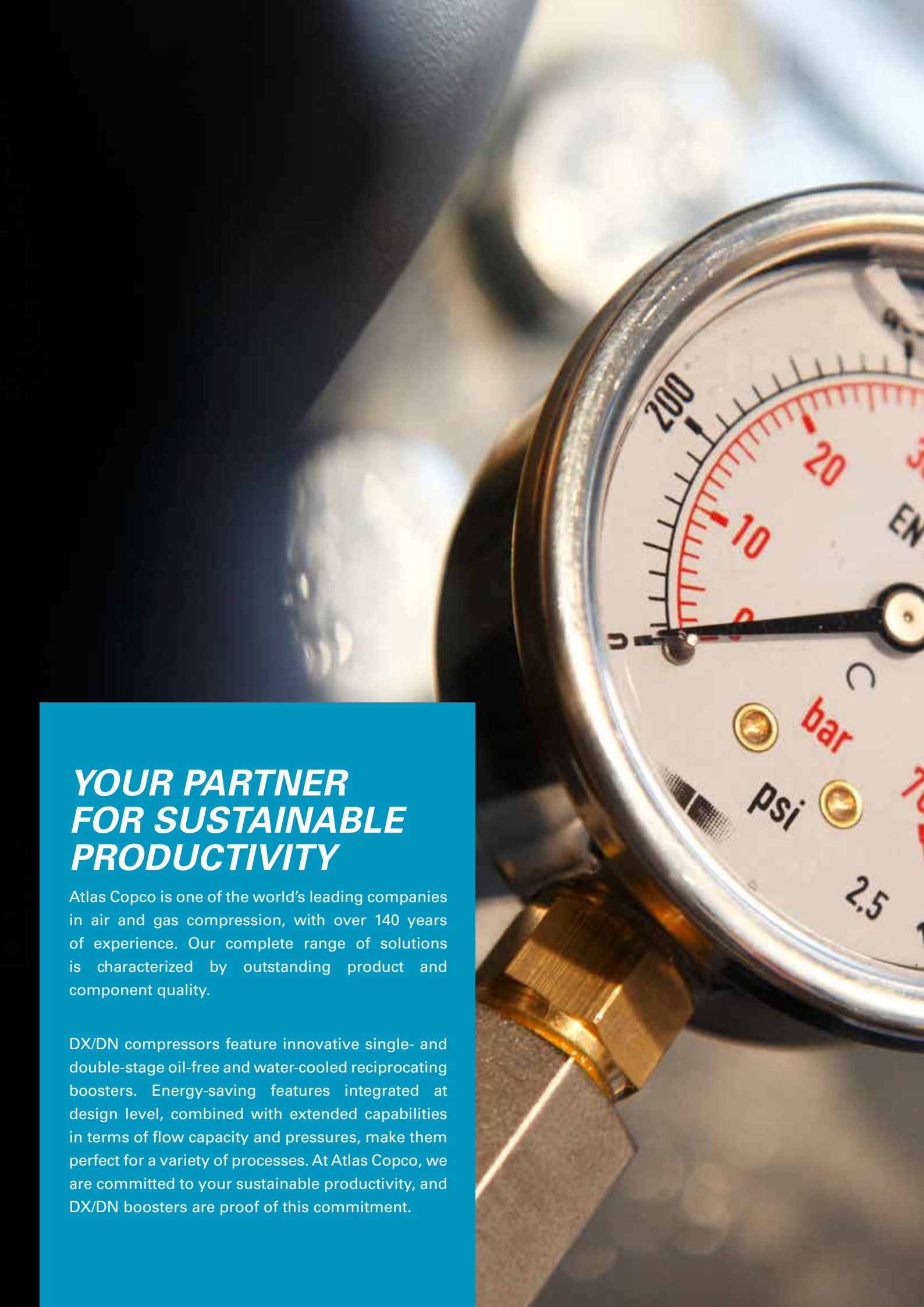
OIL-FREE AIR AND NITROGEN RECIPROCATING BOOSTERS

DX/DN (37-315 kW)



Atlas Copco



YOUR PARTNER FOR SUSTAINABLE PRODUCTIVITY

Atlas Copco is one of the world's leading companies in air and gas compression, with over 140 years of experience. Our complete range of solutions is characterized by outstanding product and component quality.

DX/DN compressors feature innovative single- and double-stage oil-free and water-cooled reciprocating boosters. Energy-saving features integrated at design level, combined with extended capabilities in terms of flow capacity and pressures, make them perfect for a variety of processes. At Atlas Copco, we are committed to your sustainable productivity, and DX/DN boosters are proof of this commitment.





Keeping your production up and running 24/24

Designed for industrial service 24/24, Atlas Copco DX/DN compressors work reliably at all times without the need for constant supervision. Their sturdy design leads to extremely low vibration levels. Proof of their reliability can be found in the thousands of machines installed in the field, where they provide a smooth and reliable supply of air or nitrogen.

Protecting your process with oil-free technology

Oil-free compression safeguards the quality of the compressed air and nitrogen. In most applications, even the slightest pollution is unacceptable and could lead to high risks for your production. Atlas Copco supplies the highest quality of air and nitrogen with boosters certified to Class 0 according to ISO 8573-1.

Maximizing your savings

DX/DN boosters benefit from the latest technological developments. Highly energy efficient by design, they incorporate integrated coolers and innovations in valve sizing to maximize energy savings. Variable Speed Drive (VSD) and heat recovery versions further improve your bottom line, not as a one-shot saving, but throughout their full lifetime.

Assuring a perfect integration in your process

Atlas Copco is your complete solution provider, with an extended range of air, nitrogen and gas treatment solutions. By working with a single supplier able to meet all your needs, maintenance is simplified and cost-effective.





