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Creating Efficient Compressed Air Systems To Keep Your Distribution Centre Operating At Maximum Productivity

Ingersoll Rand®

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Introduction: A Constantly Changing Market

The distribution and fulfilment industry is a highly competitive, constantly growing market, with the need for logistics and warehouse facilities continuously increasing. In 2020, the value of the global distribution market reached approximately €225 billion, with that figure expected to hit the €326 billion mark by the end of 2024.

In such a fast-paced and growth-oriented industry, falling behind is very easy. Therefore, to stay at the top of your game, ensuring the equipment in your facility is reliable and efficient is vital to keep you ahead. To maintain a top place in the market and continue providing the best services possible, manufacturers and distribution professionals should create a foolproof system that covers all eventualities. This applies to compressed air systems, too, which is an essential part of the running of your facility!

In This White Paper, You Will Learn:

- The uses of compressed air for distribution centres in the logistics and warehouse industries
- How to create an efficient compressed air system for a distribution centre
- How to select the right air compressor and the solutions we have available to you
- How to find service and maintenance programs that optimise the total cost of ownership

Compressed Air In The Logistics And Warehousing Industry

Compressed air is vital for an extensive range of applications and processes within a distribution centre, making an efficient compressed air system vital to keep everything running productively. The main goal of a compressed air system in logistics and warehousing facilities is to provide a continuous supply of clean, dry, compressed air at a stable pressure and at the lowest cost possible. However, designing a compressed air system that ensures efficiency, reliability, and safety requires thorough consideration and extensive technological knowledge of distribution centre applications.

Applications That Rely On Compressed Air In Distribution Centres

Air-Powered Dock Levellers

Compared to hydraulic levellers that utilise a hydraulic cylinder to position the leveller platform, dock levellers powered by compressed air use an airbag to raise and lower the dock. This technology uses air as the working media, instead of fluid, to inflate the airbag with high-volume, low-pressure compressors. This method simplifies operations and eliminates the problem of messy hydraulic fluids and leaky seals.

Moisture can potentially be an issue here, too! This makes a reliable downstream system invaluable to prevent equipment degradation from the rust and corrosion moisture can cause. This is particularly important in distribution centres, logistics, and warehouse environments to avoid injury caused by equipment or components rusting and breaking when lifting.

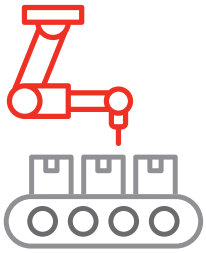
Another way to ensure a safe working environment is to have a solid maintenance plan in place to ensure the compressors creating the air for your air-powered equipment, including the dock levellers, are regularly checked. At Ingersoll Rand, we offer a suite of CARE maintenance plans and 24/7 remote monitoring with our Helix Connected Platform™ to ensure you are fully covered. This will provide you with complete peace of mind that your compressed air system is operating efficiently and safely!

Pneumatic Conveyors

Pneumatic (air-operated) conveyors are used to transfer a wide variety of products within a distribution centre or logistics and warehouse environment. The process begins with creating a vacuum within the hopper, which enables the materials to be suctioned for further discharge to their destination, like a container or packaging machine. A pneumatic transfer guarantees minimal contact with external factors, making it ideal for the logistics and warehousing industry, where clean air is vital!

When powering any sort of pneumatic tool or equipment, it's important to remember that moisture will always be the enemy! This is because, as mentioned above, moisture can have incredibly detrimental impacts on the performance and longevity of your equipment. Therefore, using dry, clean, compressed air with a low particulate count is essential to power your conveyors.

But how do you achieve dry air? The secret is an effective downstream system. For this particular application, we'd recommend using a desiccant dryer, which utilises absorbent material to get rid of moisture, thus producing ultra-dry compressed air. To accompany your compressed air dryer, a reliable filtration system is vital to remove moisture and other contaminants, such as oil, dust and solid particulates, from your compressed air. To complete your air treatment set-up, condensate management is essential, involving the use of an oil water separator and condensate drains to remove harmful condensate from your compressed air in a safe and environmental manner. By making sure your downstream system is up to the challenge, you are maximising the quality of your compressed air whilst also eliminating costly moisture damage. This way, you can protect your compressed air investment and still power your pneumatic conveyors efficiently!



