

3-STEP MAINTENANCE CONTROL FOR COMPRESSED AIR PIPING SYSTEMS

OPTIMIZATION GUIDE FOR THE MAINTENANCE MANAGER



TOPRING
Compressed air solutions

Compressed air represents about 10% of the total electricity consumption in the industry. A properly planned, optimized compressed air system will be effective and will limit compressed air production and distribution costs. In order to maintain the safety and performance of the piping system, and pneumatic tools and equipment, a routine maintenance control must be done regularly by the compressed air manager.

In addition to this guide, reading the white paper “The Basics of Compressed Air” which outlines the main optimization measures, is strongly recommended.



“Most facilities can easily save 10-20% of their compressed air energy costs through routine maintenance such as the fixing of air leaks, lowering air pressure, and replacing clogged filters.”

– Natural Resources Canada, 2015

Why is it important to perform a maintenance check on the compressed air system?

- > To maintain the efficiency, performance and safety of the compressed air system, and of the pneumatic tools and equipment
- > To limit the costs associated with the production and distribution of compressed air (the fixing of air leaks)
- > To stay energy efficient over the years

Useful Tip

Take care and service all compressed air system equipment in accordance with the manufacturers’ specifications. In order to make sure that your compressed air system is energy efficient, do not hesitate to perform checks more frequently than what is initially recommended.



HOW TO PROCEED TO THE MAINTENANCE CONTROL

Use the list of control steps, found in the next few pages, as your working tool. Prior to starting, make sure you follow this procedure to help you in your inspection and regular annual maintenance control.

Prior to proceed to the maintenance control

- Read the checklist in its entirety
- Determine what steps you plan to take in-house and which ones need to be taken by an external expert
- Set a date to carry out the checkup



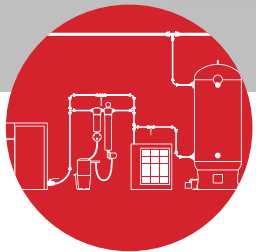
How to proceed to the maintenance control

- Check the pressure at the compressor's outlet (see pressure gauge reading)
- Check the static pressure at the point of application using a pressure reading tool (see **TOPRING** product 62.015)
 - If the difference is greater than 10%, it means that there is excessive pressure loss in the system (energy costs and loss of efficiency).
- Proceed with the 3-step maintenance control in order to identify the sources of pressure loss
 - Carry out the inspection going upstream, from the tool toward the compressor, and use the complementary “Air Leak Report” (See Appendix p.9)
- Order all the material needed for the reparation, such as filtration elements, couplers and plugs

OPTIMIZATION GUIDE FOR THE MAINTENANCE MANAGER

To help you optimize your compressed air installation and, thus, improve the energy efficiency and performance of your pneumatic tools and equipment, here is a 3-step maintenance control.

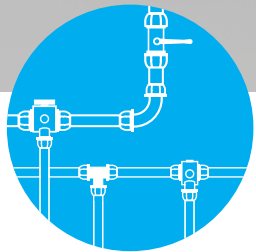
Easily identify the product groups associated with each step of the inspection:



