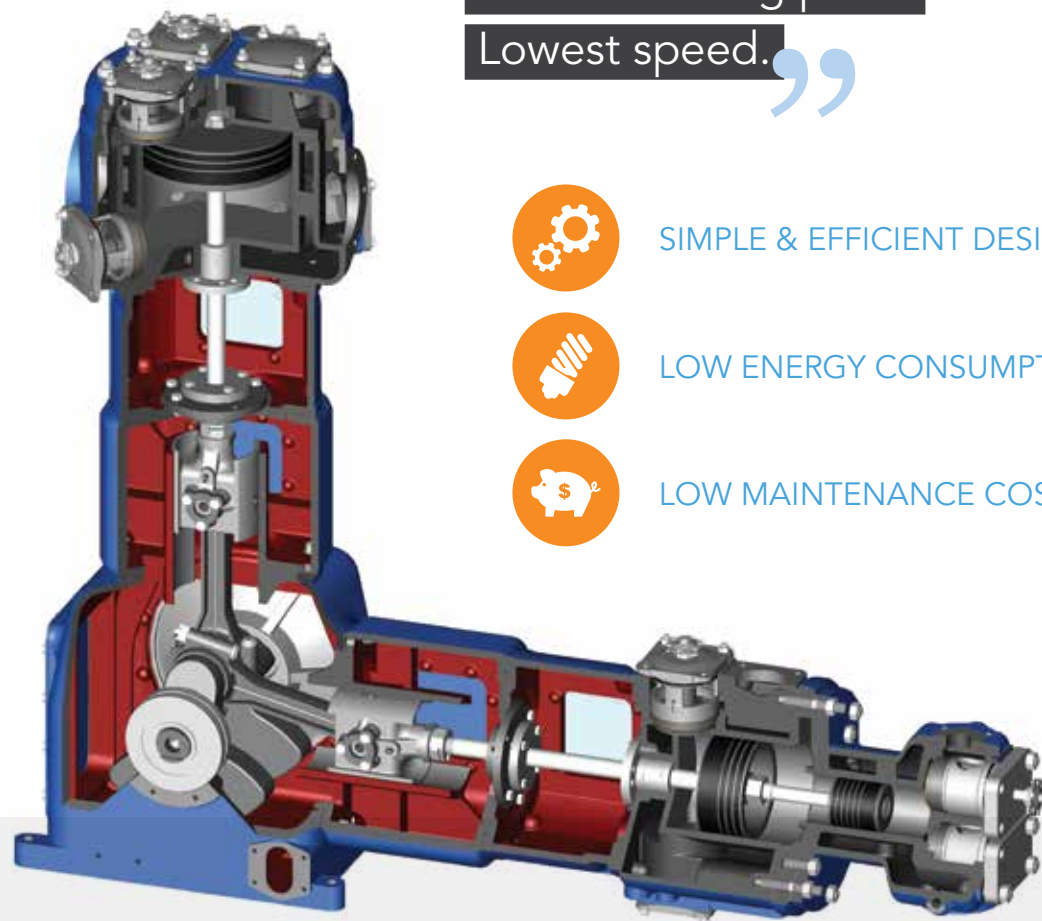
SIMPLE & EFFICIENT DESIGN



LOW ENERGY CONSUMPTION



LOW MAINTENANCE COSTS



Only two cross-head assemblies, two connecting rods and associated bearings.  
No piston rod packing on 3<sup>rd</sup> stage, which eliminates sealing against 40 bar pressure.

Single acting 2<sup>nd</sup> and 3<sup>rd</sup> stages, requiring few valves.  
Smaller 2<sup>nd</sup> and 3<sup>rd</sup> stages horizontal to optimize the piston ring life.  
Few valves and reduced energy losses.