Packaging Equipment

Compressed air technologies are utilised for blow-off applications that clean containers before filling them with products or to cut, shape and convey the products from one place to another. High-quality compressed air is essential here to help prevent product contamination and ensure customer safety and satisfaction. An effective downstream system, as mentioned above, would have many benefits here.

Benefits Of Air-Powered Equipment For Your Logistics And Warehousing Facility

Compressed air is often referred to as the fourth utility, as it is safe, economical, and easily conducted. Equipment powered by an air motor instead of a heavy internal motor offers many benefits. For example, it's lighter, more compact, and operator-friendly while also eliminating the risk of electric shock.

Air tools are also faster and more efficient, reducing strain on the user. Compared to electric-powered equipment, air tools have fewer moving parts and require much less maintenance, which also translates to decreased operating costs.

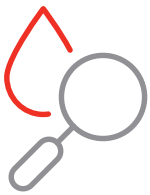
Removing the Pain Points

How To Create An Effective Compressed Air System For Your Logistics And Warehousing Distribution Centre

In conversation with some of our logistics and warehousing partners, we've learnt that creating an efficient, productive compressed air system is essential to ensure every element of your facility operates productively. But how can you do this without overcomplicating it or causing your costs to skyrocket? This is where we come in!

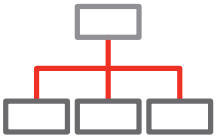
1. IMPLEMENTING THE RIGHT COMPRESSED AIR EQUIPMENT

As mentioned, using the wrong compressed air equipment for your distribution centre can have detrimental impacts on efficiency, thus skyrocketing your costs. This is why choosing the right equipment for your logistics and warehousing facility is vital! Adapting your equipment to market changes is also important, but it can be costly, so choosing energy-efficient, tried-and-tested designs is the best way to go, as they're more likely to keep up with industry shifts. In this white paper, you can view Ingersoll Rand's portfolio of expert compressed air solutions best suited to the demands and challenges of distribution centres.



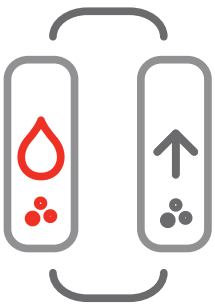
2. OIL SAMPLING

As mentioned, clean, dry, high-quality compressed air is essential for your logistics and warehouse distribution centre. To ensure air quality, an assessment called oil sampling can be done. This process analyses any external or internal contamination that may impact your compressed air system. By assessing the inner workings of your compressed air network and its ambient conditions, you can gain insight into any factors that may be impacting the quality of your system's oil and lubricants. It also gives you an overview of the current condition of your compressor's components. Identifying any issues or inconsistencies with your oil is vital to ensure efficient performance and optimal air quality. Frequent lubricant changes are recommended to eliminate the risk of safety breaches due to faulty, damaged equipment. This is particularly important for powering both pneumatic conveyors and air-powered dock levellers, as they're both heavy, dangerous pieces of equipment. It is also important to ensure your oil is meeting your particular industry's safety and quality standards.