OUTSTANDING PERFORMANCE – MAXIMUM BENEFITS

Choose Atlas Copco DX/DN reciprocating boosters for high-quality oil-free air and nitrogen in the harshest environmental conditions. They provide a long and trouble-free life at the lowest possible operating cost in all types of industries worldwide.



Metal-working

For aluminium, metal or steel production, nitrogen is used in many different processes such as blanketing, annealing, heat treating and degasing. Atlas Copco DX/DN oil-free boosters are innovative, sturdy machines that are ideal to serve these industries 24/24.

Electronics, cable, rubber and plastics

In these industries, protection of the end product against impurities and oxidation is fundamental. Thanks to oil-free, condensate-free operation, DX/DN boosters deliver the high-quality nitrogen that is essential for various applications.

Food, beverage and pharma

Class 0 air purity is vital for these industries. The DX/DN is the right choice to preserve end product integrity.

Aeronautics, automotive, general industry

While high-pressure air is needed for tests in the aeronautics and automotive industries, a hydro-electric power plant will use it for turbine dewatering and regulation. In all these and many other applications, the added value offered by the DX/DN range through Variable Speed Drive and heat recovery will maximize the energy savings.

OIL-FREE TECHNOLOGY: SAFE FOR YOUR PROCESS

Oil in your process can lead to severe consequences such as spoilt or unsafe products, production downtime or even legal issues. In addition you can't rely on a filter, because filters deteriorate. Atlas Copco is extremely demanding when it comes to delivering the best quality, and offers technology that guarantees oil-free compression:

- Long-distance pieces equipped with sealing rings ensure physical separation between the crankcase and the cylinders.
- The length of the piston rod is optimally calculated so that no part in contact with oil enters the compression chambers.
- Packings with sealing rings ensure tightness between the cylinder and distance piece.
- Piston rings and wear bands are made of PTFE.

Class 0: A step forward in purity

ISO 8573-1 (2010) establishes a comprehensive classification and measurement methodology in which Class 0 represents the best possible air quality. The Atlas Copco DX/DN air compressors have been tested by the TÜV and certified as complying with Class 0 for air purity. This means that they do not alter the quality of the air which enters the booster.

We add no oil to your process

If the air entering the booster complies with Class 0 certification, then air will comply with class 0 at the outlet. DX/DN boosters add no oil to your process. This is also of utmost importance to preserve the nitrogen purity at the booster outlet. For other air or nitrogen qualities at booster inlet, we can recommend the most optimal filters.

ISO CLASS 0



RELIABILITY FOR INDUSTRIAL OPERATION 24/24

1

Sturdy, horizontal balanced arrangement



- Extremely low vibration level with low center of gravity for reduced wear of mobile parts and extended life of piston rings.
- Concrete baseplate ensures no vibrations are transmitted to the floor and pipings.

Sturdy technology with twin sleeve bearings, placed at flywheel side, ensuring perfect condition of the shaft line for increased reliability.



2

Outstanding cooling due to excellent temperature approach and oversized coolers, resulting in longer life of components and extended maintenance intervals.



Condensate-free: a major asset to high reliability with no deterioration due to condensates and increased piston ring and valve duration.

Conform construction standards

- Electrical standards: IEC – UL/CSA.
- Mechanical standards: CE, ASME, SQRL, MHWL.
- Safe area ATEX on request.

“Nitrogen ready” as a standard

- Specially adapted boosters for maximum reliability and safety.

Cost-effective maintenance

- Reliability factors reduce service levels and intervals between maintenance operations.
- Clear and simple-to-use Elektronikon® monitoring system, with scheduled maintenance sequences.
- High level of standardization of components reduces costs and increases availability.



High efficiency with optimized design

- By law of thermodynamics, reciprocating technology saves energy.
- Perfectly balanced pressure ratios reduce energy consumption.
- Valve optimization = flow optimization.
- Integrated dampers in cylinder casting mean fewer pipes and pressure drops.



Adaptable to your process

- Discharge pressure: between 4 and 46 bar G (single-stage) or 25 to 42 bar G (double-stage) allows consumption to be adapted and significantly reduced.

High-efficiency motor

- 440V/3ph/50 Hz,
  440/460V/3ph/60 Hz – Class F – IP55.



3

Easily centralized management

- Integrated IP54 electric cubicle with additional functions: ON/OFF and alarm of water pump, cooling unit or tower for easier service operations.

5

Easy plug & play installation for time and cost savings

- Concrete baseplate – no anchoring necessary.
- Easy transport – forklift slots available.
- Everything included – only water, power and air/nitrogen connections needed.

Functional canopy

- Ensures low noise level and safe access (lockable doors).
- Standard for air; optional for nitrogen.



4

Smart control with Elektronikon® unit controller

- The Elektronikon® Unit Controller collects and analyzes local data then adjusts equipment operation to improve performance
- The unit controller is designed to ensure increased safety for you, your product, and your process
- To better adapt our product to meet your specific needs, many different remote control and notifications functions are included as standard.

DRIVE DOWN YOUR ENERGY COSTS WITH VARIABLE SPEED DRIVE

Over 70% of a compressor's lifecycle cost is taken up by the energy it consumes. Moreover, the generation of compressed air can account for more than 40% of a plant's total electricity bill. To cut your energy costs, several decades ago Atlas Copco pioneered Variable Speed Drive (VSD) technology. VSD leads to major energy savings, while protecting the environment for future generations. Thanks to continual investment in this technology, Atlas Copco offers the widest range of integrated VSD compressors on the market.

