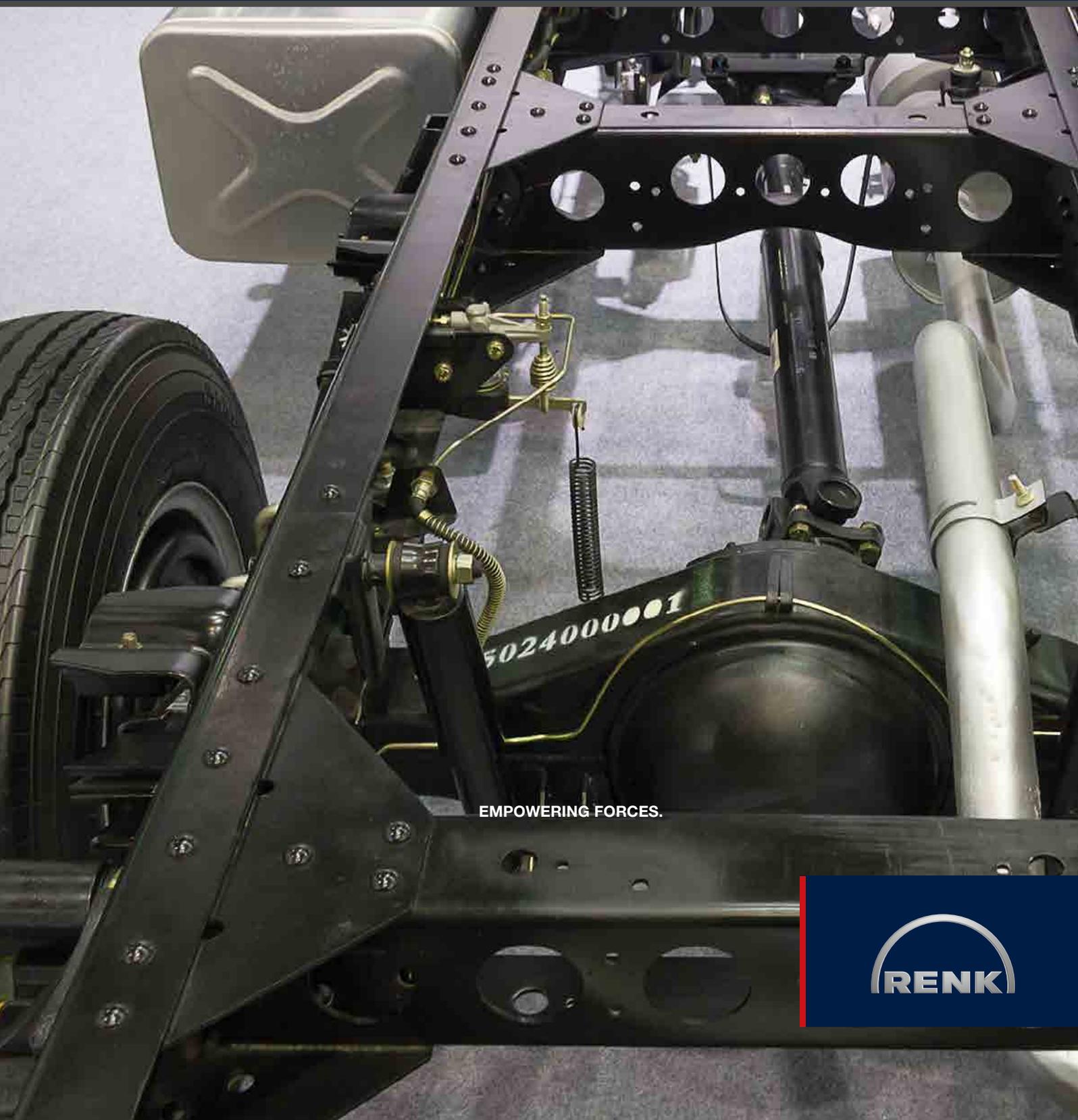


Heavy Duty Axle Testing – HEAT. Modular system for drivetrain testing.

Test systems for drivetrains in heavy-duty applications



EMPOWERING FORCES.