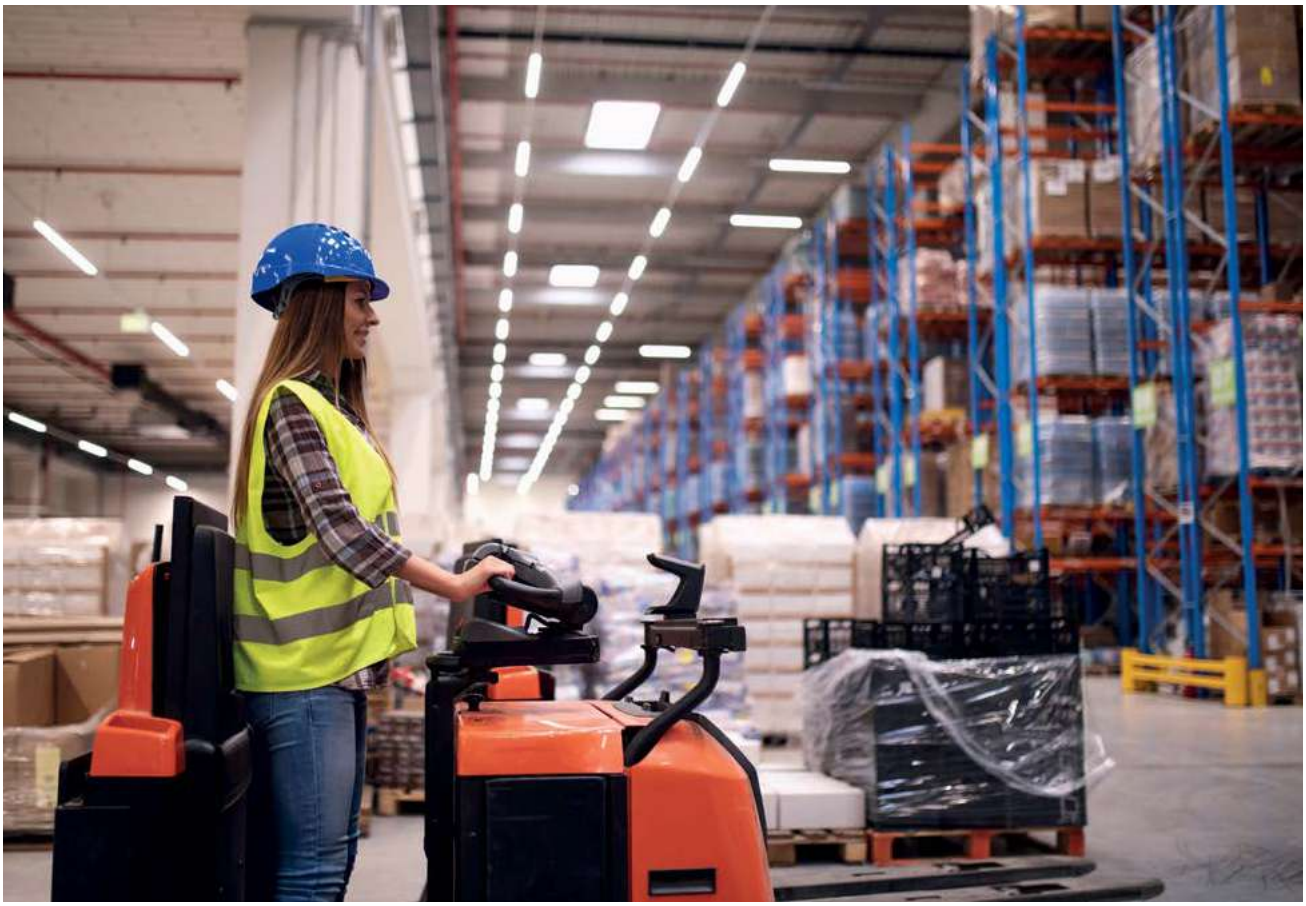
3. AN EFFECTIVE DOWNSTREAM SYSTEM

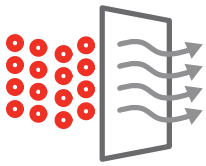
As mentioned in the applications section, an effective and reliable downstream system is essential to ensure consistent, high-quality air to power your operations. This consists of 3 vital components:



Dryers

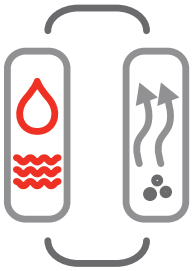
The first key component of any effective downstream system is a compressed air dryer, whose job it is to eliminate any moisture from your compressed air. As mentioned before, this is particularly important for powering any pneumatic equipment, including conveyors and air-powered dock levellers, thus making it vital for your distribution facility, as the presence of dry, clean air is essential! There are a variety of dryers on the market, including desiccant, which offers ultra-dry, high-quality air at a lower pressure dew point, and refrigerant dryers, which are better suited to general applications. If you wanted to utilise wasted compression heat, there are also heat of compression (HOC) dryers, which are arguably the most energy-efficient on the market! For powering any pneumatic tools, we'd typically recommend a desiccant dryer due to its effectiveness at removing moisture and producing ultra-dry air! However, we'd also recommend refrigerant dryers for distribution centres due to their ability to reduce energy consumption and minimise air loss.





