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# IPETRONIK

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## **IPecompressor test bench**

Test bench solutions from IPETec

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# INTRODUCTION

- ▶ Designed for testing automotive compressors
- ▶ Test bench is flexible and used for a large range of different test applications
- ▶ The test bench allows compressor manufacturers to easily validate new prototypes
- ▶ High flexibility and repeatability to compare different prototype versions and benchmarking
- ▶ Test bench supports a variety of refrigerants:  
R744 / R134a / R1234yf

Test item:  
Compressor



# WIDE RANGE OF TEST APPLICATIONS

▶ RAFFER –  
Endurance &  
Fatigue Testing

▶ NVH –  
Vibration & Gas  
Pulsation Testing

▶ COP –  
Performance &  
Efficiency Testing



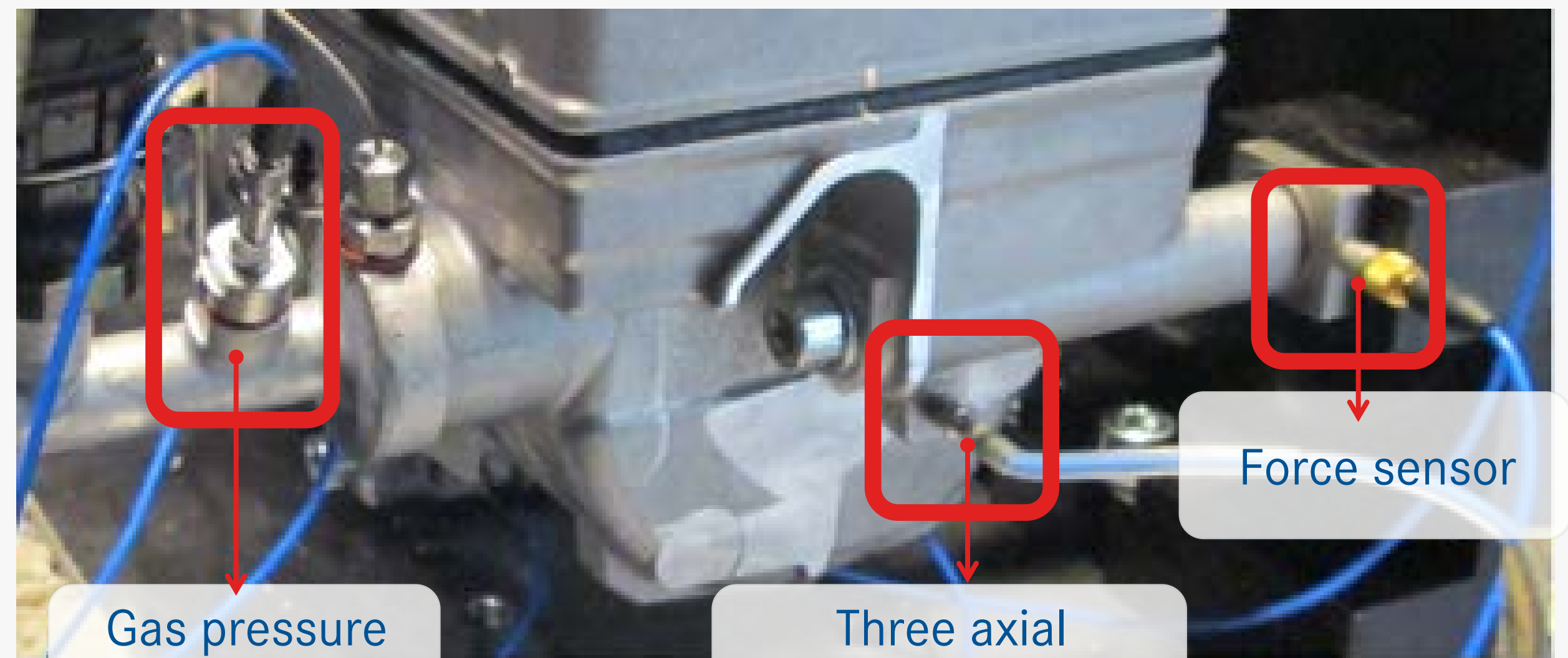
# NVH: VIBRATION & PULSATION TESTS

## OBJECTIVE:

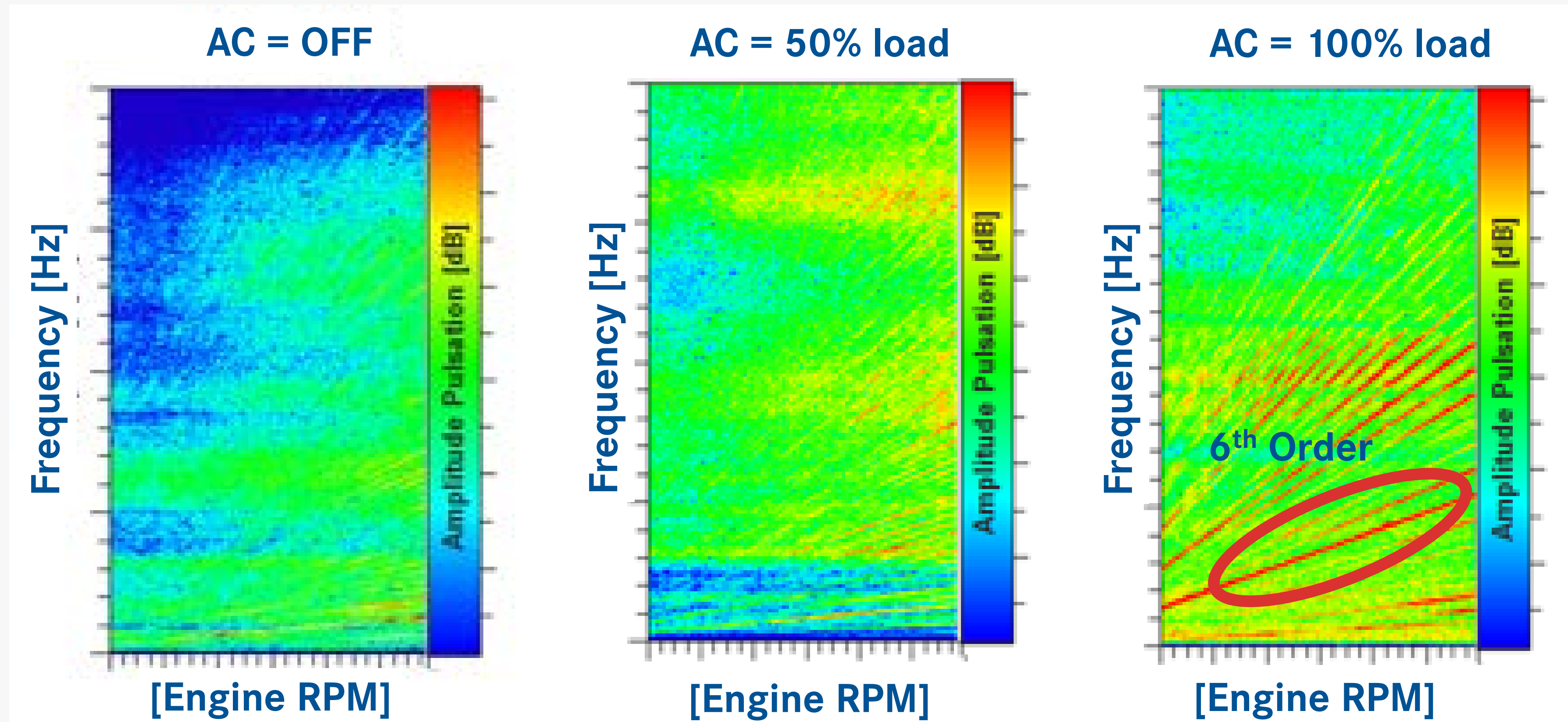
Analyze the acoustic impact of compressor noise on passengers as well as vibrations & forces to the overall vehicle structure

▶ Low and high pressure gas pulsation measurements

▶ Vibration and force measurements



# NVH: VIBRATIONS & PULSATION TESTS



Campbell diagram indicating frequency ranges and amplitudes over RPM.

# COP: EFFICIENCY TESTS

## OBJECTIVE:

Optimize compressors and the HVAC circuit energy efficiency at various load levels with a very high repeatability