RENK TEST SYSTEM. **Your reliable partner for test rig solutions.**

RENK Test System GmbH (RTS) is one of the world's leading providers of customized test systems used in development, production, and quality assurance. Based on its many years of experience, RTS develops innovative and turnkey test rigs for every area of application in drive technology.

Efficient test sequences and evaluations, networking of test results with the tool chain in the vehicle development process (simulation, xIL) – and high flexibility in terms of different drive concepts with the associated media supply.

The HEAT product family from RENK provides a range of drive systems that allow a vast range of test rig configurations to be implemented quickly and cost-effectively.

Our expertise extends from targeted consultation, concept creation and validation, development, and production up to the commissioning of the systems at the customer's location, with subsequent training of the operating personnel. The entire product range is completed by needs-oriented service, application support and regular maintenance.

Safe

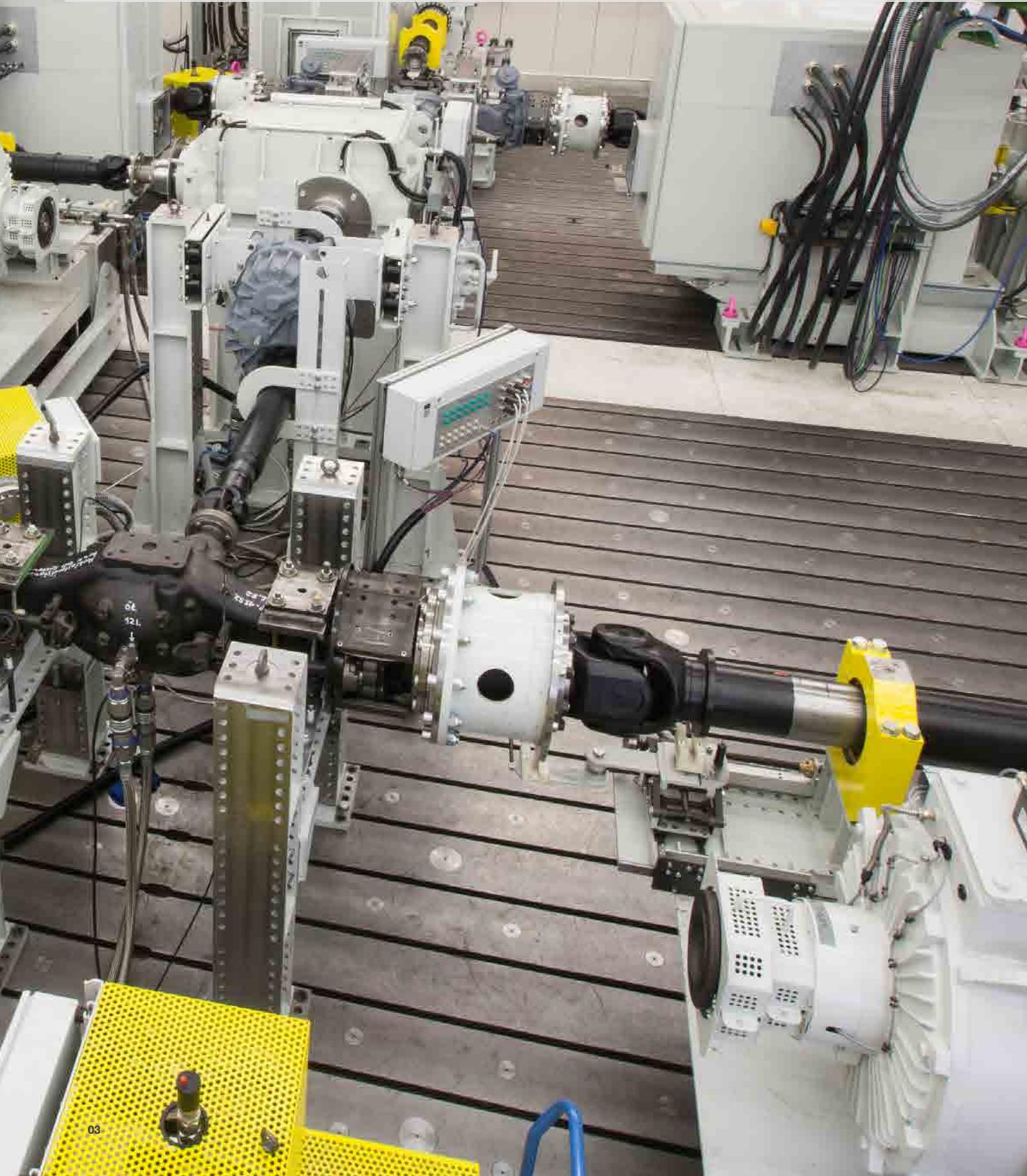
RENK safety concept – more than just CE conformity