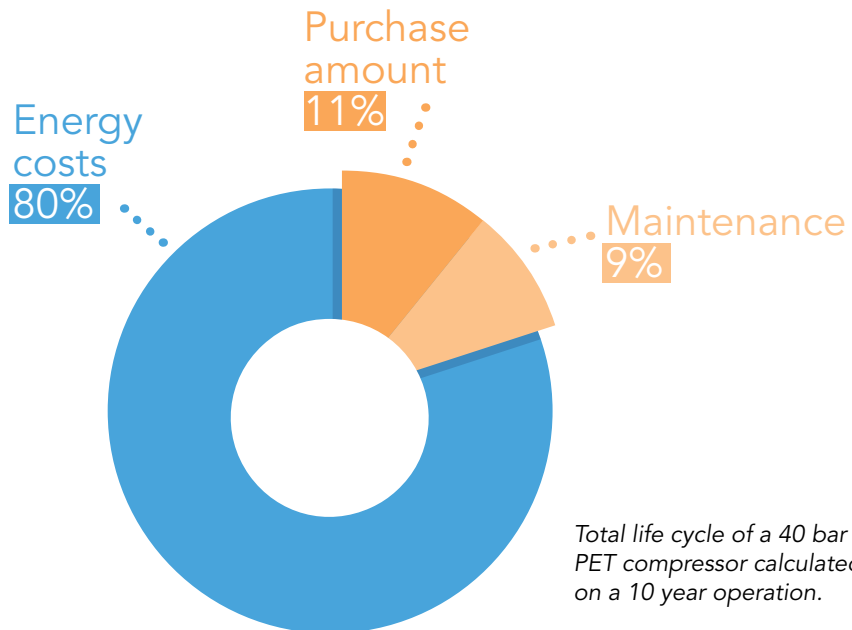


High  
efficiency.



Longer component life, less friction, low speed:  
340 rpm to 745 rpm.  
Less wearing parts as described above.

- Easy access on the machine for maintenance.  
Reliability and easy maintenance.  
Less time for maintenance.
- Easy and quick installation due to the use of  
anti-vibration mounts, no specific foundation is  
required: low investment costs for installation.



80% of the total cost of operating a PET  
manufacturing plant is in energy consumption.

AF compressors offer the lowest energy consumption and  
will provide your facility with direct energy savings!

Energy costs are increasing worldwide and neglecting its  
importance could result in higher operating expenses in the  
future.

AF compressors offer immediate energy savings and the  
money saved will increase your company's profits starting on  
day one.

# 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.

### Radiator cooling systems

Standard selections for ambient temperatures up to 32°C and oversized units for temperatures up to 36°C. The radiator fans and water pump are controlled by the compressor's electrical cabinet.

For locations where the air temperature reaches 40°C, the cooling unit is equipped with an automatic spray system with thermostatic control.

Separate cooling systems are supplied with:

- Water circulating pump, expansion tank, and accessories for the inlet/outlet connections of the cooling tower.
- Antifreeze glycol, when required and suitable to site conditions.



### The water pump

is mounted on the compressor's base plate.







## 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 13).
  - Fully Packaged Frequency Inverter (see page 14).



## 40 BAR CERTIFICATIONS & EQUIPMENT OPTIONS

### 40 bar air receiver options

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

### Additional 40 bar 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

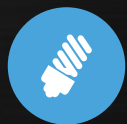
40 bar activated carbon filter with either stainless steel or cast aluminum housings.

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.