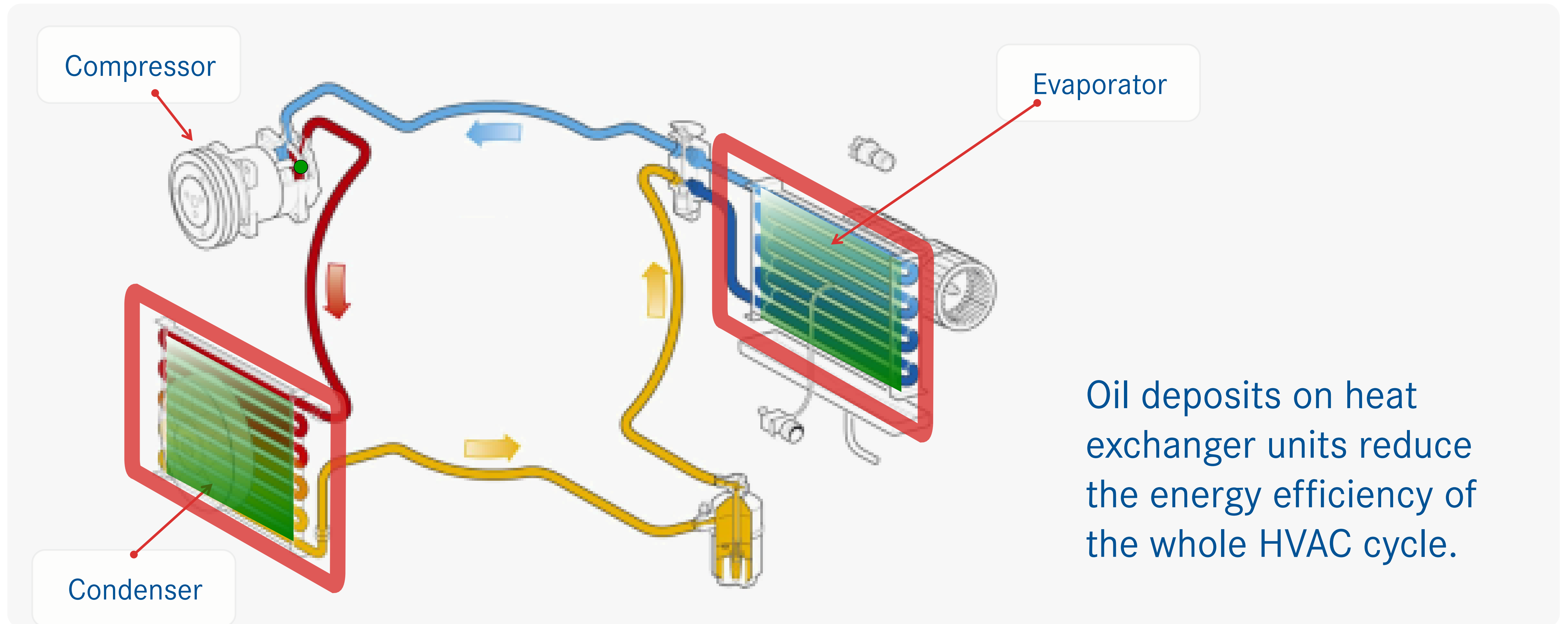
▶ VDA 30 point matrix test / factory acceptance test

