



# ***Test and Measuring***

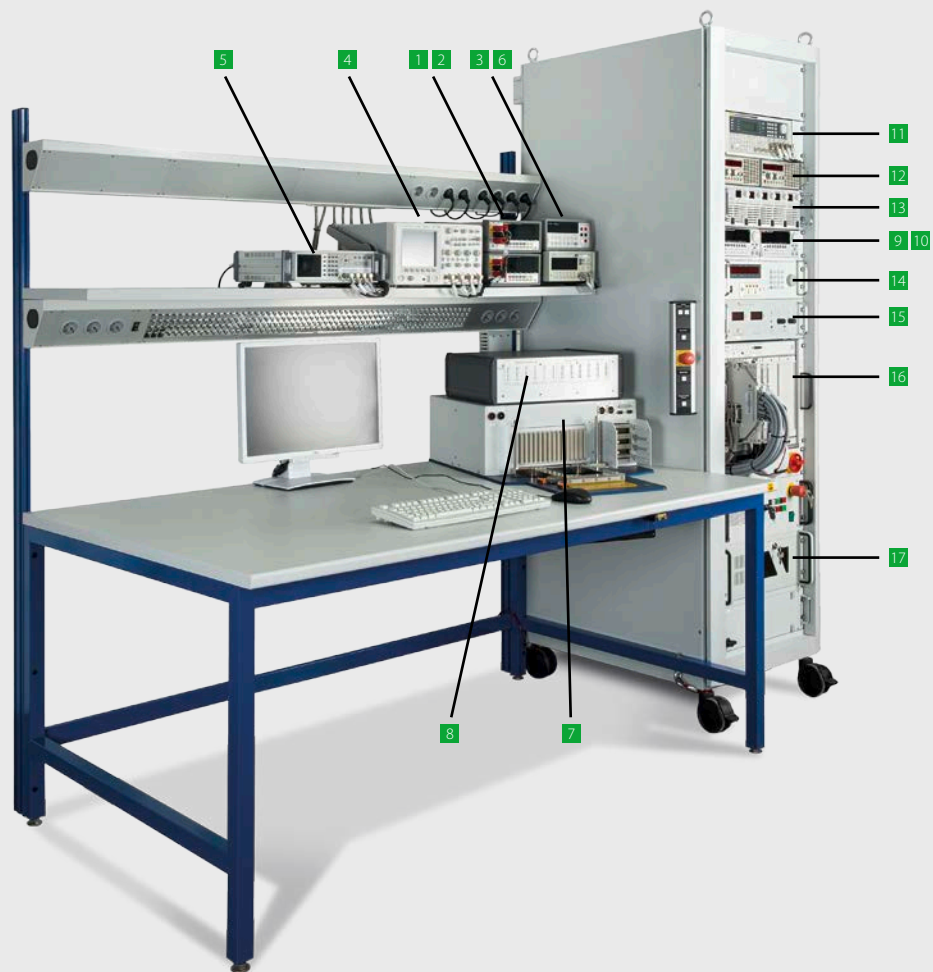
**KIEPE**ELECTRIC



# THE AUTOMATIC TEST SYSTEM KIEPE ATS

The Automatic Test System Kiepe ATS is a function tester for electronic modules and control devices. The Kiepe ATS can be used to test all kinds of modules and control devices, e.g. the simple analog/digital circuit, the function of power supply units and the function of controller modules via RS232 or a CAN bus. As the Kiepe ATS is remarkably easy to operate due to its clever menu navigation, function tests of complicated modules and control devices can be carried out within a very short time. Moreover, the system comprises sophisticated software tools, which support the experts by their repair of electronic circuits.

- 1 Multimeter (Fluke)
- 2 Multimeter (Fluke)
- 3 Multimeter (Agilent)
- 4 Oscilloscope (Agilent)
- 5 RCL meter (Wayne Kerr)
- 6 Timer/counter (Tektronix)
- 7 Terminal board
- 8 Digital I/O (VKD)
- 9 High-precision current source (Keithly)
- 10 High-precision voltage source (Keithly)
- 11 Function generator (Tektronix)
- 12 Electronic loads (H&H)
- 13 DC stabiliser module (Lambda)
- 14 AC source (Chroma)
- 15 Power DC stabiliser (Delta)
- 16 VXI multiplexer/relay unit (Agilent)
- 17 PC



## TEST BOX

The test box is a customized application for fast diagnosis of the on-board power supply system in the vehicle. It has a robust design and illuminated displays and is easy to operate. It is optimal for fast diagnosis of the on-board power supply system in the vehicle.



## THE DIGITAL I/O UNIT HAS 96 DIGITAL I/O CHANNELS.

The digital trigger signals are suited for a voltage range from TTL (5V) to 150V DC. Each trigger signal is freely programmable via the ATS system as active high or as



active low. The driver stages are rated for a continuous current of approx. 1 A and protected against overload by way of a fuse. The digital responses process levels between TTL (5V) and 150V DC and are also freely programmable via the ATS system with pull up and pull down resistors of 10K and 47 K, respectively. Moreover, the unit has a level monitor. This signal is detected and evaluated automatically by the ATS software during each digital I/O test.