## AVAILABLE OPTIONS

for energy & cost savings

### SAVINGS THROUGH



#### DESIGN



ALL IN ONE: High and low pressure simultaneously

#### REGULATION



SIS: SMART INVERTER STARTER



AFS: ADJUSTABLE AIR FLOW SYSTEM

FREQUENCY INVERTER Full Size Pack

#### CONTROLLING



MULTI-COMPRESSOR CONTROLLER  
MONITORING & MANAGEMENT

#### RECOVERY



HRS90: HEAT RECOVERY SYSTEM • 90°C

HRS40: HEAT RECOVERY SYSTEM • 40°C







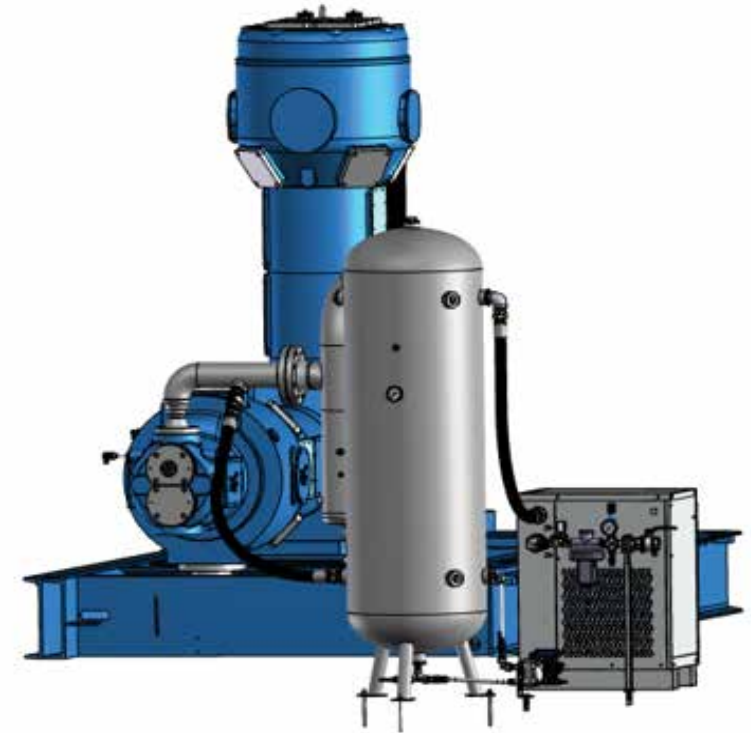
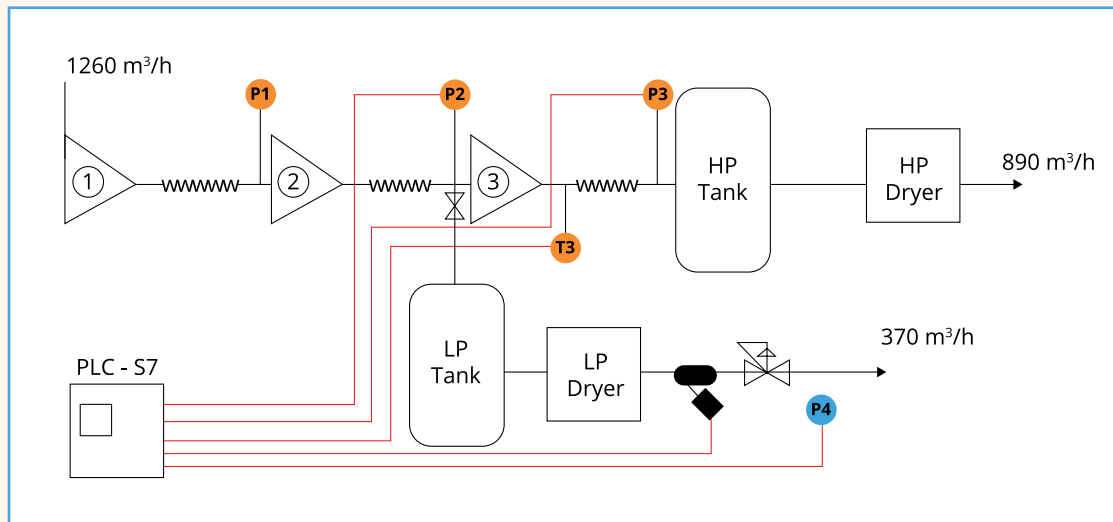
## ALL IN ONE

One compressor system simultaneously makes  
**HIGH PRESSURE AIR 20-40 bar** + **LOW PRESSURE AIR 8-12 bar**



### AF PLC CONTROLS STAGES 1 & 2 INDEPENDENTLY FROM STAGE 3

- Stage 1 & 2 = compressor 6-13 bar  
Stage 3 = booster 20-40 bar
- LP air supplied by AF All In 1 replaces entirely a separate LP oil free compressor
- LP volume from 100 to ... m<sup>3</sup>/h

