

**A COMPLETE RANGE OF AIR DRYER CARTRIDGES
DESIGNED AND MANUFACTURED TO THE HIGHEST STANDARDS**

**WABCO
AIR DRYER CARTRIDGES**



| Application | WABCO Essential Cartridge | WABCO Standard Cartridge | WABCO Air System Protector | WABCO Air System Protector ^{INSERT} | WABCO Air System Protector ^{PLUS} |
|---|---------------------------|--------------------------|----------------------------|--|--|
| Long distance bus application (coaches) | × | × | × | × | × |
| Long distance truck application | × | × | × | × | × |
| Long distance truck/trailer application | × | × | × | × | × |
| Long distance special applications | × | × | × | × | × |
| City bus applications | | | × | × | × |
| "Last mile"/urban transportation | | | × | × | × |
| Off High Way | | | × | × | × |
| Urban services | | | | | × |
| Special/premium applications | | | | | × |

| Performance | | | | | |
|-------------------------------|---|----|----|----|-----|
| Drying performance | + | ++ | ++ | ++ | +++ |
| Oil separation efficiency | | | + | + | ++ |
| Aerosol separation efficiency | | | + | + | ++ |

| Details | | | | | |
|--|--------|----------------|---------------|---------------|---------------|
| M 39x1.5 | 14 bar | 432 410 222 7 | 432 410 020 2 | 432 901 223 2 | 432 410 244 2 |
| M 39x1.5 | 14 bar | | | 432 901 245 2 | 432 911 245 2 |
| M 39x1.5, special sealing ring DAF | 14 bar | | | 432 901 253 2 | |
| M 41x1.5 | 14 bar | 432 520 008 2* | | 432 901 246 2 | 432 911 246 2 |
| SG 41x1.5** | 14 bar | | | 432 901 002 2 | |
| M 41x2.0 | 14 bar | | | 432 901 251 2 | |
| M 42x1.5 | 20 bar | | 432 410 220 2 | | |
| G 1 1/4* | 14 bar | 432 415 220 7 | | | |
| G 1 1/4* | 14 bar | | 432 410 927 2 | 432 901 228 2 | 432 911 228 2 |
| Air System Protector ^{INSERT} | 15 bar | | | 432 901 500 2 | |

* reduced height (135 mm)
** special thread E-APU 2nd generation (MAN vehicles ≥ 2018)

| Recommended Service Interval (under normal conditions) | 1 Year | 2 Years | 2 Years | 2 Years | 3 Years |
|--|--------|---------|---------|---------|---------|
| | | | | | |

All cartridges applicable for mechanical and electronic air dryers.
Need more information? Ask your WABCO expert or visit us at: www.wabco-auto.com

THE RIGHT CARTRIDGE TO MEET YOUR REQUIREMENTS



WABCO Essential
For vehicles with low oil contamination

WABCO Standard

Air System Protector / Air System Protector^{INSERT}
For all vehicles with oil and aerosols contamination

Air System Protector^{PLUS}
For all vehicles with high air consumption and oil contamination

AIR QUALITY MATTERS

Air dryer cartridges from WABCO offer the most reliable protection for air brake systems.

Designed and manufactured in Germany to the highest quality standards, genuine WABCO air dryer cartridges are engineered to keep air brake systems operating at optimum levels of performance, helping to ensure vehicles stay on the road and out of the maintenance bay.

Choose Original WABCO cartridges

Every genuine WABCO part is made of high-grade materials and is rigorously tested before leaving our hands. Each is a product of WABCO's 150 year history of innovation and design excellence.

Every genuine WABCO cartridge supplied to aftermarket customers is manufactured to the same exacting quality standards as those provided to commercial vehicle manufacturers.

Information on WABCO products can be found in our Customer Centre (www.wabco-customercentre.com) by entering the product number in the "Search Products" field. Please contact your WABCO partner for further information: www.wabco-auto.com/Get-in-touch

ZF Friedrichshafen AG

ZF is a global technology company and supplies systems for passenger cars, commercial vehicles and industrial technology, enabling the next generation of mobility. ZF allows vehicles to see, think and act. In the four technology domains Vehicle Motion Control, Integrated Safety, Automated Driving, and Electric Mobility, ZF offers comprehensive solutions for established vehicle manufacturers and newly emerging transport and mobility service providers. ZF electrifies different kinds of vehicles. With its products, the company contributes to reducing emissions and protecting the climate.