Reliable

RENK RDDS – flexible and user-friendly test field automation

Cooperative

RENK Support - from maintenance to application



Heavy Duty Axle Testing – HEAT. Flexibility with standard modules.

In drivetrain development, the testing technology requires regular adaptation.

HEAT product family. Possible test-system components.

The power units in the HEAT product family can be combined in any number of ways to suit the respective testing tasks. To extend the testing possibilities, an existing test system can also be expanded at a later date by adding additional power units.

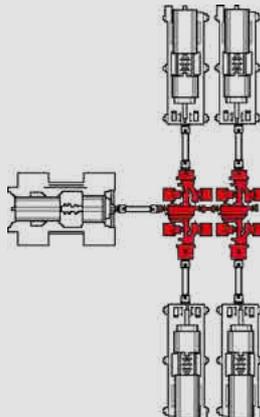
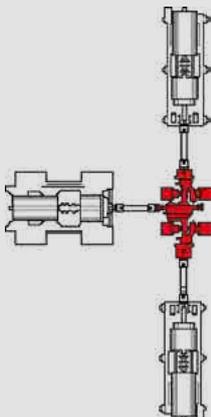
After installation of the required test setup, the components are interconnected via the RDDS automation system to form a complete test system with unified control technology.

Basic system:

- RDDS automation system
- Different power units as per customer requirements, consisting of the AC motor, matching gearbox, speed/torque measurement and mounting frame (motor/generator)
- Control cabinet
- Power and signal cabling

Optional:

- Lift and swivel mounting frame for power units
- Mounting frame for test pieces
- Couplings, adapters
- Test-piece conditioning
- Special measurement technology
- Test-piece measuring box
- Feed and regenerative transformer
- Sound insulation (power units/overall system)
- Floor plate, vibration-isolated foundation
- Parallel test operation of two test setups
- Integration of MATLAB/Simulink-models



Basic structural variants (examples)