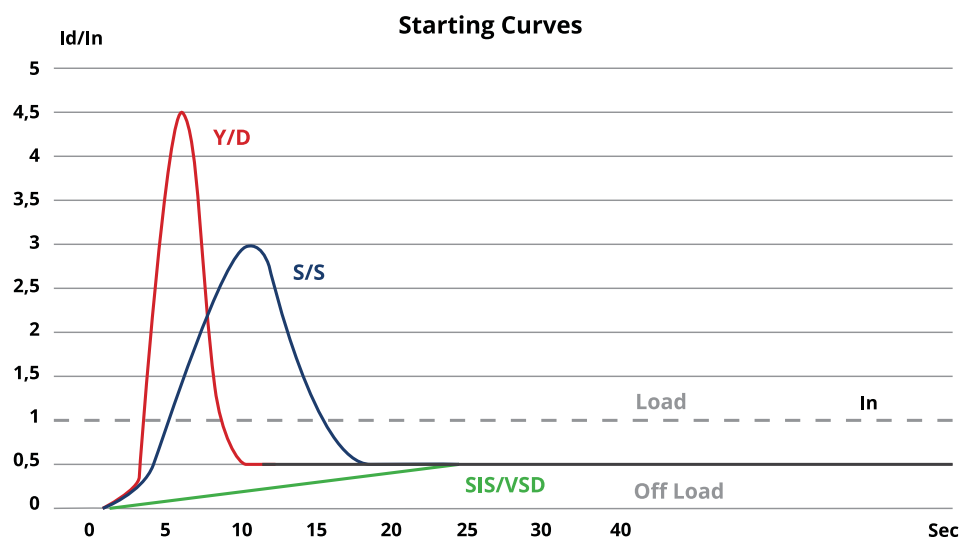




# SIS: Smart Inverter Starter

STARTING CURRENT *FAR BELOW* NOMINAL CURRENT

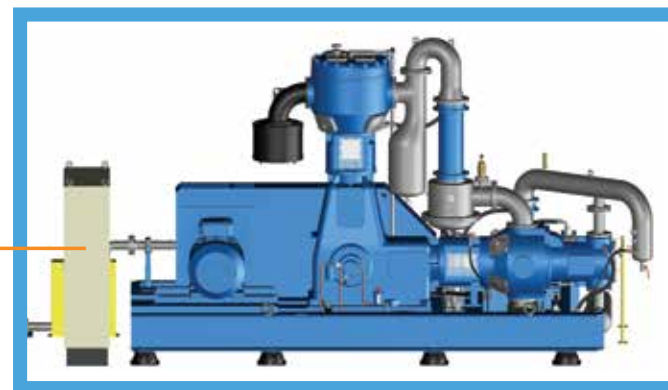
SPECIFIC FREQUENCY INVERTER ELECTRICAL CABINET FOR STARTING PURPOSE.



▶ 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

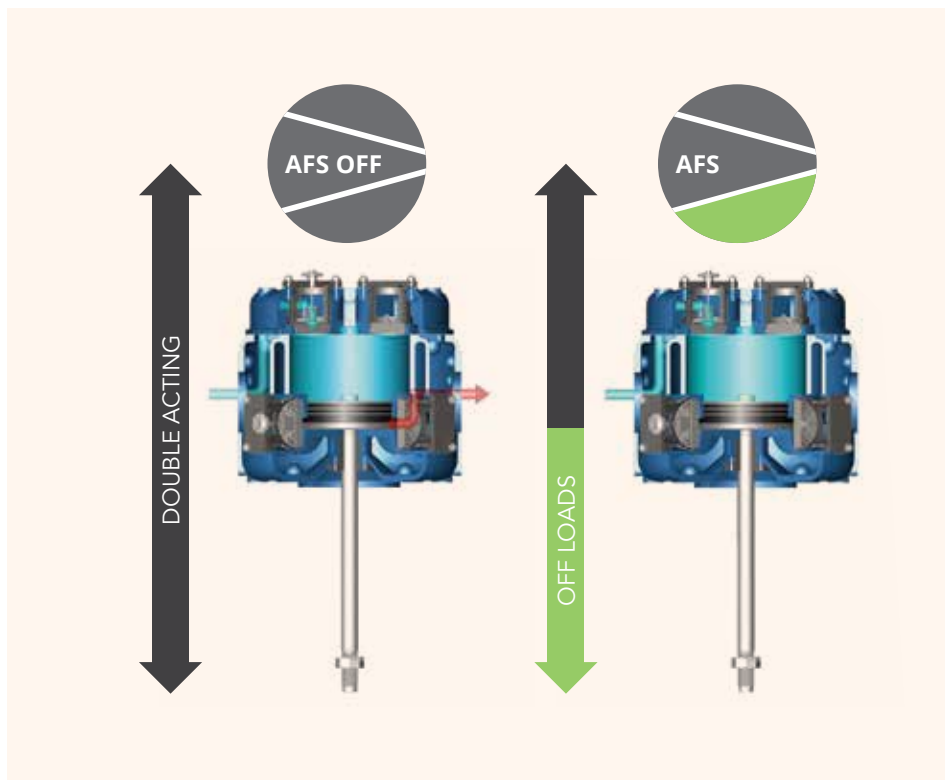
1<sup>st</sup> stage double acting cylinder compresses the air on the up and down stroke of the piston. This raises the atmospheric air to 4 to 5 bar achieving the most important pressure ratio.