Up to 35% direct energy savings

VSD saves the energy traditionally lost due to the idle or partial load running of the machines. The wider the fluctuation range, the more efficient is VSD. With DX/DN VSD, the regulation range extends from 40% to 100% without speed windows. This leads to a very high level of energy savings.

Ensuring stability of your process

Constant outlet pressure over a wide capacity range (narrow pressure band within 0.1 bar) or if your supply is not steady optimizes energy consumption and ensures process stability.

High savings with low starting current

With VSD technology there is no current peak at start-up. The starting current is equal to the nominal current during the start-up phase. This eliminates the need to oversize your equipment to absorb peaks.

Save on investment with high and stable power factor

Regardless of the flow variation, the power factor remains constant at a high value (Cos Phi 0.99). This means that no additional investment needs to be made to correct the power factor, avoiding penalties from the utility company.

Quiet operation

Thanks to smooth operating modes, DX/DN machines are quiet: 77.3 to 83.9 dB(A).

Preserving compressor integrity saves maintenance costs

The VSD booster operation is smooth and stepless. When running continuously in loaded condition, the compressor is in its optimal regime. This means less stress on mechanical parts and longer service life of components.



On average 35% energy savings

Atlas Copco's DX/DN VSD technology closely follows the air demand by automatically adjusting the motor speed. This results in on average 35% energy savings. The lifecycle cost of a compressor can be cut by an average of 22%. In addition, lowered system pressure with DX/DN VSD dramatically minimizes energy use across your production.

Total compressor lifecycle cost

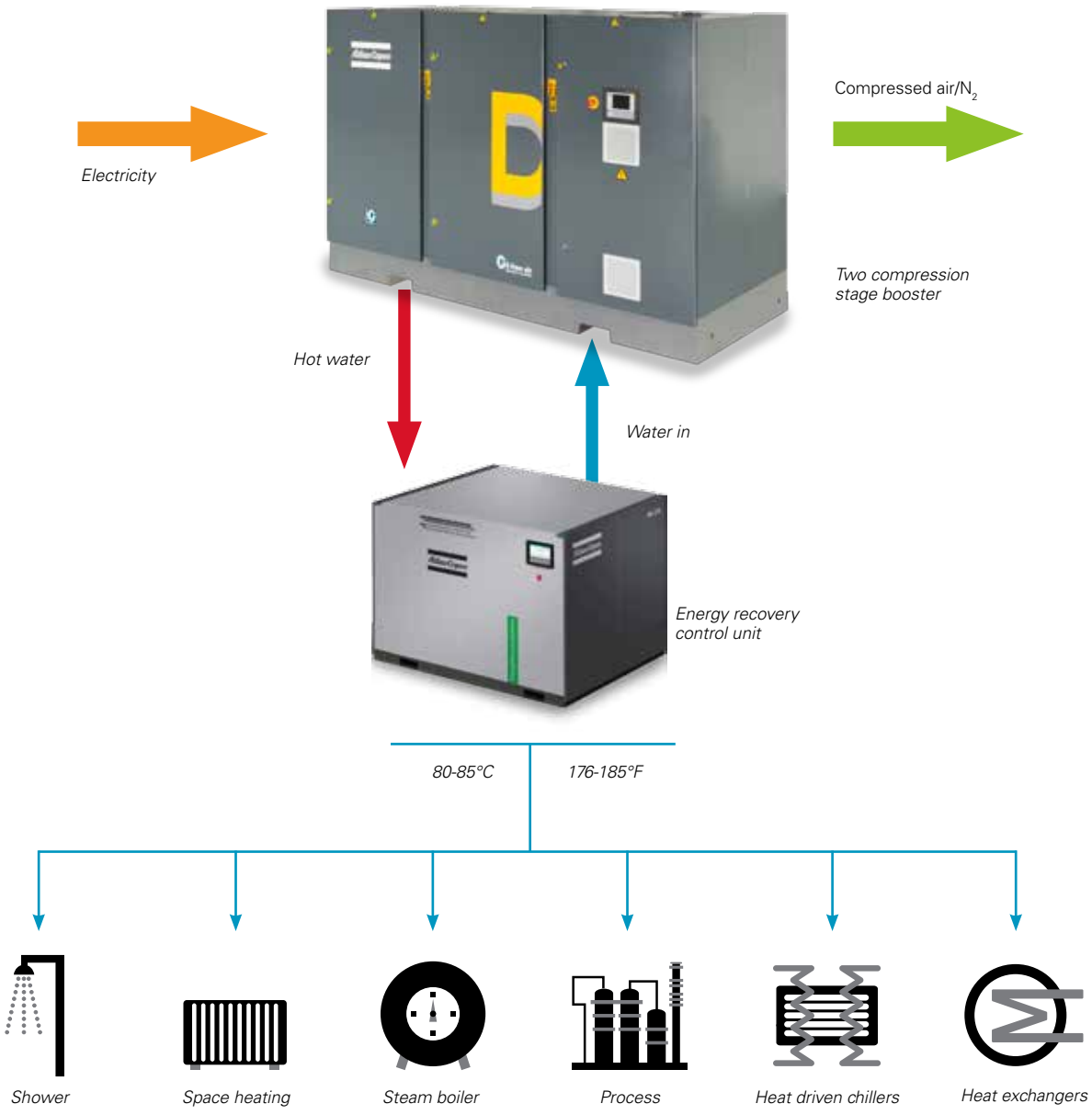
- *Energy*
- *Investment*
- *Energy savings with VSD*
- *Maintenance*

INCREASE YOUR SAVINGS WITH ENERGY RECOVERY

The Kyoto directives and the continuing depletion of traditional energy sources are driving businesses throughout the world to make commitments to significantly reduce overall energy consumption. Through innovative products and solutions, Atlas Copco helps you achieve your goals in this area. When it comes to compressed air production – where energy costs can constitute 70% of total lifecycle costs – saving energy can also lead to substantial cost savings.