Modular

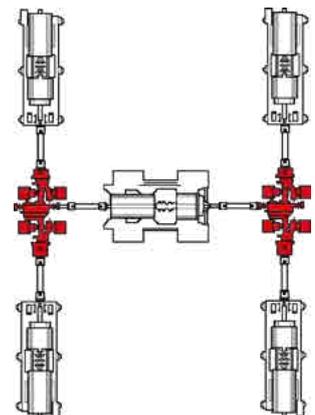
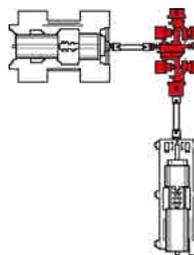
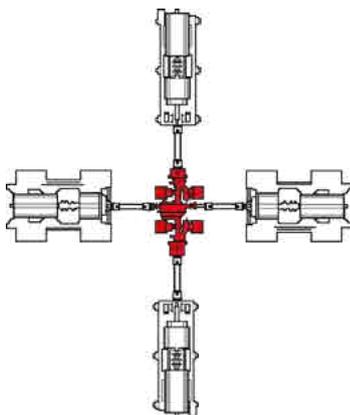
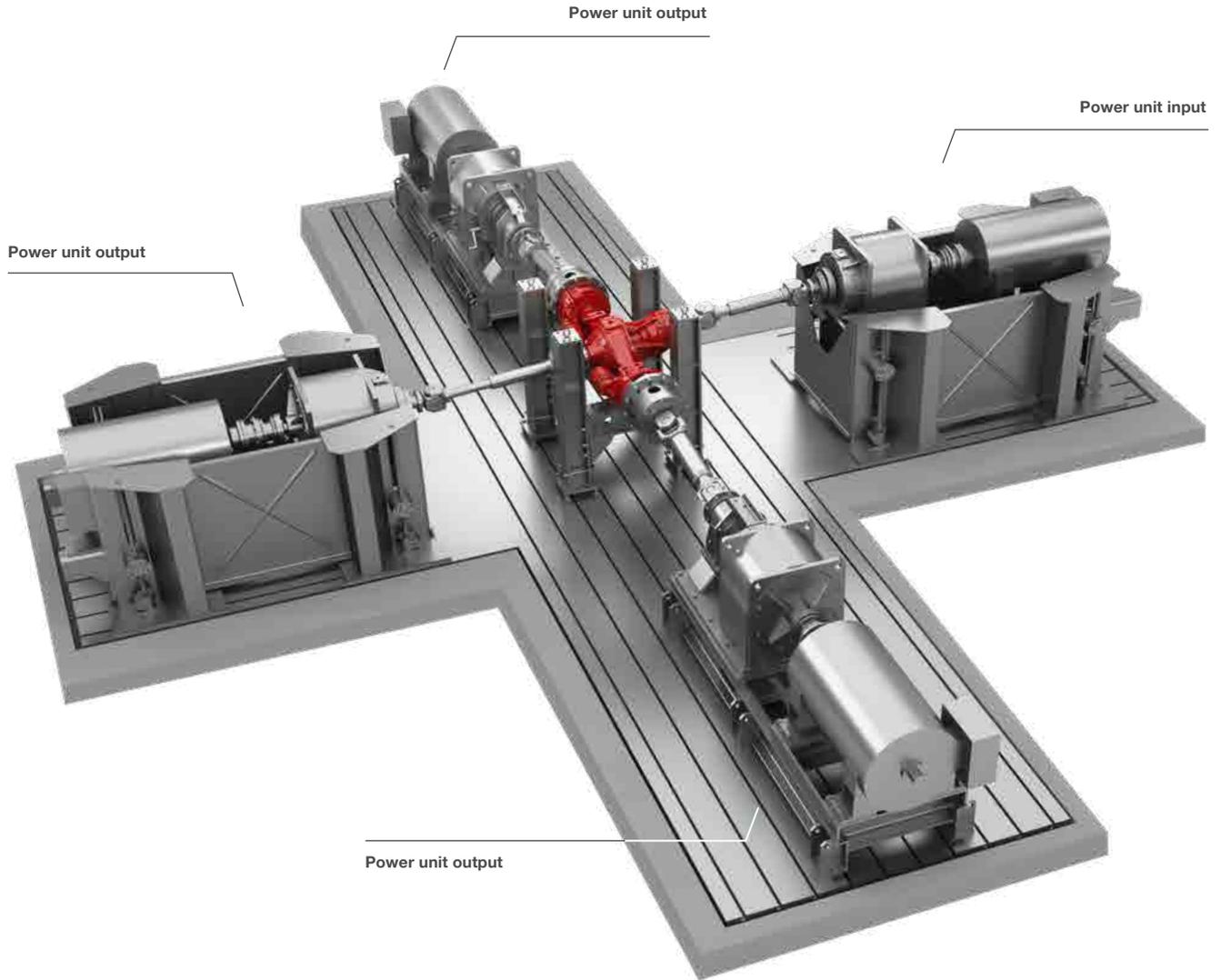
Availability of standardized power units

Flexible

Configure a wide range of test setups

Expandable

Integrate additional test rig components



HEAT product family.

Standard sizes for test rig drives.

Standardized power units. Mobile drives for any layout.

The power units of the HEAT product family cover the entire power range required for drivetrain testing in heavy-duty applications.

A power unit typically consists of a motor with speed sensing and a matching gear with torque measuring flange, which is fixed to a single mounting frame.