ZF, which acquired WABCO Holdings Inc. on May 29, 2020, now has 162,000 employees worldwide with approximately 260 locations in 41 countries. In 2019, the two then-independent companies achieved sales of €36.5 billion (ZF) and \$3.4 billion (WABCO).

With the integration of WABCO, the leading global supplier of braking control systems and other advanced technologies that improve the safety, efficiency and connectivity of commercial vehicles ZF will create a new level of capability to pioneer the next generation of solutions and services for original equipment manufacturers and fleets globally. WABCO, with almost 12,000 people in 40 locations worldwide, will now operate under the ZF brand as its new Commercial Vehicle Control Systems division.

WABCO CARTRIDGE PORTFOLIO

HIGH QUALITY CARTRIDGES FOR HIGH QUALITY AIR



WABCO CARTRIDGE PORTFOLIO



WABCO cartridges are the most reliable and cost-effective choice on the market, promoting optimal functionality of the braking system and less vehicle time in the maintenance bay. A track record of excellence stretching back 20 years ensures every WABCO air dryer cartridge manufactured today will provide outstanding and reliable protection against humidity. WABCO air dryer cartridges use a premium desiccant to ensure superb performance and longevity.

CONVENTIONAL TECHNOLOGY



WABCO ESSENTIAL

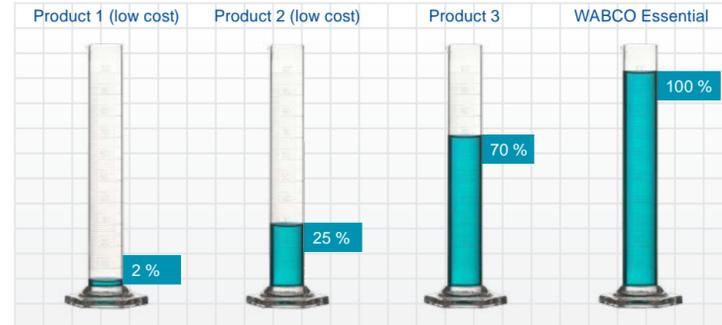
Our essential cartridge

The WABCO Essential cartridge meets WABCO's impeccably high performance standards and comes at a convenient value for the customer. The cartridge is developed to act under basic air drying requirements such as every day long distance operations.

Laboratory tests demonstrate the performance superiority of genuine WABCO Essential cartridge compared to low cost competition.

Choose WABCO Essential cartridge for applications that require exceptional value for money in everyday long distance driving conditions.

Drying performance



WABCO Cartridges separate 100% of water

Test conditions: Drying performance test rig acc. SAE J2384; 30 days, mechanical air dryer with regeneration tank of 6 liters, cut-in: 11 bar, cut-out: 12 bar



WABCO STANDARD

Setting performance standards

WABCO Standard cartridge delivers an instant performance enhancement as the first line of defense protecting a vehicle's air system. WABCO Standard cartridges prevent humid air filtering into the system protecting it from corrosion and freezing. As a result, the entire air system is kept operating safely and at peak performance.

Choose WABCO Standard cartridge for applications that require value for money and outstanding and reliable protection against humidity in everyday long distance driving conditions.

COALESCING TECHNOLOGY



WABCO AIR SYSTEM PROTECTOR

Capture oil particles without restricting of drying performance

Since launch in 2001, the WABCO Air System Protector has been the market leading cartridge. Used today on millions of vehicles, Air System Protector is a step forward from the standard cartridge, not only drying air but also separating out oil and fine aerosols. Separating 99.95 per cent of all contaminant particles from the airflow, Air System Protector ensures air braking systems retain optimal functionality throughout the long life of the cartridge.



WABCO AIR SYSTEM PROTECTOR^{INSERT}

High quality air dryer cartridge, for Volvo & Renault trucks

The Air System Protector^{INSERT} is a variant for electronic air processing units (APU) of Renault and Volvo vehicles. It has a unique hexagon bayonet shaped omnidirectional design which reduces installation time. Air System Protector^{INSERT} cartridge is 100% compatible with Volvo/Renault electronic air processing units (APU) and offers easy, perfect-fit installation and optimal performance.