At full load 1<sup>st</sup> stage double acting cylinder produces 100% of rated capacity to provide 100% air to the blow molder.

#### For 55% air capacity

1<sup>st</sup> 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.





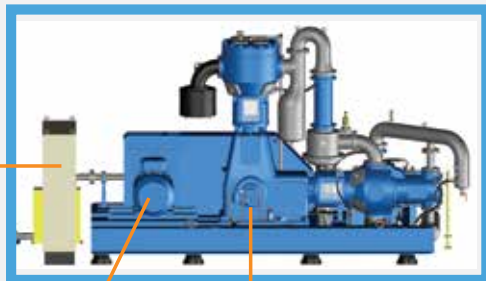
# FREQUENCY INVERTER Full Size Package

DECREASING THE **SPEED** ► INCREASING THE **SAVINGS**

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

## Speed adaptation via frequency inverter.

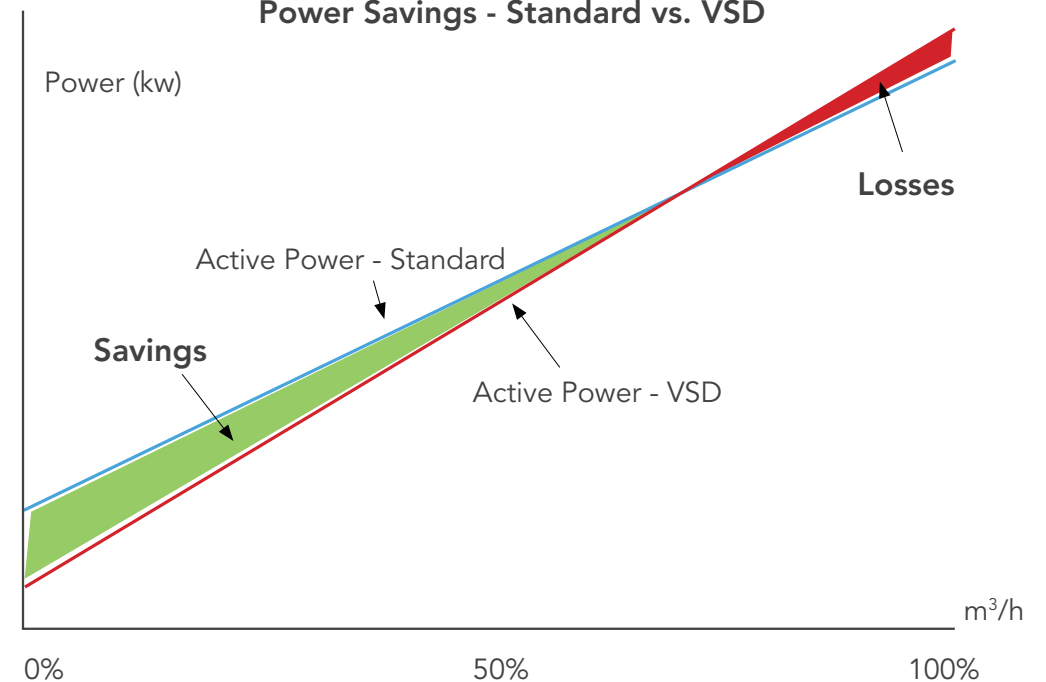
- **frequency inverter** electrical **cabinet**.
- **specific motor**. Isolated bearings...
- electrical **pre-lubrication pump**.
- shielded cabling... other protection device.
- LHF, Line Harmonic Filters.



## Variable speed

- Starting current of max 1,2 times nominal.
- Power factor ( $\cos \phi$ ) 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.

## Power Savings - Standard vs. VSD







# MULTI-COMPRESSOR CONTROLLER

## Monitoring & management

— 100% responsive —

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.