Filtration System

Another key component is a highly efficient filtration system that can remove contaminants and impurities such as dust, oil, and moisture from your compressed air. Again, this is important for powering pneumatic machinery, as this application typically requires ISO Class 0 standard air. By implementing a filtration system, you can maximise air quality and the efficiency of your distribution centre's processes and applications.



Condensate Management & Treatment

Condensate is a natural by-product of compressing air, but due to the mixture of oil and water, it is typically considered hazardous industrial waste. Therefore, the safe and environmental management and removal of condensate is essential. The most effective way to deal with condensate is by implementing a condensate management unit which contains condensate or zero-loss drains. The drains will transfer the condensate into an oil water separator, which will separate out the oil from the water. The drains are generally equipped with timers, which will then remove the condensate from your oil water separator and out of your compressed air system. This can then be disposed of in a manner that adheres to strict industry and environmental regulations. Condensate removal ensures higher-quality compressed air, which is essential for powering pneumatic tools and machinery.

4. HEAT RECOVERY

Heat is another natural by-product of the air compression process, but did you know that up to 90% of the wasted heat generated by your compressed air system can actually be recovered and redistributed around your facility? By implementing a reliable heat recovery system, you can repurpose wasted heat to heat your facility or any process water you may need. This will help you operate more cost- and energy-efficiently.

5. MANAGEMENT & MONITORING

Unfortunately, understanding your air compressor can often feel like a bit of a guessing game, which is why monitoring and managing it simply is such an easy way to maximise your efficiency. Compressor controllers are one solution here, as they allow you to adjust pressure and flow rates to prevent inefficiency and wasted energy. A lot of the applications in your distribution centre that require compressed air involve pressure, but the more pressure you need, the more energy you consume, and the more your costs will go up. This is why a compressor controller is ideal, to ensure you only use what you need when you need it!

At Ingersoll Rand, we also offer a 24/7 remote monitoring solution, which is discussed more in the Service and Maintenance part of this white paper. This is another effective way in which you can monitor your compressed air system to ensure you're operating at your most efficient!

6. WARRANTIES, OEM PARTS & MAINTENANCE

Understanding the warranties, OEM parts and accessories, and maintenance plans available to you is vital to protecting your investment and preventing unnecessary costs! For example, in the Service and Maintenance section of this White Paper, you can discover more about our suite of CARE™ maintenance plans. When discussing the options with our partners, we place particular emphasis on discovering more about their exact application requirements in order to better align one of our plans with their industry needs. Whether you are in need of total asset management, a warranty, OEM parts and accessories, remote monitoring or scheduled predictive maintenance, we have all the experience and tools to provide you with the services you need! Correctly looking after your compressed air system is essential to maximise your efficiency, equipment longevity and air quality and keep your costs and energy consumption down!

Sizing Up Your Needs - Ingersoll Rand's Portfolio Of Logistics And Warehouse Solutions

Selecting The Right Air Compressor

Various applications used in distribution centres call for different types of air compressors. The key, as mentioned, is ensuring you select the right unit for your logistics and warehousing facility, making sure that it meets your compressed air demand whilst also keeping maintenance and operating costs low.

Let's face it, powering distribution centre equipment is absolutely crucial to getting the daily work done and making your facility operate at full capacity. Choosing an air compressor for a specific application requires careful consideration of several things, including intended use, performance specifications and available resources.

The common misconception regarding powering pneumatic conveyors or air-powered levellers in distribution centres and warehouses is that more horsepower equates to more compressed air output. In fact, today's air compressor technology is highly advanced, so if sized properly for the application, an air compressor can produce the same overall power with less horsepower. For example, the Next Generation R Series 11-22 kW machine that delivers from 15 to 30 horsepower can produce 18% more airflow than its predecessor with the same horsepower capacity.

Depending on the size of your distribution centre and the pressure demands of your equipment on the production line, the type of air compressor you require will vary. Whatever the equipment, when building your compressed air system, there are a few questions to consider:

- How much air flow is required?
- What are the pressure requirements?
- Do you need clean or dry air?
- What filters or dryers do you need?
- How many hours a day will you need your air compressor to operate for? Will this use be constant or intermittent?
- Will your demand fluctuate?
- Are you going to increase the scope of your operations in the near future?