Superior design

By placing its coalescent filter in the base of the cartridge, Air System Protector can hold a similar amount of desiccant to the standard model, offering the same great level of protection from humidity, but with an extra layer of defence.

A decade of market leadership and proven performance, the preferred choice of original equipment customers

The WABCO Air System Protector is a smart, efficient coalescing cartridge providing excellent oil separation while keeping drying capacity at peak levels. It betters the capabilities of rival filters, even at the end of its recommended service life. Air System Protector is the cartridge of choice for most European commercial vehicle manufacturers who specify it based on its proven level of performance over the last ten years.

Drying performance over a recommended cartridge lifecycle

Containing similar levels of desiccant to a standard cartridge, WABCO Air System Protector combines robust protection from oil-ingress with excellent drying performance. Even towards the end of its recommended life, a WABCO Air System Protector cartridge provides superior drying performance than newly installed rivals.

Oil separation performance

Testing carried out under laboratory conditions demonstrates the performance difference between WABCO coalescing cartridges and those of alternative suppliers. Only a high-quality coalescing cartridge can protect an air system against the ingress of oil particles.

In modern vehicles even low quantities of oil can destroy valves and lead to system failure and downtime. Tests to replicate one year of service demonstrate the amount of oil breaching the barriers of generic cartridge brands.

Choose WABCO Air System Protector for applications that require vehicles to operate safely and efficiently under demanding driving conditions.



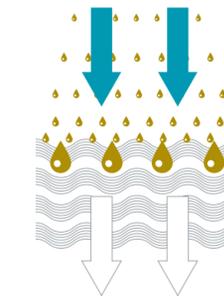
WABCO AIR SYSTEM PROTECTOR^{PLUS}

Raising the bar for cartridge performance

Building on the enormous success of the Air System Protector Cartridge, WABCO's latest generation of cartridges takes air system protection to a whole new level. The Air System Protector^{PLUS} sets new performance standards for the separation of oil and aerosols, outperforming every other cartridge available today. Additionally, under normal operating conditions it has a recommended exchange interval of three years.

Choose WABCO Air System Protector^{PLUS} for vehicles operating in challenging conditions, requiring protection from brake failure between extended service intervals.

COALESCING TECHNOLOGY EXPLAINED



- Capturing aerosols
- Coalescing effect merging fine aerosols into compact droplets
- Saturated filter layers can cause excess oil which will seep into the subsequent filter layers
- Clean air droplets are prevented from penetrating the final barrier layers

WABCO Air System Protector separates an additional 99.95% of all particles

Drying performance (litres/cycle)



Test conditions: Lifetime reproduced at compressor and drying performance test as described previously.

Oil particles filtration performance



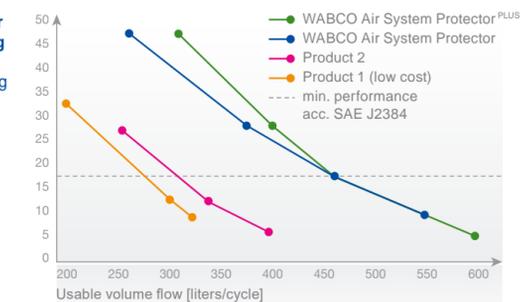
Test conditions: 704 cm³-two-cylinder-compressor at high temperature setting, 12.5 bar and 50% duty cycle; calculation based on aerosol measurement downstream the air-dryer

A LOT OF TECHNOLOGY IN A SMALL SPACE



- Intelligent design frees 20 per cent more space, increasing the amount of available desiccant, and thus improving drying performance
- Two distinct desiccant layers with individual humidity-capture characteristics to optimise drying performance
- Revolutionary double-filter technology to deal effectively with both large oil droplets and finest aerosols

Dew point depression to 22°C [K]



Test conditions: Drying performance test rig of coalescing cartridges acc. SAE J2384; mechanical air dryer with regeneration tank of 6 liters, cut-in: 11 bar, cut-out: 12 bar