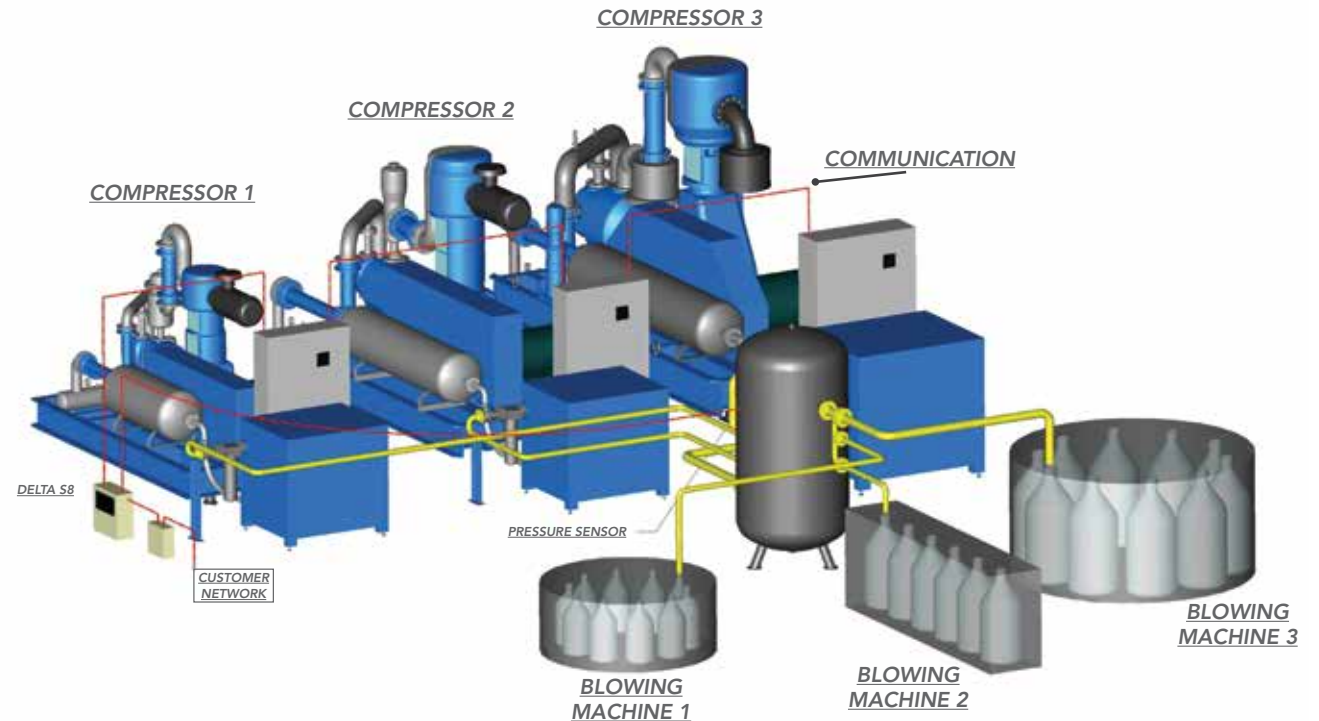
### Siemens Delta S8 and S12

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



### Installation

Compressors connected to the same pneumatic network, with collector or air receiver.