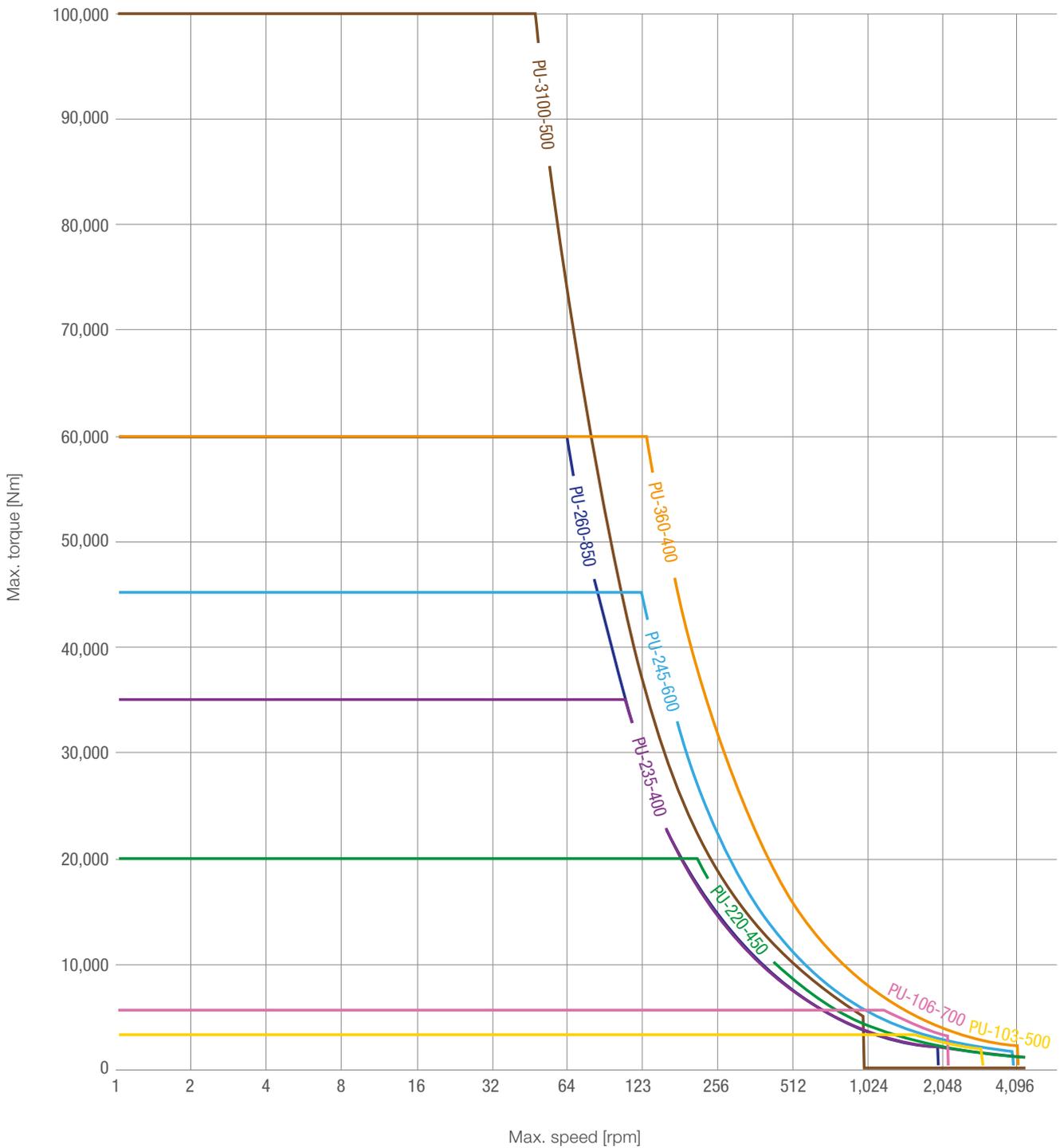
This unit can be positioned anywhere on the test bed using standard lifting devices such as an indoor crane.

The motors are AC machines in 4-quadrant operation, which can be used as motorized drive or regenerative load elements with optimized noise levels. The required test-piece speeds are achieved by means of special, low-maintenance test rig gear-boxes.