Warm air heat recovery

Air compression creates heat that is normally wasted in the coolers. Energy recovery systems designed by Atlas Copco enable the recovery of most of this heat. Recovery of energy from the shaft input of the booster can be up to 94% of the booster shaft power. The heat is directly usable as a source of energy in the form of hot water (80-85°C/176-185°F). The main module of the recovery system is placed near the booster.



TUNED TO YOUR PROCESS FOR HIGHER EFFICIENCY

Pressures can be tuned to your exact needs to save energy.
This means that every kW invested is used to compress air or nitrogen.

Inlet pressures:

- Double-stage DX/DN: between 5.5 and 9.7 bar G (79.7 and 140.6 psig).
- Single-stage DX/DN: between 3 and 39 bar G (43.5 and 565.6 psig).

Discharge pressures:

- Double-stage DX/DN: between 25 and 42 bar G (362.5 to 601.1 psig).
- Single-stage:
  - 30 bar range: between 3.6 and 31 bar (52.2 to 450 psig).
  - 40 bar range: between 3.6 and 46 bar G (32.2 and 667.1 psig).



Flow adapted to your process

DX/DN boosters are designed either as single- or double-stage machines. Single-stage boosters are built either with 1 or 2 inlet cylinders which allow for high volume. These boosters are ideal in numerous air and nitrogen processes due to their extended capabilities.

Flows:

- Single-stage: between 125 and 19,000 Nm^3/h (73.6 to 11,183 scfm).
- Double-stage: between 350 and 3,700 Nm^3/h (206 and 2178 scfm).



Filtration adapted to your process

Humidity:

DX/DN boosters accept:

- Air quality with dew points between -80°C and +40°C (-112 to 104°F).
- Nitrogen quality with dew points between -80°C and +20°C (-112 to 68°F).

Depending on the quality available, we provide the most suitable coalescent filters (inlet/outlet).

Oil content:

DX/DN boosters are Class 0. They add no oil to the process. When the oil content at the booster inlet is above 5 ppm, we add a suitable oil separator.



Adapted to PET market discharge pressure evolutions

Most of the compressors in PET blowing installations are designed for 40 bar. However, due to the evolution in PET processes, compressors are now used at a much lower pressure. DX/DN boosters perfectly fit the new requirements of the PET industry with two different ranges:

- Discharge pressures between 25 and 30 bar / 362 and 435 psi.
- Discharge pressures between 25 and 40 bar / 362 and 580 psi.

Huge energy savings

Adapting your machine to your exact needs drastically cuts your energy bill. These models have additional versions such as VSD or energy recovery for increased energy savings.

ADVANCED CONTROL AND MONITORING

The Elektronikon® unit controller is specially designed to maximize the performance of your boosters and air treatment equipment under a variety of conditions. Our solutions provide you with key benefits such as increased energy efficiency, lower energy consumption, reduced maintenance times and less stress: less stress for both you and your entire air system.

Intelligence is part of the package

- High resolution color display gives you an easy to understand readout of the equipment's running conditions.
- Clear icons and intuitive navigation provide you fast access to all of the important settings and data.
- Monitoring of the equipment's running conditions and maintenance status; bringing this information to your attention when needed.
- Operation of the equipment to deliver specifically and reliably to your compressed air needs.
- Built-in remote control and notifications functions provided as standard, including simple to use Ethernet based communication.
- Support for 31 different languages, including character based languages.

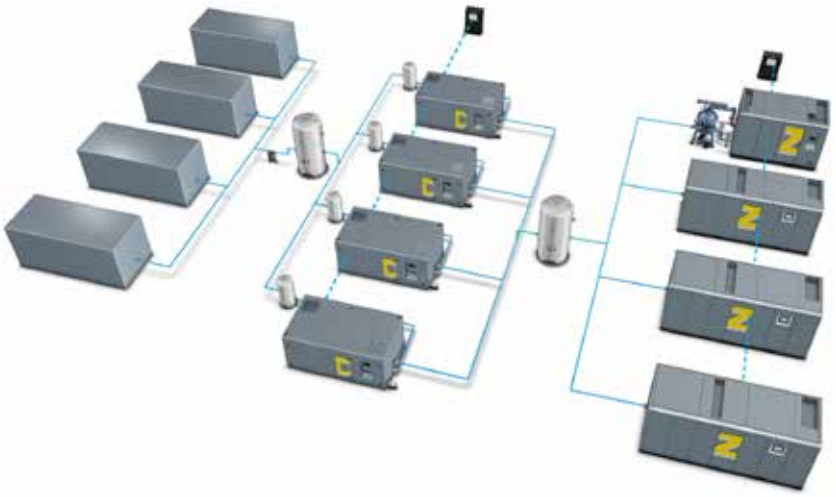


MANAGE YOUR LOW- AND HIGH-PRESSURE NETWORKS SEPARATELY AND SAVE COSTS

In your production plant, you often need two different networks: a high-pressure network and a low- or medium-pressure network (service air, instrument air). With the Atlas Copco DX/DN, you can adapt the size and number of machines to your exact requirements. You can choose machines for base load or top load, or mix VSD and fixed speed machines. This approach substantially saves energy and maintenance costs compared to extra standalone machines. We can work with you to calculate the most efficient set-up.