Our Compressed Air Portfolio

Ingersoll Rand has long been a leader in providing compressed air solutions for various industries. Renowned for its high reliability and customer-oriented mindset, the company has an extensive product portfolio and application know-how, which allows it to deliver the highest quality, reliability and dependable performance.

Managers of distribution centres, logistics facilities and warehouses rely on technologically advanced equipment and don't want to gamble with poor compressed air quality. To help them achieve this goal, Ingersoll Rand offers products that will ensure maximum productivity and the longest service life possible.

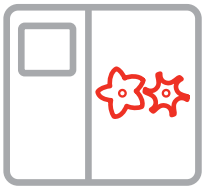
Oil-Free Compressors

We have an extensive range of oil-free air compressors ideal for producing a continuous flow of high-quality, clean, and dry air to power your pneumatic and air-powered equipment. For more information on the specific models best suited to the logistics and warehousing industry, please feel free to contact one of our expert team. An example of our expert oil-free solutions is the E-Series 15 - 37 kW (20 – 50 hp) Rotary Screw Compressors that guarantees 100% oil-free and silicone-free air. These solutions offer a lower total cost of ownership, enhanced reliability with a robust design and maximised uptime and ease of use.

Oil-Flooded Compressors

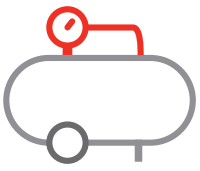
Contact Cooled Screw Compressors

Our contact cooled systems are available in 7.5 - 11 kW (10 – 15 hp), 15 - 22 kW (20 – 30 hp) & 22, 26 & 30 kW (30, 35 & 40 hp) models, with fixed & variable speed systems available. All of these systems boast a small footprint and integrated design, with high-performance airends for optimal performance and efficiency.



Next Generation R-Series Oil-Flooded Rotary Screw Compressor 11-22 kW (15 - 30 hp)

The R-Series rotary screw compressor is characterised by a low total cost of ownership due to its reliable components and industry-leading capacity. Its expert V-Shield™ technology translates to an integrated, leak-free design. Coupled with the PartsCARE™ service program, longer compressor life is also guaranteed.

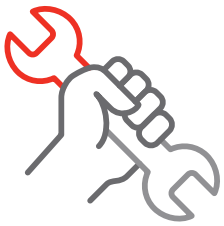


Aluminium Piston Compressors

Our new aluminium piston compressors are also an ideal choice for distribution centres. Ranging from 1.5 kW - 7.5 kW (2 - 10 hp) and available in Belt, Silenced, Petrol, and Tandem models, these systems are made in Europe and, therefore, comply with all relevant EU standards. They offer high performance and reliability, helping your logistics and warehousing facility operate continuously at its most efficient.

Air Treatment

We offer an extensive portfolio of air treatment and downstream equipment, from filtration systems and desiccant and refrigerated dryers to heat recovery and condensate management systems. This ensures you have everything you need to maximise your air quality!



Service And Maintenance Programs

There are many applications in which you will require high-quality compressed air in your distribution centre. You also now understand how to build an efficient compressed air system that allows your logistics and warehousing facility to operate at maximum productivity. Now it's time to look at how to service and maintain your equipment to avoid unplanned, unbudgeted downtime and production interruptions.

Lower cost of ownership, quality results, increased uptime, and efficient energy use all add up to peace of mind.

PackageCARE™: We Protect You

- The greatest value for asset management
- Transfer operational risk for up to 10 years
- Includes all scheduled maintenance
- Predictive and analytical tools prevent production interruptions

PlannedCARE™: We Help You

- Predictive, on-time planned maintenance
- Preventative diagnostics to catch potential problems
- Up to five-year coverage on major airend components in new rotary compressors

Performance Services

Our performance services include electronic, air leak, and system assessments. Whether you need to manage costs, increase reliability, or plan for future growth, our portfolio of assessment tools provides you with detailed diagnostics that give you the proper insights to help lower the total cost of ownership.