Performance

| Designation | | PU-103-500 | PU-106-700 | PU-220-450 | PU-235-400 | PU-245-600 | PU-260-850 | PU-360-400 | PU-3100-500 |
|----------------------------------|-------|-----------------------|-----------------------|-------------------------|-------------------------|----------------------------|-------------------------|-----------------------|-----------------------|
| Power | [kW] | 500 | 700 | 450 | 400 | 600 | 850 | 400 | 500 |
| Max. torque | [Nm] | 3,000 | 5,500 | 20,000 | 35,000 | 45,000 | 60,000 | 60,000 | 100,000 |
| Max. speed | [rpm] | 3,000 | 2,200 | 4,500 | 4,500 | 4,000 | 4,200 | 2,000 | 1,000 |
| Max. swivel angle | [°] | +/- 10 optional | +/- 10 optional | +/- 10 optional | +/- 10 optional | +/- 10 optional | +/- 10 optional | - | - |
| Dimensions (L x W x H) | [mm] | 1,600 x 1,200 x 1,700 | 1,600 x 1,200 x 2,500 | 2,000 x 1,500 x 1,600 | 2,000 x 1,500 x 1,600 | 2,200 x 1,500 x 2,500 | 2,200 x 1,500 x 2,500 | 2,800 x 1,500 x 1,600 | 3,500 x 1,500 x 1,800 |
| Weight | [kg] | 6,000 | 10,000 | 10,000 | 10,000 | 12,000 | 13,500 | 12,500 | 14,000 |
| Gear ratio | [-] | | | 9.25 4 2.1 0.9 | 13.6 4.4 3.1 1 | 9.25 3.3 2.1 0.75 | 9.25 4 2.1 0.9 | | 10.5 2.1 |
| Number of gear steps | [-] | 1 | 1 | 4 | 4 | 4 | 4 | 2 | 2 |
| Adjustment range for axle height | [mm] | 750-1,250 | 800-1,200 | 800 - 1,200 | 800 - 1,200 | 800 - 1,200 | 800 - 1,200 | 1,000 | 1,000 |

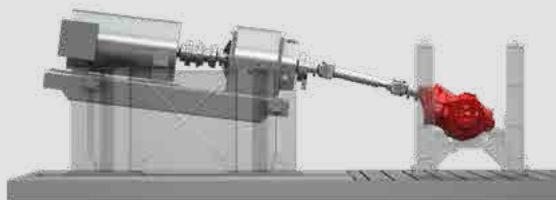
Power unit performance graphs.



Real load conditions. The drive units can be swiveled.

Meaningful testing means mapping the actual installation position.

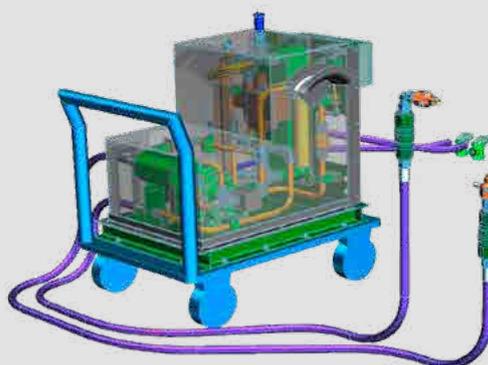
As standard, torque and speed are applied when testing the performance of a drivetrain. In addition, the rear axle can also be mounted in a way that replicates its real-world installation angle in the commercial vehicle. The drive units can also be swiveled for these setups to ensure that the quality of the applied torque is consistent.



Max. swivel positions of the drive units

Conditioning systems. Temperature conditioning of the rear axle.