Well appreciated in the workplace

Being very quiet, with a sound-proofing canopy, DX/DN boosters can be installed in the workplace. Not only does this lead to a comfortable working environment, but it reduces pipework necessary and the resulting pressure drops. In addition, the machines are easily accessible at normal working height, and feature easy, centralized management. Lockable doors limit access to the boosters to authorized personnel.



Machines of different sizes managed with ES controllers, delivering air to Strech Blow Moulding machine for PET bottle production.

NITROGEN SOLUTIONS: A MATTER FOR SPECIALISTS

Nitrogen needs to be handled safely. A high concentration of nitrogen in a closed area can cause suffocation. In addition, nitrogen can cause deterioration of the internal components of the machines. At Atlas Copco, we take all these factors into account to supply a safe and reliable machine.

The perfect integration into your process

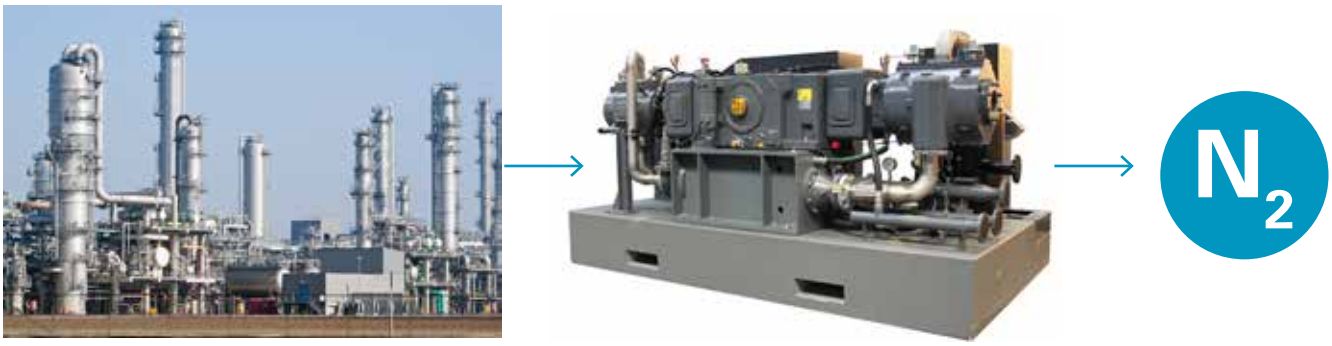
Nitrogen quality at inlet

Depending on your upstream process (PSA, gas evaporator, cryogenic, membrane or another compressor), the nitrogen quality will differ. Atlas Copco DX/DN boosters can accept different nitrogen qualities:

- Pure nitrogen, with less than 0.5% oxygen.
- Crude nitrogen, with more than 0.5% oxygen.
- With dew points between -80°C and +20°C (-112°F and 68°F).

Adapted boosters

Atlas Copco DX/DN boosters are "nitrogen ready" as standard. We adapt the booster speed and material of the piston rings and packings according to the on-site quality and dew point. We also adapt the coalescent filters when required.



Optional canopy

When equipped with a canopy, Atlas Copco DX/DN boosters are fully nitrogen-safe. They are fitted with gas meter, gas detector, safety valve, gas piping to skid, limit vent, and leakage recovery.





COMPLETE PLUG & PLAY SOLUTIONS

Thanks to an unmatched portfolio of technologies and equipment, Atlas Copco can provide complete solutions.

COMBINED TECHNOLOGIES

- Screw, centrifugal and reciprocating compressors.
- Nitrogen generators.
- Gas dehydration and purification units.
- Biogas upgrading equipment.

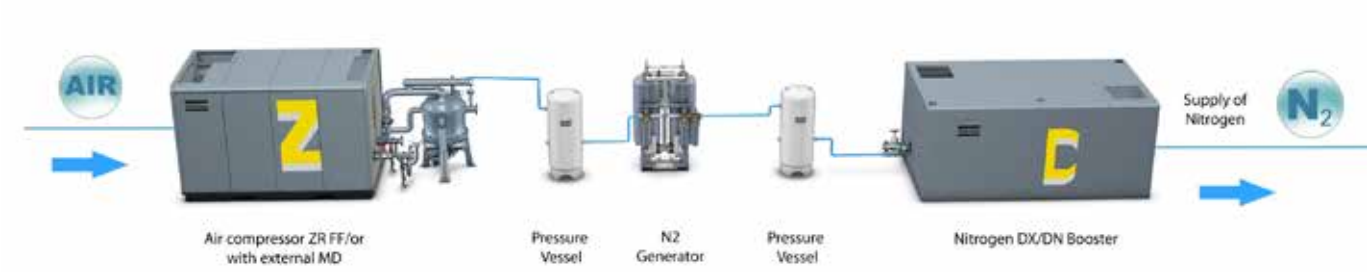
ADAPTED ACCESSORIES

- Filters.
- Dryers.
- Pressure vessels.
- Water pump skids.
- Cooling units and cooling towers.
- Open heat exchangers.
- Power distribution boards.

SOLUTION BENEFITS

- Low total lifecycle costs.
- Solutions engineered by specialists.
- A single supplier.
- Easy and cost-effective maintenance.

From air to N_2



From low pressure to high pressure





Customized solutions

In addition to these standard units, we develop completely engineered machines:

- Extra features.
- Different site conditions.
- Pressures up to 150 bar in air and nitrogen.

COMPRESSOR ROOM MANAGEMENT

Smart remote control

From simple monitoring to complete management of several compressors, Atlas Copco offers optimal, tailored service.