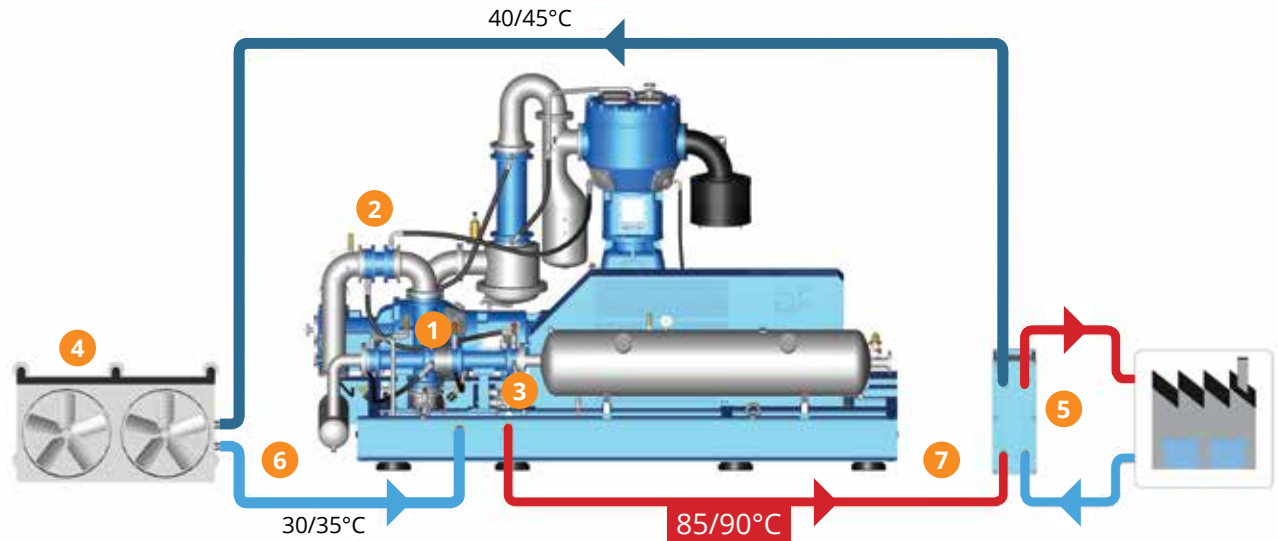
# HEAT RECOVERY SYSTEM 90°C



## SCOPE OF DELIVERY

### Heat Recovery System 90°C including :

- 1 Specific double cooler 2<sup>nd</sup> and 3<sup>rd</sup> stage. Special design for 1<sup>st</sup> stage intercooler.
- 2 Internally adapted water circuit.
- 3 The compressor runs with a smaller water pump with frequency inverter, "VSD".
- 4 The compressor runs with a smaller separate water cooling system.
- 5 External Heat Exchanger Kit for easy connection to the customer system.



## FEATURES & BENEFITS

### Features based on L 5 model /200 kW.

- Temperature ▶ 6 30-35°C water in - between 85-90°C water out. 7
- Power ▶ heat recovered @ 40 bar on load is ca.160 kW = ca.80% of shaft power.
- Water ▶ Available quantity of water for Heat Recovery is ca. 2 m³/hour water flow for L5 model.
- Due to HR a smaller separate cooling system is used for the complete compressor system. 4

One year operation, 6000 running hours @ 0.05 € / kW Heat = 48.000 € savings.







# HEAT RECOVERY SYSTEM 40°C

## SCOPE OF DELIVERY

### Heat Recovery System 40°C including :

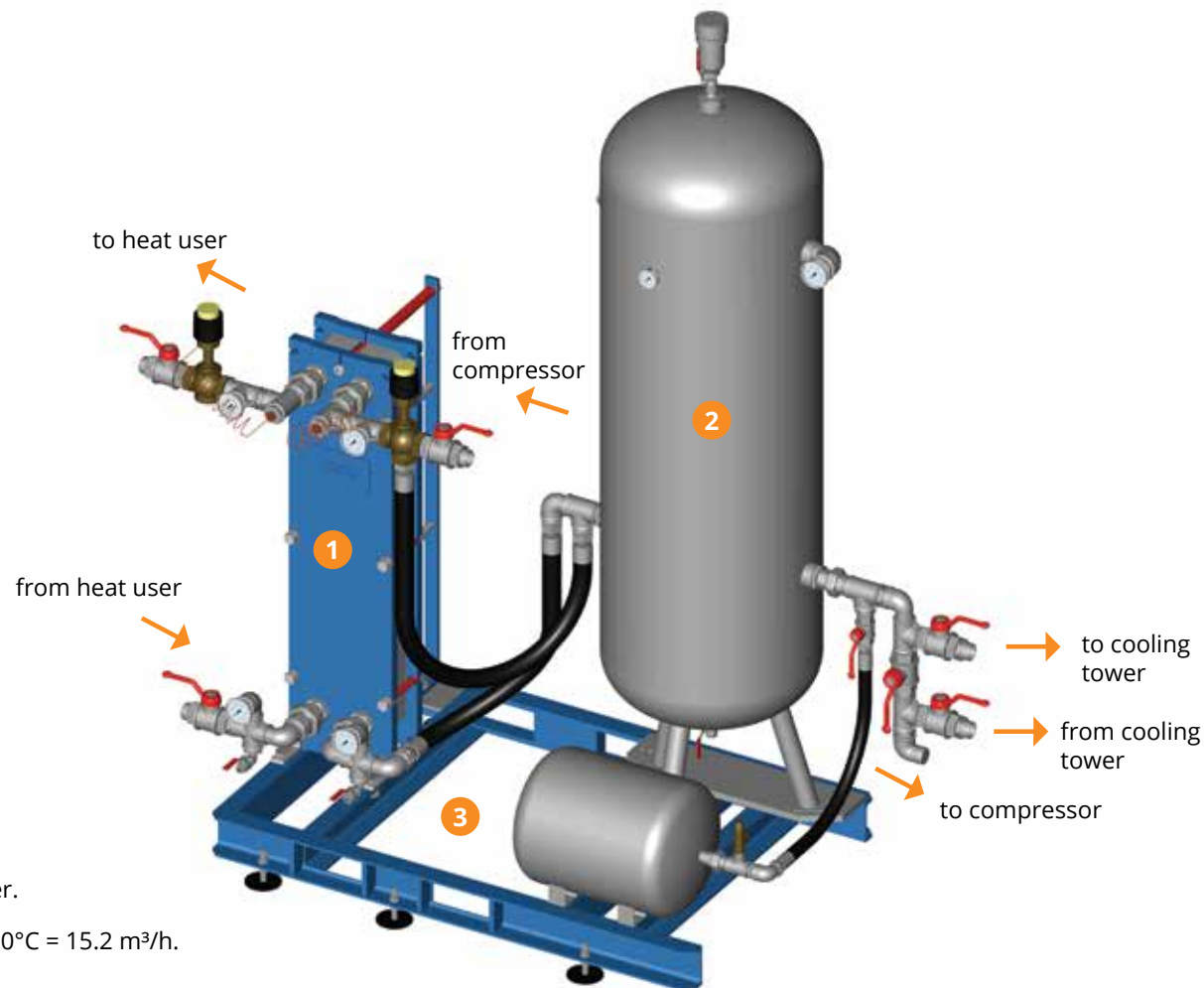
External skid Heat Recovery System 40°C with stainless steel plate exchanger.