Compressed
air treatment

STEP 3

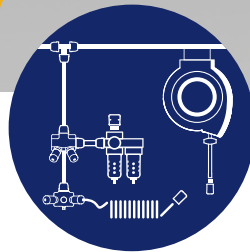
Air exiting the
compressor



Compressed air
piping systems

STEP 2

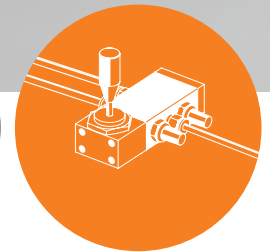
Main piping system



Air preparation,
hoses
and couplers



Compressed
air tools



Fluid power

STEP 1

Between the point
of application
and the piping system

1

INSPECTION BETWEEN THE POINT OF APPLICATION AND THE PIPING SYSTEM

Internal	External	✓ Actions	Notes
<input type="checkbox"/>	<input type="checkbox"/>	<p>1.1 Leak detection</p> <ul style="list-style-type: none"> <input type="checkbox"/> Perform an auditory check to detect leaks at the level of the FRLs, hoses, couplers, tools and equipment, up to the compressed air piping system <input type="checkbox"/> Use the “Air Leak Report” guide available in Appendix (p.9) 	
<input type="checkbox"/>	<input type="checkbox"/>	<p>1.2 Inspection of the state of wear of the FRLs</p> <ul style="list-style-type: none"> <input type="checkbox"/> Check for any noticeable air leak <input type="checkbox"/> Make sure that the percentage of pressure loss is acceptable <input type="checkbox"/> That filtering elements are not saturated (the differential pressure indicator is in the green zone) <input type="checkbox"/> That bowls are in good condition (no cracks, no impurities) <input type="checkbox"/> That regulators and gauges are functional <input type="checkbox"/> That the oil level in the lubricators is adequate 	
<input type="checkbox"/>	<input type="checkbox"/>	<p>1.3 Inspection of the state of wear of quick couplers, plugs and fittings</p> <ul style="list-style-type: none"> <input type="checkbox"/> Check for any noticeable air leaks <input type="checkbox"/> Make sure that couplers do not show sign of wear (no sharp edge, no rust) <input type="checkbox"/> That the connection/disconnection is easy (change for safety couplers) <input type="checkbox"/> That there is sufficient airflow (if needed, change for a fitting with a higher SCFM) 	
<input type="checkbox"/>	<input type="checkbox"/>	<p>1.4 Inspection of the state of wear of the hoses and reels</p> <ul style="list-style-type: none"> <input type="checkbox"/> Identify noticeable air leaks <input type="checkbox"/> Check the tension of the reels (watch the video “Spring Tension Adjustment” on TOPRING.com) <input type="checkbox"/> Check the condition of the hoses (no apparent wear or swelling/bubble) – repair if necessary or choose a hose that’s better suited to the environment <input type="checkbox"/> Check the length and diameter of the hoses (if needed, choose a hose with a larger diameter or a shorter one for greater flow) <input type="checkbox"/> Install anti-hose whip HOSEGUARD safety valves (see series 58) 	

Step 1 page 1 of 2

Carried out by: _____ Date: _____ (DD) _____ (MM) _____ (YYYY)

1

INSPECTION BETWEEN THE POINT OF APPLICATION AND THE PIPING SYSTEM

Internal	External	✓ Actions	Notes
<input type="checkbox"/>	<input type="checkbox"/>	<p>1.5 Inspection of the state of wear of pneumatic tools</p> <ul style="list-style-type: none"> <input type="checkbox"/> Identify noticeable air leaks <input type="checkbox"/> Look for rust <input type="checkbox"/> Replace worn out or defective blow guns with safe, quiet or low-consumption blow guns <input type="checkbox"/> Repair or replace all worn out or faulty tools <input type="checkbox"/> Check the tool's working pressure (if needed, install an in-line regulator) 	
<input type="checkbox"/>	<input type="checkbox"/>	<p>1.6 Inspection of the state of wear of automation products (valves, cylinders, push-to-connect fittings, and pneumatic tubings)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Identify noticeable air leaks (at the level of the couplers, valves, cylinders, and of the mufflers) <input type="checkbox"/> Check the condition of the pneumatic tubings (not cracked) <input type="checkbox"/> Check the condition of the cylinders (firmly anchored, good rod alignment) 	
<input type="checkbox"/>	<input type="checkbox"/>	<p>1.7 Control of the new compressed air requirements</p> <ul style="list-style-type: none"> <input type="checkbox"/> Have new tools and equipment been installed in the past year? <input type="checkbox"/> Is the capacity of the network and connection lines (including FRLs, hoses, reels and fittings) still sufficient? <input type="checkbox"/> Are there any new air quality requirements? 	

