

# Monitoring oil level in reservoirs for lubricated pressurized air

Adding oil to pressurized air is essential for several reasons, primarily related to the maintenance and performance of pneumatic tools and systems.

Here's why it's necessary:

- 1. Lubrication:** The primary reason for adding oil to pressurized air is to lubricate the internal components of pneumatic tools and equipment. These tools often have moving parts, such as pistons, cylinders, and valves, which require lubrication to reduce friction, prevent wear, and ensure smooth operation.
- 2. Corrosion Protection:** Oil in the pressurized air can help protect metal components from rust and corrosion, especially in moist environments. This is critical for extending the lifespan of the equipment.
- 3. Sealing:** Oil can help create a better seal in some pneumatic systems, particularly air cylinders, by filling small gaps and ensuring the pressurized air doesn't leak. This improves the efficiency of the system.
- 4. Cooling:** In some cases, oil can help dissipate heat generated by the friction of moving parts within the pneumatic tool. This helps in maintaining optimal operating temperatures and prevents overheating.
- 5. Contaminant Control:** Oil can also trap and carry away tiny particles of dirt or debris that might be present in the air or generated within the system, reducing the risk of damage to delicate components.



In short, adding oil to pressurized air helps maintain the efficiency, reliability, and longevity of pneumatic systems by providing essential lubrication, protecting against corrosion, improving sealing, aiding in cooling, and controlling contaminants.

## Challenge

In lubricated pressurized air systems, multiple oil reservoirs supply oil droplets across the factory. Monitoring these reservoirs through manual inspection is time-consuming, and if a reservoir runs dry before the next inspection, it risks damaging components and causing costly breakdowns.

## Solution

The Neuron Liquid-Level Detector is designed to solve this issue by providing a reliable method to monitor oil levels in lubricator reservoirs. This binary sensor – installed at the bottom of each reservoir – detects whether the liquid is covering the sensor surface. If the oil level drops below the sensor, an alarm is triggered, alerting personnel to replenish the oil in that specific reservoir before any damage occurs.

## Return on Investment (ROI) Calculation

Total Investment: €13,448

### Operational Details:

- Number of Lubricators: 30
- Manual Measurements per Month: 30
- Average Time per Measurement: 0.25 hours
- Labour Costs per Hour: €70
- Estimated Cost of Component Breakdown: €3,000
- Breakdown Frequency per Year Due to Unexpected Loss of Lubrication: 1

### Cost Savings:

- Labour Cost Savings:
  - Saved Labour Cost per Month: €525
  - Total Saved Labour Costs per Year: €6,300
  - Total Saved Labour Costs Over Five Years: €31,500
- Breakdown Cost Savings:
  - Total Saved Breakdown Costs per Year: €3,000
  - Total Saved Breakdown Costs Over Five Years: €15,000

### Total Cost Savings:

- Total Saved Costs per Year: €9,300
- Total Saved Costs Over Five Years: €46,500

### Return on Investment (ROI):

- One-Year ROI: -31% (Reflecting the initial investment cost compared to first-year savings)
- Five-Year ROI: 198% (Substantial return after the payback period, showcasing the long-term benefits)

## Payback Period:

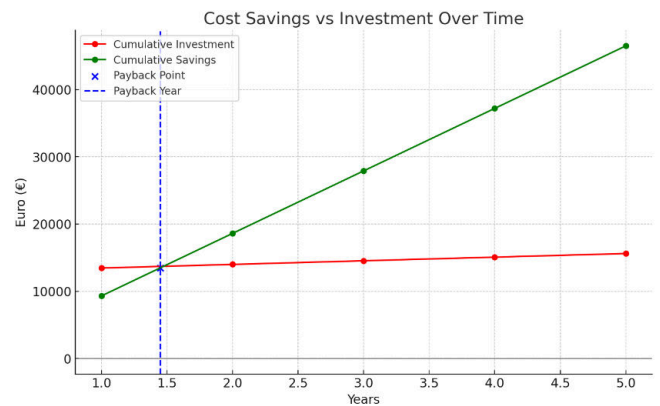
- **Payback Time:** 1.45 years, or approximately 528 days

## Annual Financial Overview:

- Year 1:
  - Total Cost: €13,448
  - Total Savings: €9,300
- Year 2 Onward:
  - Annual Cost: €540 (Subscription Fees)
  - Annual Savings: €9,300

This ROI calculation highlights the financial advantages of implementing the Neuron Liquid Level Detector system.

## Cost Savings vs. Investment Over Time:



This visual representation emphasizes the rapid return on investment, making the Neuron Liquid-Level Detector a cost-effective choice in the long run:

- The red line represents **Cumulative Investment**, including the initial and ongoing costs.
- The green line shows **Cumulative Savings** accrued through reduced labour and breakdown costs.
- The **Payback Point** is reached at approximately 1.45 years, where the savings exceed the investment.

## Key Benefits

- **Automated Monitoring:** No need for manual inspection of oil levels in pressurized air lubricator reservoirs.
- **Early Warnings:** Receive timely alerts when oil levels drop, preventing equipment damage.
- **Optimized Maintenance:** Streamlines workflows and reduces time spent on routine maintenance.

Our wireless sensor solution offers technical personnel an efficient and reliable method for asset monitoring. By continuously collecting data through our robust wireless sensors, you can proactively address potential issues, minimize production losses, and ensure your systems' safety and optimal performance.

Discover the benefits of our IoT solution and unlock the full potential of your assets.

## Products in use

- Neuron Liquid-Level Detector
- Neuron Cellular Gateway