▶ COP - Coefficient of performance indicator

▶ OCR - Oil Circulation Ratio measurement



# OCR: OIL CIRCULATION RATIO



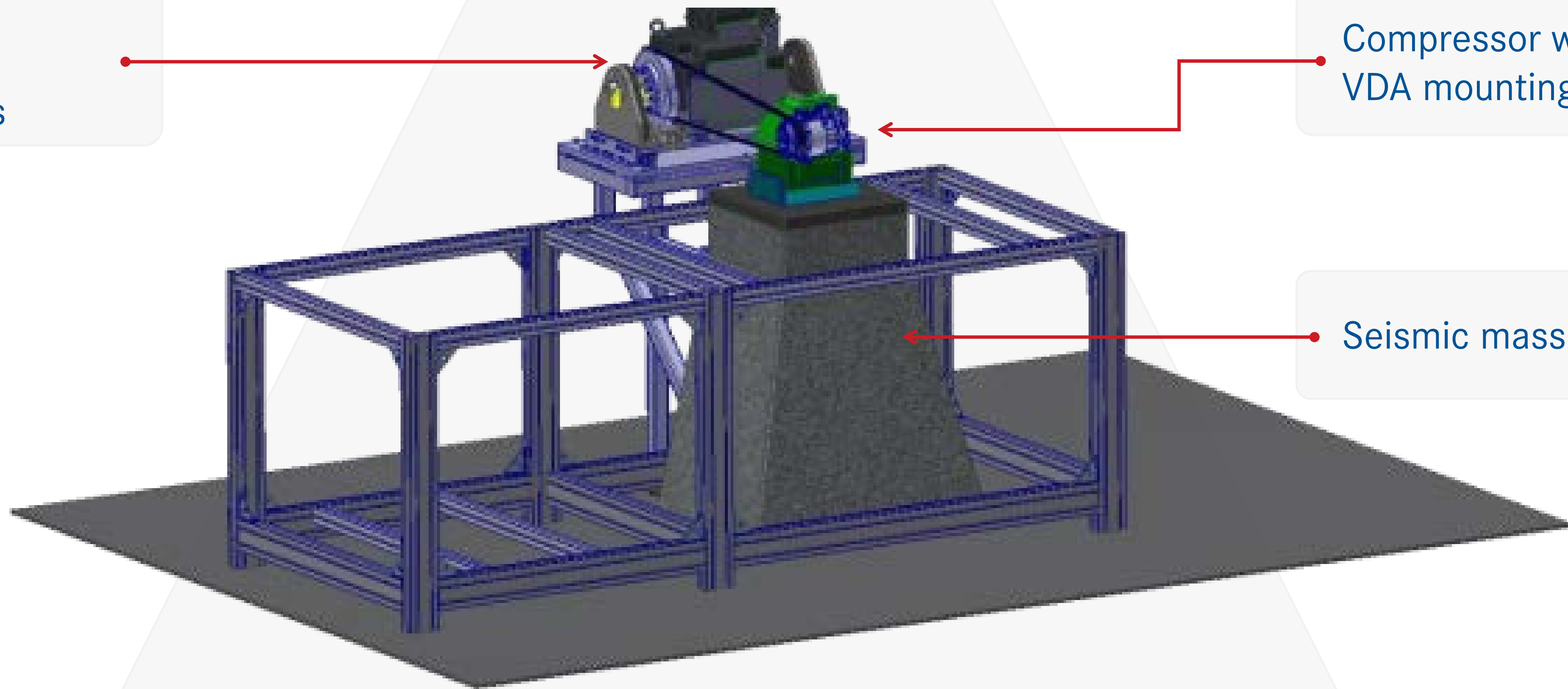
Oil deposits on heat exchanger units reduce the energy efficiency of the whole HVAC cycle.

