



**AUTOTESTGERÄTE LEITENBERGER GMBH**



Product catalogue  
english





## SCHWABEN<sup>(SWABIAN)</sup> POWER SINCE 1969

### **Schwaben (swabian) power since 1969**

From the outset, our employees' development capabilities and innovative ideas, characteristic qualities of the people of the area, rapidly led to an extensive range of measuring, testing and recording instruments, designed to record physical variables.

In addition, the range now includes mechanical, electronic and optical testers.

Of medium size, the Company has undergone considerable expansion as a result of further developments in every product group.

In turn, we have been able to optimise our services and to introduce the latest technologies jointly with our customers and, in this way, to establish long-term business relationships.

Thanks to our uncomplicated, direct contact with the customer, we are able to satisfy the most wide ranging of functional and other requirements in the minimum of time, with reliable, thorough solutions.

To this end, we also collaborate with efficient associates worldwide, guaranteeing exceptional value for money and high standards of quality. Customer satisfaction throughout the world confirms our success on a global scale.

Thanks to user satisfaction and a loyal customer base, Autotestgeräte Leitenberger GmbH

can look forward to a successful, innovative future.

The LEITENBERGER Company was founded in 1969 in Reutlingen, an industrial town south of Stuttgart in the Federal German State of Baden-Württemberg.

Since then the company logo is unchanged:

## **Leitenberger Reutlingen**

Today, the current headquarters of the LEITENBERGER Group are located in the municipality Kirchentellinsfurt in the district of Tübingen.

The municipality with a population of around 5500 is located in the river Neckar valley, approximately 30 km south of Stuttgart.

**QUALITY**



**MADE IN GERMANY**



## ENGINEERED AND MADE IN GERMANY



### Headquarter: Bahnhofstraße 33

- Offices, administration, purchasing,
- sales, QA, exhibition room, training room
- Lab for development electronics/ software, Development, Mechanics
- Production parts, Shipping

### Factory IV: Wannweiler Straße 3

- CNC foam rotary cutter
- Case production, empty case and foam material blank warehouse
- Lab for sensory devices (software/ hardware) software development



### Factory I: Bahnhofstraße 32

- Quality check
- Production, installation
- Lab / Development
- CAD office, 3D printer
- Electronics system
- Circuit board configuration
- Repair shop

Our company is part of the **LEITENBERGER-group** with plants in Germany and Greece.

Following companies also belong to the group:



**LEITENBERGER**  
Mess- und Regeltechnik GmbH

- Thermometers
- Combistats
- Digital thermometers
- Pressure gauges for refrigerants



### Factory II: Alexandroupolis, Greece

- Pre-installation
- Partial installation
- Warehouse

Autotestgeräte  
**LEITENBERGER GmbH**

- Development
- Production
- Prototyping
- Solutions



Druck & Temperatur  
**LEITENBERGER GmbH**

- Pressure Gauges
- Pressure Calibration
- Thermometer
- Temperature Calibration
- Data Logging and Recorders



### Factory III: Commercial park

- Cardboard warehouse
- Packaging material warehouse
- Depot
- Employee parking spaces
- Visitor parking spaces

## CONTENT

### COOLING SYSTEM



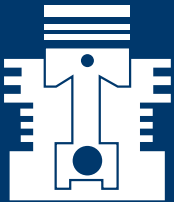
#### COOLING SYSTEM

8 - 21

Cooling system testing equipment, cooling system tester case custom made, diagnostic, vacuum cooling system filler, accessory for vacuum cooling system fillers, adapters for testing cooling systems, CO<sub>2</sub>-leak detector, refractometer for different liquids, flushing device for cooling system



### ENGINE



#### ENGINES

22 - 35

Cylinder leakage testers for petrol and Diesel engines, dead point gauge (TDC), compression testers, intake system cleaner, oil pressure testing equipment, topping up engine oil, digital thermometer, belt tension gauges, carburetor tester, revolution counter



### PUMPS

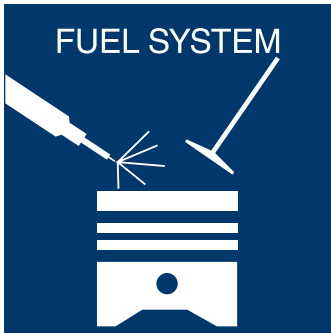


#### PUMPS

36 - 45

Vacuum and pressure pumps, hand operated transfer pumps, hand metering pumps, hand suction pumps, accessories for manual vacuum extraction and metering pumps, barrel suction pumps, oil suction program