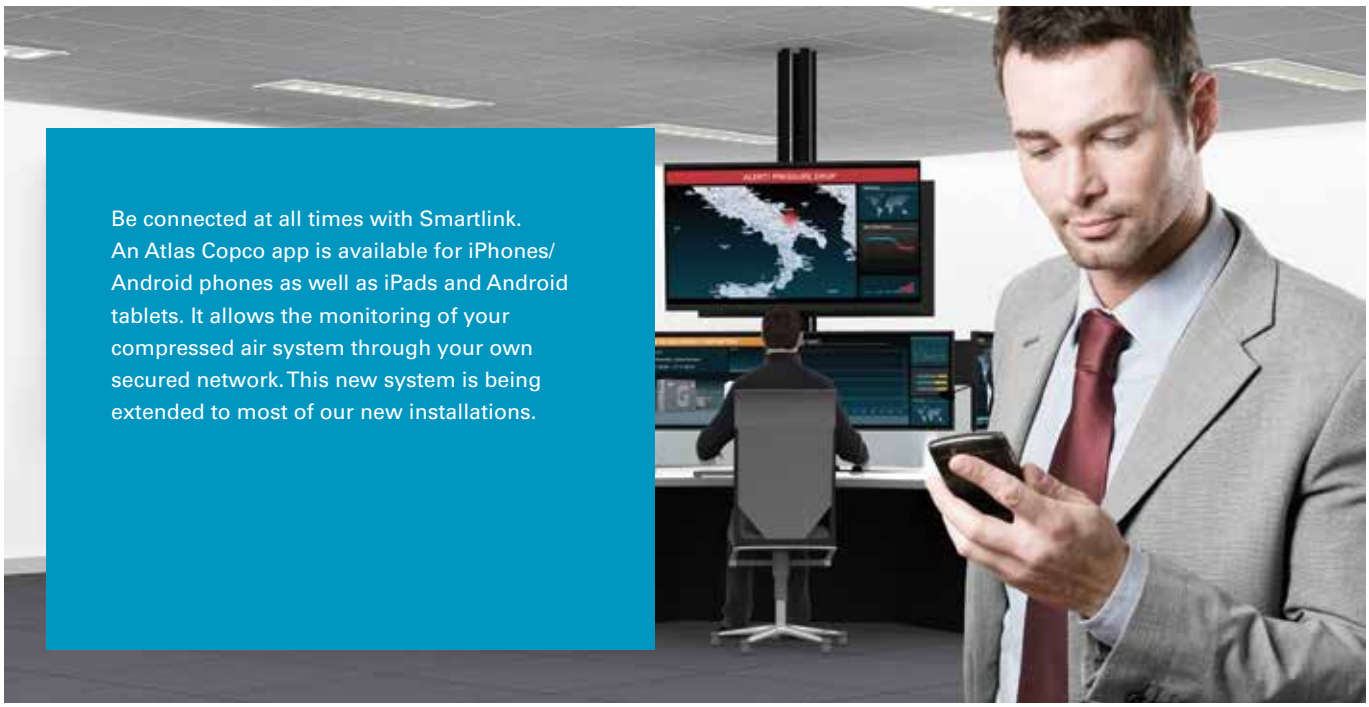
A clear vision for maximum productivity

With our easy to install Combox and through Fieldbus or Profibus (Ethernet) connection, all data observable on the Elektronikon® unit controller can instantly be visible in your plant's Distributed Control System. It allows you to supervise, anticipate and schedule maintenance, and manage working hours.

A step forward in energy saving

For a compressor room with several compressors, Atlas Copco has developed Energy Saving (ES) systems. They manage the machines based on demand. This allows for a smooth repartition of operation between different machines, saving energy and maintenance costs.





Be connected at all times with Smartlink. An Atlas Copco app is available for iPhones/ Android phones as well as iPads and Android tablets. It allows the monitoring of your compressed air system through your own secured network. This new system is being extended to most of our new installations.



IN THE FIELD

A worldwide presence

Our service engineers are available in more than 170 countries. This means we can offer service close to you, with easy dialogue in your own language, and immediate availability at minimal cost.

Specialists in gas compression

Regularly trained on our machines, our service engineers provide expert service. They can work with your own teams or within the frame of a global contract. Our service engineers ensure start-ups and post start-up support.

Genuine spare parts

We supply genuine spare parts that are the only guarantee of safety and preservation of the performance of your machines over the years. The 3D designs and specific literature supplied with each machine make it simple for you to organize maintenance and spare part ordering.





QUALITY MANAGEMENT: AIMING AT EXCELLENCE

At Atlas Copco, quality is at the core of all our processes; a demanding requirement that ensures customer satisfaction in our products and services.

A SHEQ long-term commitment: certified and recognized

Our quality approach is confirmed by the following certifications: ISO 9001, ISO 14001 and OHSAS 18001. We care for quality and safety, not only for our people in our factory but also for our suppliers and for our customers by providing reliable equipment and ensuring safe, healthy and respectful behavior. Atlas Copco is listed as one of the top companies in its industry in the prestigious Dow Jones Sustainability index.

0 default in safety assembly

The safety aspects are part of the DNA of our company starting from the design phase up to the final use of the compressor. This safety knowledge is now integrated in the 0 default pillar of the new Agile Manufacturing process. A benefit of this advanced quality system, following the automotive VDI 2862 guidelines, is a risk ranking on potential assembly default, which foresees a specific tightening error proofing solution to ensure a 0 default in Safety assembly, and is proven by the edition of a new quality & safety certificate.

Testing laboratory

At Atlas Copco we devote great attention to testing. This is a major step in the manufacturing process that confirms our desire to deliver the best quality machines. Our test benches comply with the ISO 1217 standard and are approved by APAVE. All sensors are connected to a computerized measurement acquisition system, which processes the measurements and calculates the performance. Its software is particularly user-friendly, enabling your engineers and inspectors to clearly understand and follow the measurements.