- 1 Stainless steel heat exchanger, dismantable, with connecting flanges & water piping.
- 2 500 l water receiver , vertical with accessories mounted on the skid.
- 3 Ready to use system, fully connected with expansion vessel and valves, temp. gauges...
- 3 Skid with plug and play connecting points , supplied loose with adaptable feet for easy connections to the water circuit of the customer.

## FEATURES & BENEFITS

### Features based on 200 kW. Either CE or L series

- Temperature ▶ water in : 29°C, water out available for HR 39°C.
- Power ▶ heat recovered @ 40 bar on load is ca.160 kW = ca.80% of shaft power.
- Water ▶ Available quantity of water for Heat Recovery Max 40°C Delta temp. 10°C = 15.2 m³/h.



## 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

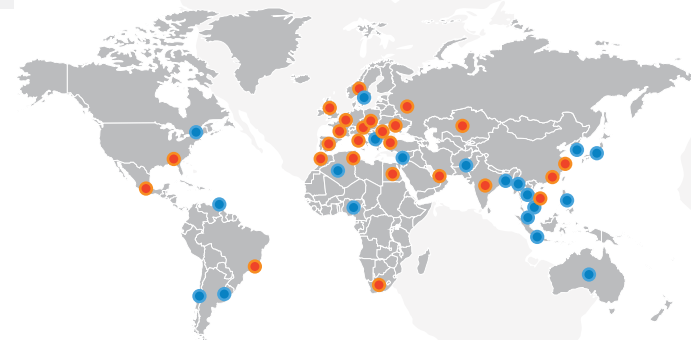
Algeria  
Argentina  
Australia  
Austria  
Bangladesh  
Belgium  
Brazil  
Cambodia  
Canada  
Chile  
China  
Czech Republic  
Egypt  
Finland  
France  
Germany

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



**AF COMPRESSORS**



Visit our website to get all updated contact details of:

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

### A GROWING TEAM AT YOUR SERVICE...

- More than 150 specialized technicians.
- Spare parts centers for immediate parts availability.
- Technical experts to provide high level support and from each subsidiary.
- Multilingual & local service support.
- Key account management, area and technical managers.
- 24/7: round the clock service worldwide and hotline: +32 4 239 96 60.

**Head Office Commercial dpt.**

+352 26 95 66 34

sales@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**



PETgenbroch20200824