Step 2 page 2 of 2

Carried out by: _____ Date: ____ (DD) ____ (MM) ____ (YYYY)

2

INSPECTION OF THE MAIN PIPING SYSTEM

Internal	External	✓ Actions	Notes
<input type="checkbox"/>	<input type="checkbox"/>	<p>2.1 Leak detection</p> <p><input type="checkbox"/> Perform an auditory check to detect leaks in the main piping system and drops (couplers, elbows, unions, manifolds)</p> <p><input type="checkbox"/> Use the “Air Leak Report” guide available in Appendix (p.9)</p>	
<input type="checkbox"/>	<input type="checkbox"/>	<p>2.2 Connection between the compressor and the main pipes</p> <p><input type="checkbox"/> Make sure that there is a flexible anti-vibration hose between the compressor and the compressed air system</p>	
<input type="checkbox"/>	<input type="checkbox"/>	<p>2.3 Configuration of the pipes</p> <p><input type="checkbox"/> Prioritize a constant size of piping diameter (to avoid pressure loss due to throttling)</p> <p><input type="checkbox"/> Prioritize a closed-loop network (see the introduction to compressed air piping systems at the beginning of group 2 in the TOPRING catalogue)</p> <p><input type="checkbox"/> Install ball valves to enable isolating sections of the network (safety Lockout ball valves ensure that air-powered equipment is safe to service)</p>	
<input type="checkbox"/>	<input type="checkbox"/>	<p>2.4 Water or rust presence</p> <p><input type="checkbox"/> Make sure that there is a condensate drain on each service drop and end of line</p>	

Carried out by: _____ Date: ____ (DD) ____ (MM) ____ (YYYY)

3

QUALITY CONTROL OF THE AIR EXITING THE COMPRESSOR (CONDENSATE TREATMENT)

Internal	External	✓ Actions	Notes
<input type="checkbox"/>	<input type="checkbox"/>	<p>3.1 Leak detection</p> <p><input type="checkbox"/> Perform an auditory check to detect leaks between the compressor and the main piping system</p> <p><input type="checkbox"/> Use the “Air Leak Report” guide available in Appendix (p.9)</p>	
<input type="checkbox"/>	<input type="checkbox"/>	<p>3.2 Inspection of the main filtration system</p> <p><input type="checkbox"/> Are there any new air quality requirements?</p> <p><input type="checkbox"/> Are the filters equipped with a drainage system and connected to a water/oil separator?</p> <p><input type="checkbox"/> Make sure that the filtration elements are not saturated</p>	
<input type="checkbox"/>	<input type="checkbox"/>	<p>3.3 Inspection of the “zero air loss” automatic drains</p> <p><input type="checkbox"/> Make sure that there are “zero air loss” automatic drains installed at the following locations:</p> <ul style="list-style-type: none"> <input type="checkbox"/> – Compressor <input type="checkbox"/> – Water separator <input type="checkbox"/> – Refrigerant air dryer <input type="checkbox"/> – Compressed air filters <input type="checkbox"/> – Compressed air tank 	
<input type="checkbox"/>	<input type="checkbox"/>	<p>3.4 Inspection of the compressed air filters</p> <p><input type="checkbox"/> Check that the filtering elements are in good condition (not saturated)</p> <p><input type="checkbox"/> Check that the elements are appropriate for the air quality required (see series 53)</p>	
<input type="checkbox"/>	<input type="checkbox"/>	<p>3.5 Inspection of the water/oil separator</p> <p><input type="checkbox"/> Make sure that all the elements collecting condensates are connected to the separator</p> <p><input type="checkbox"/> Check that the element are in good condition (not saturated) and that condensates are properly treated</p>	

Carried out by: _____ Date: _____ (DD) _____ (MM) _____ (YYYY)

APPENDIX – AIR LEAK REPORT

Carried out by: _____ Date: ____ (DD) ____ (MM) ____ (YYYY)

No	Compressor Room	Location/ Leak Site	Leak Description	Seriousness of the Problem		Potential Risks/ Safety	Repair Period Planned		Date leak is repaired
				High	Moderate		Low	Active (ON)	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	
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				High	Moderate	Low	Active (ON)	Shut down (OFF)	

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				High	Moderate		Low	High	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	
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				High	Moderate	Low	Active (ON)	Shut down (OFF)	

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				High	Moderate	Low	Active (ON)	Shut down (OFF)	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	
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				High	Moderate	Low	Active (ON)	Shut down (OFF)	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	
				High	Moderate	Low	Active (ON)	Shut down (OFF)	



WE CAN HELP YOU WITH YOUR COMPRESSED AIR PIPING SYSTEM

For technical assistance, please contact a technical advisor by calling 1 800 263-8677 or emailing solutions@topring.ca