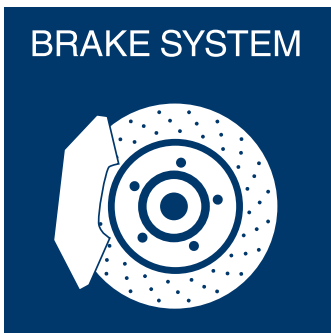




**FUEL INJECTION SYSTEM**

**46 - 69**

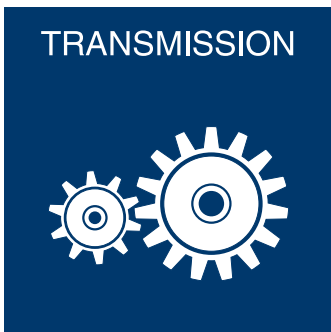
Common Rail high pressure tester, static and dynamic high pressure pump test, injector function test, return flow volume measurement, fuel identification, injection tester, Diesel bleeding, fuel suction device, fuel consumption meter, accessory for Diesel injection control units, fuel pressure and leakage tester, system pressure test on low pressure side, fuel supply pump tester, test benches for automatic injector testing, mini test bench, injector cleaning, fuel consumption meter



**BRAKE SYSTEM**

**70 - 79**

Brake fluid tester, refractometer, brake pressure testers for transport vehicles, brake pressure testers, digital brake pressure testers, vacuum brake bleeders, accessory vacuum brake bleeder, brake bleeder service unit, brake bleeder adapter kits, brake line bending tool



**TRANSMISSION**

**80 - 85**

Service station for automatic transmission oil, pressure and vacuum pump for the suction, the refilling and the scavange of gearbox-oil, gear oil filling pump, diagnostic, oil pressure tester



## HYDRAULIC



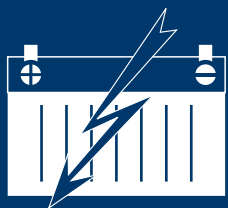
### HYDRAULIC

86 - 93

Testing and diagnosing hydraulic systems of passenger cars, trucks, utility vehicles and other vehicles, hydraulic testing devices, hydraulic system tester, digital hydraulic test device, universal digital pressure measurement with differential pressure indication, universal digital pressure measurement with USB-interface, digital pressure gauge



## ELECTRIC & CHARGING SYSTEM



### ELECTRICAL/ CHARGING SYSTEM

94 - 107

Electric multifunction circuit testers, tester for battery and charging system, electronic protection, short circuit detector, code maintainer, multimeter, glow plug testers, trailer lighting tester, illumination testers - tractor testers, accessory for illumination testers



## SAFETY



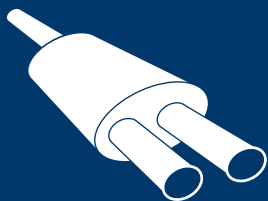
### SAFETY

108 - 115

Aero wipers testing and adjusting tools, electronic force measurement, tire pressure - checking and filling



## EXHAUST SYSTEM



### EXHAUST SYSTEM

116 - 123

Service equipment for SCR systems, test tools for charge air systems, filler units, suction pumps, pressure and tightness tester, leakage tester, test devices for exhaust systems, leakage test fresh air intake



## COLD AIR INTAKE SYSTEM



### COLD AIR INTAKE SYSTEM

**124 - 127**

Leakage test fresh air intake, Leak testing of charge air systems, cleaning tool exhaust gas counter-pressure sensor, blow-by-gases measurement device, Intake System Cleaner



## AIR CONDITIONING



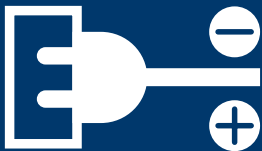
### AIR CONDITIONING

**138 - 131**

Tightness test system for air conditioning systems, electronic leak detector, 2 way manifold test kit, barrel suction pump, filling hoses set, quick couplings



## ALTERNATIVE PROPULSION SYSTEMS



### ALTERNATIVE PROPULSION SYSTEM

**132 - 139**

Leakage tester for battery housings, pressure measurement, measuring leakage rates, tightness tests, cooling system filler, automatic evacuation, filling and testing, refractometer, adapter, automatic device for filling and testing, coolant diagnosis, insulation resistance tester



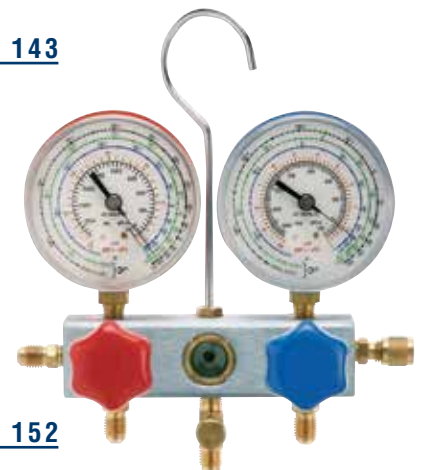
## MISCELLANEOUS



### MISCELLANEOUS

**140 - 143**

Tool Set for park distance control, pressure plate set, flowmeter for air, mudguard protection, steering wheel protection, seat cover



### INDEX

**144 - 152**



Vacuum cooling system filler - KVB 01



Cooling system tester - TVU 138

## For fast and safe maintenance

- safe and fast pressure test
- fast filling
- free of air pockets
- no need for subsequent bleeding
- wide range of adapters



Suitable adapters



## Cooling system testing equipment

A leaking cooling system is identified by a loss of pressure. All cooling system testers with quick-release couplings are capable of performing a self test (for leaks) WITHOUT the use of any auxiliary equipment.