SCOPE OF SUPPLY

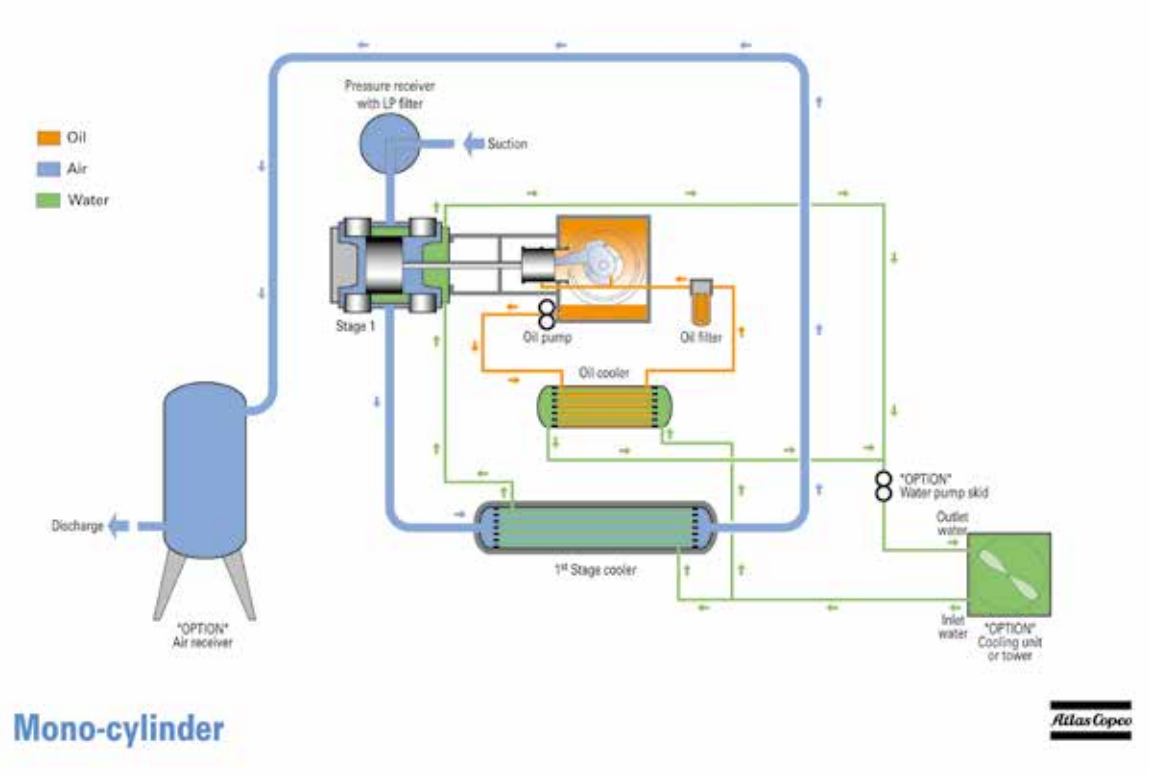
Oil-free reciprocating water-cooled booster DX/DN	
AIR or NITROGEN CIRCUIT	
Efficient inlet dampers with filters	√
Fixed speed unit: full load / no load regulation system	√
VSD unit: Variable Speed Drive (on 2 compression stage machines)	√
After-cooler	√
OIL CIRCUIT	
Heavy duty oil filters	√
Complete oil circuit	√
COOLING CIRCUIT	
Compressed air aftercooler	√
Intercoolers (stainless steel or copper) on 2 stage units	√
Oil cooler (above 90 kW)	√
Complete air or N_2, oil, water circuit	√
Recip Oil lubricant	√
ELECTRICAL COMPONENTS	
TEFC IP55 class F motor for high ambient temperatures up to 50°C/122°F	√
Fixed speed units: starters (star/delta) VSD: Convertor + starter	√
Pre-mounted and cabled electrical cubicle - high ambient temperatures up to 50°C/122°F (fixed speed or VSD)	√
Elektronikon® control system	√
Integrated fan in electric cubicle	√
SKID	
Concrete frame absorbing vibrations (no anchoring required, with slots for forklift)	√
NPT or ANSI Connections at skid limit	√
Canopy (air units)	√
Adaptation to N_2	
Canopy	O
Nitrogen detector	√
Canalized valves up to canopy limit (if canopy) - for further connection by customer	√
Canalized leakages up to canopy limit (if canopy) - for further connection by customer	√
Canalazable valves	√
Canalazable leakages at packing	√
Adapted piston rings, packings and speed	√
ADAPTATION TO AIR/N_2 QUALITY*	
Condensates separator at outlet (air/N_2 boosters) (only when required by dew point)	√
Coalescent filters at inlet (only when required by dew point, otherwise not applicable)	√
Coalescent filter at outlet (only when required by dew point, otherwise not applicable)	√

Customized set-ups	
Lower dew points than specified	To be studied by our custom design department
Additional aircooling (closed loop water circuit) on air boosters only	
Variable Speed Drive on single stage machines with 2 cylinders	
Additional elements (water pump, fans) on smaller size frames	
Accessories (other than standard accessories)	
Combined units with screw/centrifugal compressors, filters, receivers etc.	
Winterization	