System Automation

System assessments often identify waste caused by a lack of adequate controls. Our suite of system automation solutions lowers energy costs and stability pressure.

24/7 Remote Monitoring With The Helix™ Connected Platform

Developed to maximize uptime and peace of mind, the Helix™ Connected Platform from Ingersoll Rand gives you real-time monitoring that provides visibility into machine functionality and equips you to operate at maximum efficiency. Your team will have direct access anytime to Helix™ insights and diagnostic reporting that can help prevent lost productivity from unforeseen breakdowns. Maintenance scheduling is simplified thanks to proactive service reminders and automated communications that help to preserve machine health.

Reliability for Life

- Generate air in any environment. We offer solutions that operate indoors and outdoors in compact spaces and extreme temperatures.
- Enjoy increased oversight with controls you can access remotely. Regulate your air use with compressor controls that monitor critical operating parameters and adapt the system to prevent downtime.
- Designed for easy serviceability and maintenance, our compressors minimize the total cost of ownership.
- An extensive catalogue of genuine OEM consumable and replacement parts and accessories are available to you to make service and maintenance easy and cost-effective. OEM parts and accessories are important as they guarantee a perfect fit and function to the highest quality standards.

Protect Your Investment With Ongoing Preventative Maintenance

When it comes to distribution centres, original equipment manufacturer (OEM) parts are an operator's best choice to maintain maximum reliability and performance. Non-standard parts can expose equipment to unnecessary wear and tear, leading to downtime and higher operating costs.

If you want to protect your investment and the performance and longevity of your equipment, make sure to invest in quality parts to keep it running. Ingersoll Rand has a complete offering of maintenance and OEM-quality compressor parts, including lubricants, maintenance kits, replacement parts, filtration and condensation management, complemented by the expertise to keep your logistics or warehousing facility running.

Find A Partner You Can Trust...
Global Service and Support Network

Renowned for its market-leading reliability, quality, and untroubled performance, Ingersoll Rand brings over 160 years of innovative solutions to the compressed air market. In addition to a comprehensive portfolio of best-in-class air compressors, Ingersoll Rand offers various maintenance programs as well as air compressor repairs that use OEM genuine components.

Depending on your distribution centre's needs, Ingersoll Rand offers a range of service packages, from a comprehensive service program that takes the operational risk away from the customer. We also offer a simple package that includes delivering the right part to you at the right time. Choosing the right package that provides the best, most efficient support to keep your business up and running requires careful consideration. To save our customers' time, our engineers will perform a deep analysis to help determine which maintenance plan is the best for your specific industry and application needs.

It All Adds up to Peace of Mind

Lower Cost of Ownership

Our service programs provide the most cost-effective solutions based on your customised maintenance strategy.

Quality Results

Ingersoll Rand factory-trained service technicians are backed by more than 149 years of industry experience.

Increased Uptime

Service programs help decrease unplanned downtime and costly production interruptions.

Efficient Energy Use

Peak system efficiency is achieved through properly performed maintenance and inspection.

Peace of Mind

Our world-class services will help you achieve the results you need, while you focus on what's important to your business.

There's a lot riding on the quality of your air. Let Ingersoll Rand help you get it right!

Ingersoll Rand's Wide Portfolio of Air Compressors

Ingersoll Rand provides a wide range of high-quality, low-maintenance commercial and industrial air compressors to fit every application. Our engineers can provide you with a bespoke solution and the support you need to keep your logistics or warehousing facility working at maximum efficiency.

Please visit and partner with us!

About Ingersoll Rand Inc.

Ingersoll Rand Inc. (NYSE:IR), driven by an entrepreneurial spirit and ownership mindset, is dedicated to helping make life better for our employees, customers and communities. Customers lean on us for our technology-driven excellence in mission-critical flow creation and industrial solutions across 40+ respected brands where our products and services excel in the most complex and harsh conditions. Our employees develop customers for life through their daily commitment to expertise, productivity and efficiency. For more information, visit irco.com

ingersollrand.com

Member of Pneurop

Ingersoll Rand compressors are not designed, intended or approved for breathing air applications. Ingersoll Rand does not approve specialized equipment for breathing air applications and assumes no responsibility or liability for compressors used for breathing air service.

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