In case of overload all channels are protected via a fuse and the unit indicates to the ATS system which fuse is defect.

## KIEPE ATS 5XX PERFORMANCE TEST BENCH FOR TRACTION INVERTERS

The DPU performance test bench is intended for testing the performance of Kiepe traction inverters (DPU) as a stand-alone device or fitted in a complete traction equipment set (optionally devices from other manufacturers). The traction equipment sets can be tested with and without their own traction control modules (ASM). In addition to the DPU peripherals like digital inputs and outputs or rpm channels are tested.

The load unit consists a three-phase, star-connected, ohmic-inductive load. The braking chopper is connected with a purely ohmic load. Moreover, the test bench has got small ohmic loads for optional on-board converters (BNU) and air conditioner converters (KGU).

Basic data of the Kiepe ATS 5xx test bench:

- Output: DC 0-1000V (opt. up to 2000V)
- Load: ohmic-inductive, I<sub>out</sub> up to 300 A
- Function and performance test
- Test of converters, inverters and braking choppers
- Test of digital inputs/outputs
- Test of speed inputs
- Software for automatic simulation of appropriate driving and braking cycles



## KIEPE ATS 3XX PERFORMANCE TEST BENCH FOR THE ON-BOARD POWER SUPPLY SYSTEM

The performance test bench for the on-board power supply system (ATS 3xx) is an automated test bench for the test and repair of on-board power supply systems. The ATS 3xx has been developed for testing the on-board power supply systems on vehicles of the Berliner Verkehrsbetriebe (BVG) (GSU4 AEG/Siemens) as well as on-board power supply systems of APS electronic, Switzerland (GWL-B 750) and of Kiepe Electric (BNU/KGU).

The automated performance test bench for the on-board power supply system (ATS 3xx) combines two important steps for the testing of power components:

- Preliminary test at reduced voltage / power
- Performance test at nominal voltage and nominal power

### For this purpose the ATS 3xx has got two separate measuring systems.

The ATS 3xx provides the following hardware for the **preliminary test**:

- 3 voltage stabilisers 0-150V DC; 10 A
- 2x 16 measuring channels 0-150V; 0-30 kHz; AC/DC selectable

- 3 floating changeover contacts
- 4 floating make contacts
- 8 channel digital input TTL - 150V DC level incl. high/low monitoring
- 2 RS232 interfaces
- 1 CAN bus interface

The ATS 3xx provides the following hardware for the **performance test**:

- 1 DC source 0-1500V DC; approx. 50 kW to 100 kW: (higher performance on request)
- 6 measuring channels 0 - 1500V DC
- Three-phase load with energy recuperation of 32 kW (optional 64-96 kW) incl. measurement equipment
- DC load
  - implying energy recuperation from 80V DC to 600V DC; 32 kW incl. measurement equipment
  - implying electronic load from 24V DC to 80V DC; 0 - 1050 A incl. measurement equipment
- 2x RS232 interfaces
- 1x CAN bus interface



## KLP

All functions of Kiepe's traction inverter DPU can be tested with Kiepe's low-power test facility KLP 200. The test is made at the nominal voltage and with reduced power on the load side. The DPU is connected with the KLP 200 via an adapter cable. The KLP 200 includes a mainframe for the optimal and user-friendly visualisation of the test process, for simple operation and for repair. It is a stand-alone test facility and is intended for the customer's main workshop. The test is fully computerized and very efficient in the workshop due to its optimal human-machine interface (HMI).

Technical data of the KLP 200:

- DC supply for the DPU between 0 - 1 000 V DC / 32 kW
- AC load for the DPU with a maximum motor current of 100 Aeff
- 20 A DC brake load for the DPU
- 9 measuring channels for the detection of motor currents, brake current etc.

## SERVICES

Problem-oriented analysis of the state of the CAN vehicle bus in vehicles from Kiepe Electric by means of a CAN logger.

If there is a problem with a vehicle that might involve the CAN vehicle bus, the customer can ask us to perform troubleshooting.



- Automatic test sequence of the DPU
- Diagnostic software for the support of repair actions

Scope of supply:

- Complete low-power test facility with DC supply, AC/DC load unit and monitor



Kiepe Electric employs system engineers and vehicle bus specialists, who work closely together with the customer to develop a trigger condition for the CAN logger, i.e. to achieve that the problem is considered by the configuration of the CAN logger.

The customer receives this CAN logger, inclusive installation instructions and connecting cables, as a loan so that he can connect it himself in the vehicle. The data are recorded, saved on a memory card and have to be sent to Kiepe Electric for evaluation. After the evaluation the customer receives a detailed report in written form.

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