# COMPRESSOR TEST BENCH OVERVIEW

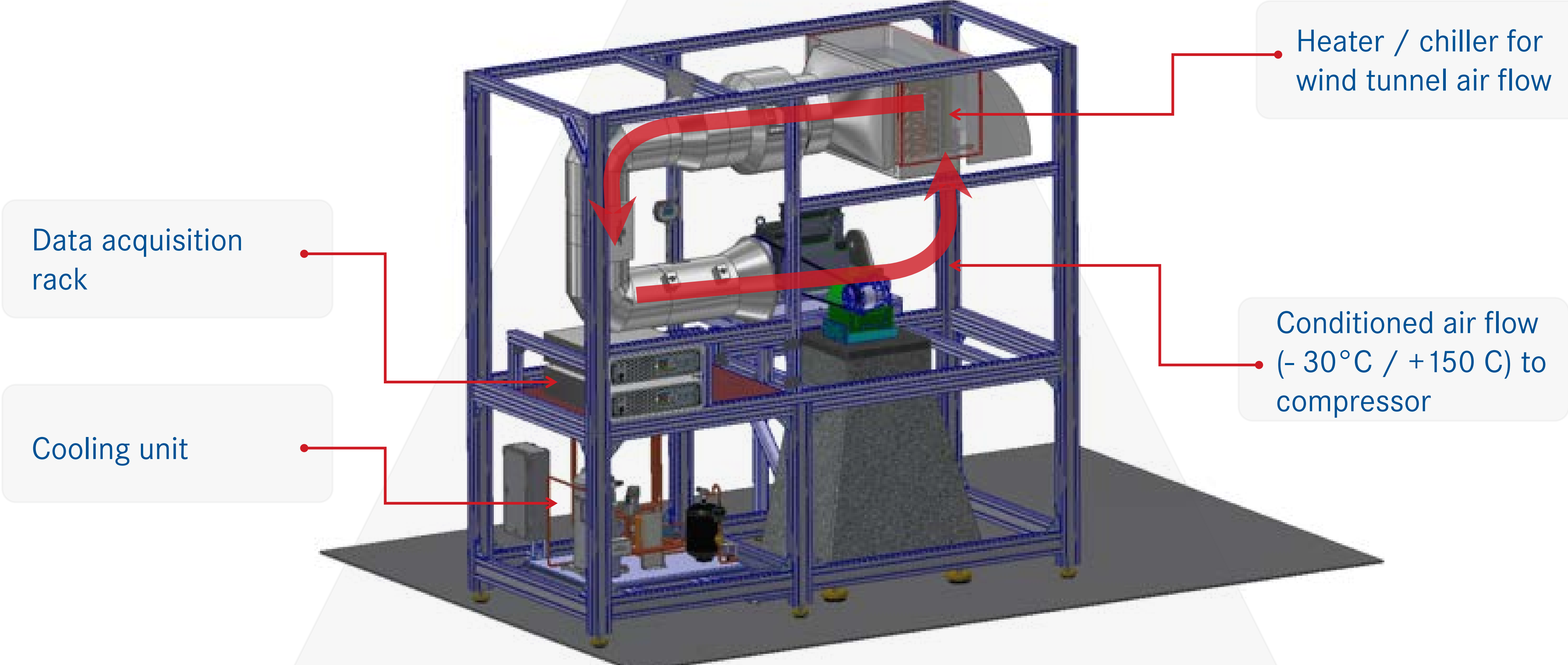
E-motor for pulley driven compressors

Compressor with VDA mounting

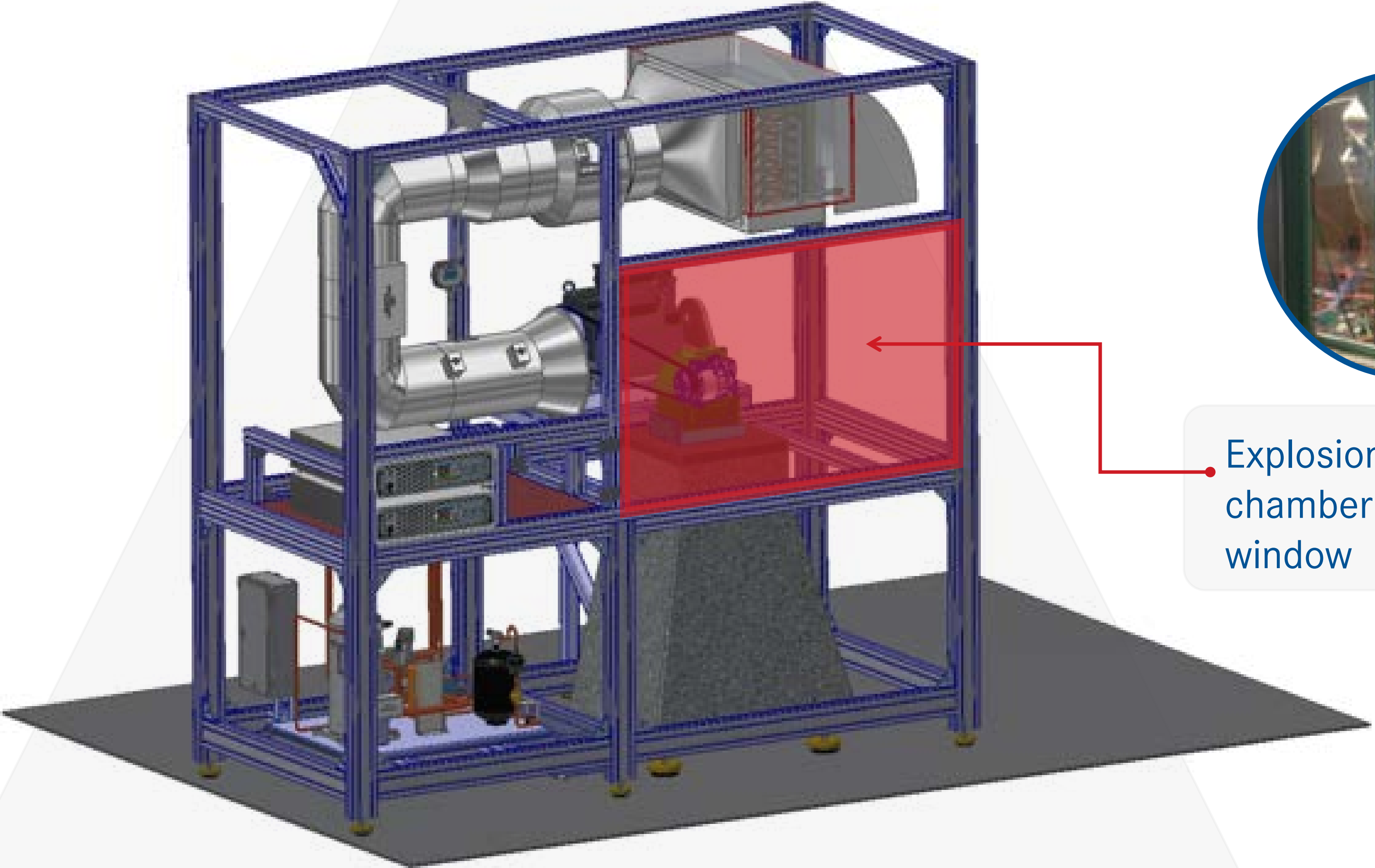
Seismic mass



# COMPRESSOR TEST BENCH OVERVIEW



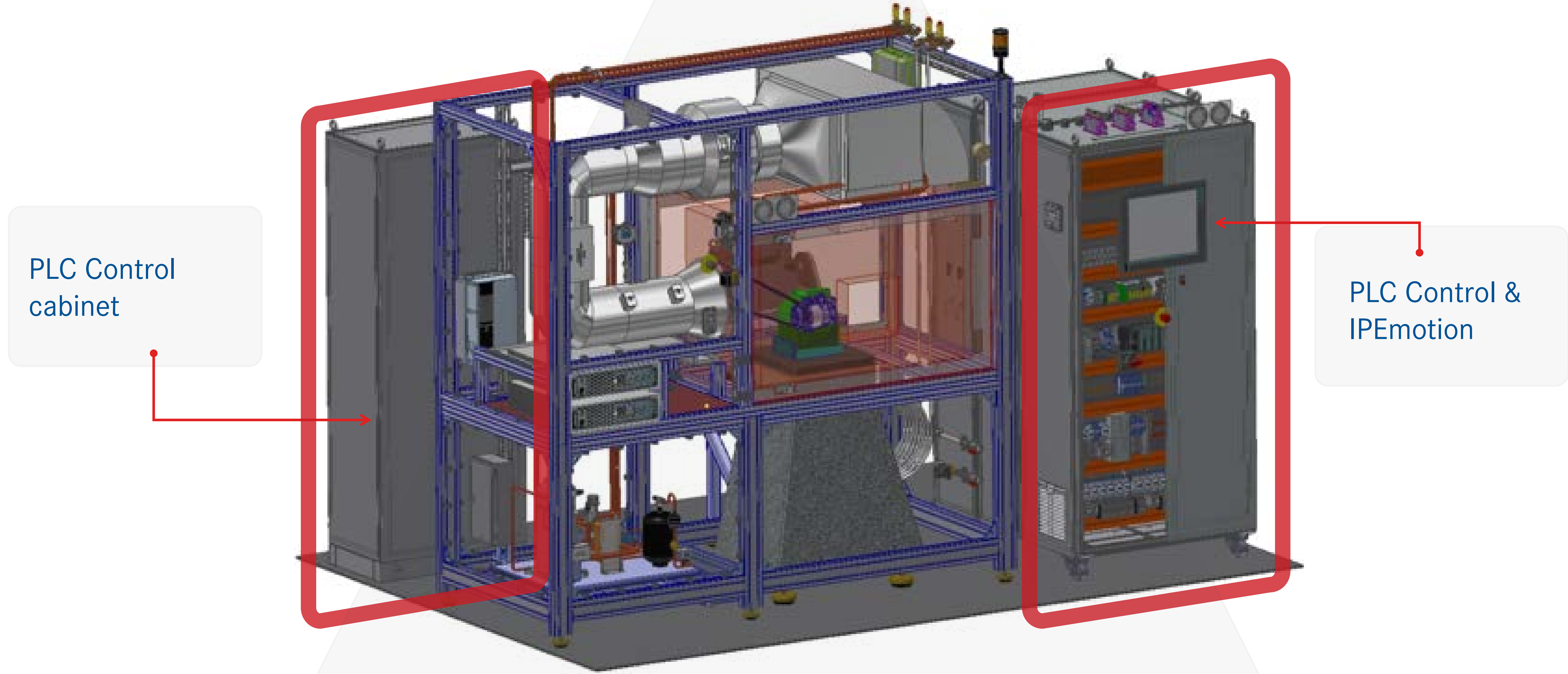
# COMPRESSOR TEST BENCH OVERVIEW



Explosion-proof test chamber with sight window



# COMPRESSOR TEST BENCH OVERVIEW



# CONCLUSION

▶  
IPEcompressor bench is a very sophisticated test system

▶  
A large range of VDA test standards are supported

▶  
Test program development by user-friendly IPEmotion software

▶  
High test repeatability & reliability



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