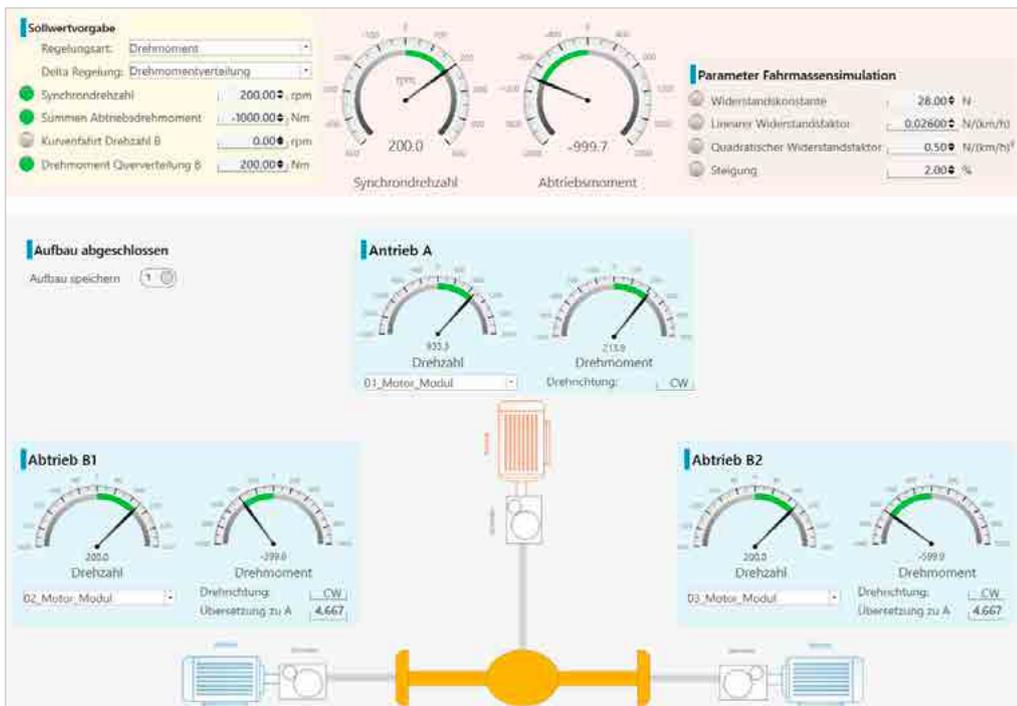
Conditioning of the test-piece oil is carried out using a separate oil supply unit in a closed circuit. All components are mounted on a common frame in a compact arrangement and can be freely positioned within the test setup. In addition to the elimination of power dissipation, the system can also be extended to include active heating and the generation of cold-start conditions.



Test-piece conditioning

RENK | RDDS.

All test setups are automated.



RDDS main display for HEAT with selected test setup and load displays (example)

Limitless variations. Maximum safety.

The full flexibility of the RDDS automation system becomes apparent with HEAT. All rear axles that are eligible for testing can be stored in the internal database, including the required test setups and test runs. Once the mechanical assembly for the test layout has been established, it is simply a case of selecting the current configuration at the operator station.

Once the desired test configuration has been selected, the automation system carries out an installation check independently. The selected test rig components and their respective assignments are checked and verified against the chosen automatic program.

RDDS carries out ongoing status monitoring during the test run. Based on the stored threshold values for the test system and test piece, the automation system ensures that the test program is suspended in the event of a fault and that the system is brought to a safe state. Thanks to this approach, HEAT ensures maximum safety for personnel, test pieces and machines – along with ultimate flexibility.

Service at RENK Test System GmbH. Your partner for custom service concepts.



RENK | Service

- Comprehensive
- Lifelong

Extend the lifetime of your systems with tailored service solutions.

RENK Test System GmbH offers a wide range of specific services, tailored to the respective system.

Benefit from over 60 years of experience in test rig engineering.

Use our customized offer, based on our SSC service support contract (technical support, inspection, and maintenance).

Service Support Contract

Inspection

- Regular inspections
- Determines condition of the system
- Specifies scope of maintenance

Technical support / Application support

- By phone
- In person
- Remote maintenance

Maintenance

- Regular calibration
- Condition-based maintenance/overhaul

RDDS (RENK Dynamic Data System). Automation system for test rigs.



RENK | RDDS

- Flexible configuration
- Easy to use

Sophisticated test systems call for flexible automation. One system for control, monitoring, storage, and visualization of your test procedure.

The benefits of RDDS come into play with highly complex development test stands in particular.

Graphics editors for the control technology, and sequence managing are ideal for implementing all requirements in a flexible, customized way. This is also supported by the database-oriented organization of the test rig, and test process configuration, the flexible system structure via the client/server architecture, and the user-defined displays for visualizing and operation.

- Extensive options for adapting the test procedure via open system architecture
- System structure based on industry platform TwinCAT, and standard industry hardware
- Graphics editor for easy configuration of the test run with extensive library elements
- Test run management for subsequent reuse or modification
- Modifiable displays for visualizing measuring data as defined by user
- Raw data stored centrally for analysis, and individual assessments
- Automatic reporting for standard test programs
- Option to link to numerous standard software packages (e.g., for simulation and analysis)

Follow the QR code and learn more about test system solutions from RENK.



www.renk-group.com/en/home

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