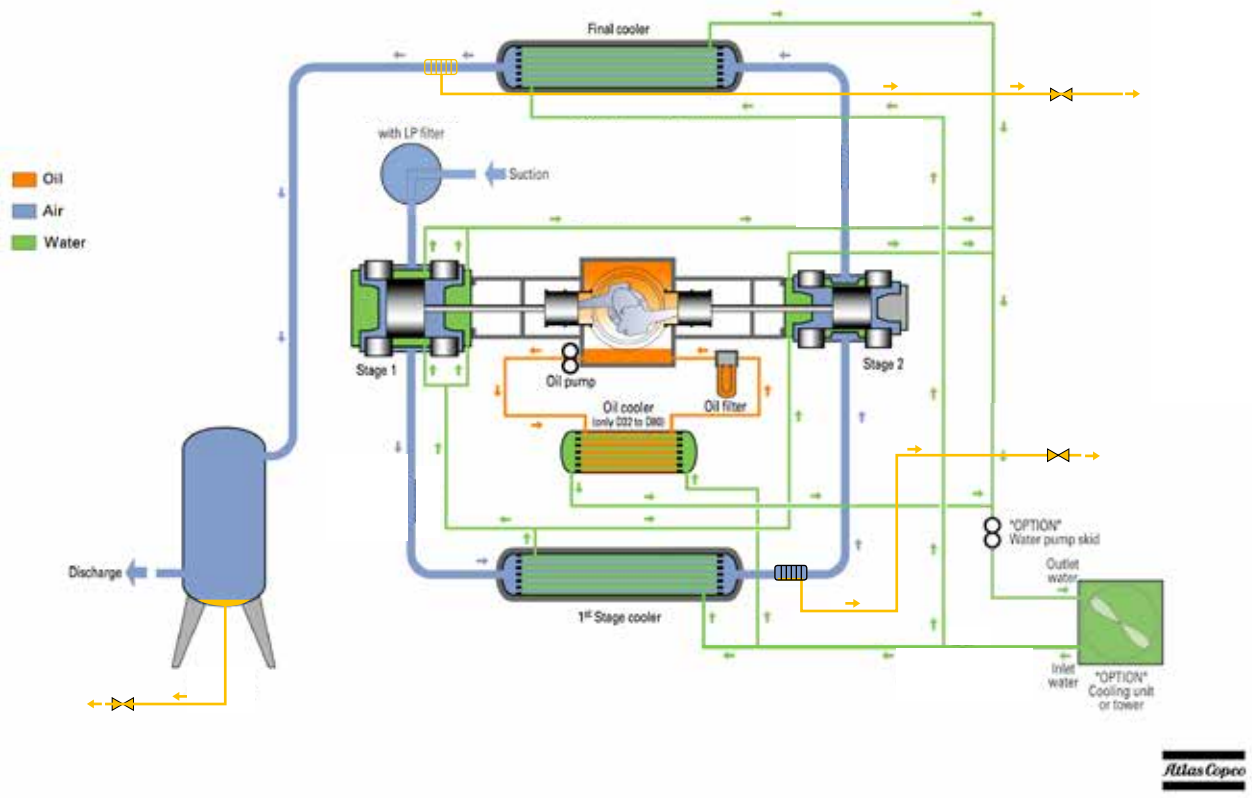
* Depends on inlet humidity, inlet gas temperature and cooling water temperature.
√: Standard
0: Optional

PRINCIPLE OF OPERATION

SINGLE-STAGE



DOUBLE-STAGE



A FULL RANGE WITH EXTENDED CAPABILITIES

		DX/DN 2 compression stages	DX/DN 1 compression stage 30 bar range	DX/DN 1 compression stage 40 bar range
Compression stages		2	1	1
Connecting rod and cylinder		2	1 or 2	1 or 2
Minimum/maximum inlet pressure	bar(g)	5.5*/9.7	3/26	3/39
	psi(g)	79.7*/140.6	43.5/377	43.5/565.6
Minimum/maximum pressure ratio		1.8/4.0	1.2/4.0	1.2/4.0
Maximum effective working pressure	bar(g)	42**	32	47
	psi(g)	609.1**	464.1	681.6
Maximum nominal working pressure	bar(g)	41	31	46
	psi(g)	594.6	449.6	667.1
Minimum nominal working pressure	bar(g)	25*	3.6	3.6
	psi(g)	362.5*	52.2	52.2
Electric power	Kw	37-315	37-315	37-315
	hp	49.5-422	49.5-422	49.5-422
Outlet flow	Nm^3/h	350-3700	125-19000	125-19000
	Scfm	206-2178	73.5-11183	73.5-11183
Drive		Fixed speed/VSD	Fixed speed	Fixed speed
Gas handled		Air/N_2	Air/N_2	Air/N_2
Canopy		Air=standard, N_2=option	Air=standard, N_2=option	Air=standard, N_2=option
Energy recovery option		Yes	No	No

*lower pressure on request
**higher pressure on request
Class 0 machine if inlet gas is class 0

WEIGHTS AND DIMENSIONS

	Weights	Dimensions
	kg	W x D x H (mm)
1 compression stage		
DX	7600	300 x 207 x 208
DN 1 cylinder	15000	370 x 213 x 213
DN 2 cylinders	18000	370 x 213 x 213
2 compression stages		
DX	10600	300 x 207 x 208
DN	16.600	370 x 213 x 213

COMMITTED TO SUSTAINABLE PRODUCTIVITY

We stand by our responsibilities towards our customers, towards the environment and the people around us. We make performance stand the test of time. This is what we call – Sustainable Productivity.

FSC
www.fsc.org
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Paper from responsible sources
FSC® C019084

CO2 neutral print
Certificate Number
887-10506-1111-1028
www.climatepartner.com

LLOYD'S REGISTER · LRQA
ISO 9001 · ISO 14001
OHSAS 18001

Atlas Copco

www.atlascopco.com

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