Testing equipment for the leak testing of cooling systems and adapters for cars, transport vehicles, motor cycles, agricultural and construction machines. Also suitable for cooling systems in hybrid, EV and fuel cell vehicles.

A case containing cooling system test instruments can be fitted out in accordance with your personal requirements. For the specifications of standard test instrument cases, see the examples at the next pages.

- Cooling system tester
- Cooling system Diagnostic
- Vacuum cooling system filler
- Adapters for testing cooling systems
- CO<sub>2</sub> Leak Detector
- Refractometer
- Coolant diagnosis
- Flushing device for cooling system and heat exchanger
- Thermometer for cooling water

### COOLING SYSTEM



You can find the suitable test adapters in the „Adapter list for cooling system testers“ on the Internet at: <http://www.autotestgeraete.de/en/service/downloads.html>

QR-code to  
the adapter lists



Cooling system tester - TVU 139/1



## Cooling system tester

### Individual cooling system test kit



Case

Cooling system tester

K-adapter with bajonet connection

K-adapter with thread connection

### Example of a complete cooling system test kit

A case containing cooling system test instruments can be fitted out in accordance with your personal requirements. For the specifications of standard test instrument cases, see next pages.

KDV 01

060109



### Combination pump for pressure and vacuum with change-over ring

#### 2 functions - 1 pump

- compound gauge DS 63 mm (2 1/2") with robust protective rubber cap
- with dual fine scale
- vacuum range -1...0 bar / 760 mmHg
- pressure range 0...3 bar / 42 psi, fine graduation 0.05 bar

#### 2 operational alternatives

- as pressure pump for cooling system
- as vacuum pump for checking vacuum functions in the vehicle

1 hand pump KDV 01 reversible, with quick coupling

1 flexible hose FZ 100K, connectable

1 conical plug-in adapter made of brass (vacuum range)

1 PVC hose 0.50 m (20 in.) long, hitchable (vacuum range)

4 plastic adapters

Delivery in paper box

For adapter list, see QR-code at page 9.

TVU 100/2

010109



### Commercial cooling system tester for the connection to compressed air

by means of a tire inflating valve. Includes quick coupling, high quality gauge 52 mm (2"), double scale 0...2.5 bar / 0...36 psi, overpressure valve adjusted to 1.2 bar. Suitable for trucks and agriculture vehicles with large volume cooling systems in order to avoid prolonged pumping.

Delivery in paper box

TVU 139/1

010130



### Cooling system tester with quick coupling and drain valve

in fibreglass reinforced ABS body. DS 52 mm (2") precision pressure gauge with robust protective rubber cap, double scale 0...2.5 bar / 0...36 psi. This tester is distinguished by the ergonomic design of the pump body.

**Note:** Further ranges on request.

Delivery in paper box

TVU 139/1S

010130\_4



### Cooling system tester

Cooling system tester with quick coupling. Same as TVU 139/1, but with fixed hose.

Delivery in paper box

TVUD 139/1

010136\_1



### Cooling system tester with digital pressure measurement and indication

suitable for pressure tightness tests, e.g. cooling system  
Application: If small leaks/ pressure loss has to be detected.

- Measurement range: 0...4 bar
- Accuracy: 1 % FS
- Resolution: 10 mbar (0.01 bar)

TVU 139/2

010131\_1



### Cooling system tester

Same as TVU 139/1, TVU 139/1, but with different gauge with larger pressure measurement range. Measurement range: 0...4 bar.

Delivery in paper box

TVU 138/7

010110\_2



### Cooling system tester with quick coupling and drain valve, aluminium body

Aluminum version with a cylindrical housing, precision pressure gauge, with rubber protective cap, double scale 0...2.5 bar / 0...36 psi.

**Note:** further measurement ranges or test equipment compliant design according to DIN standard. ISO 9000 ff on request.

Delivery in paper box

## Cooling system tester case custom made

The case can be fitted out in accordance with your personal requirements:  
**case + pump + adapter**

The assignment of the adapters designated K, KS and KW to the respective vehicle manufacturer is shown at our website at service, downloads: "Adapter list for cooling system testers".  
The following cases are based on popular request.

LR 150\_Motorrad

010727\_3



### Cooling system test kit for motorcycles

suitable for European and Asian makes. To permit working in confined spaces in particular, the kit includes an angled adapter with extension hose.

**1 cooling system tester TVU 138/5**

**1 angled adapter KW 90**

Delivery in solid plastic case

LR 150\_PORSCHE 2

010781\_1



### Cooling system test kit for Porsche models

Cooling system test kit with adaptations (K..) to the expansion tank, suitable for almost all Porsche models, incl. adaptations (DS..) for functional and tightness test of the cooling system cap.

Test adapters - types and applicable Porsche models:

KS 22, DS 22K - model 911, 996, Carrera GT, Cayman, Boxster

K 60, DS 60K - model 924, 928, 944, 968

KS 65, DS 65K - Cayenne from 2002 (year of mfr.)

**1 cooling system tester TVU 139/1**

**1 flexible connector FZ 100K**

**6 test adapters (K60, KS 22, 65, DS 60, 22, 65)**

Delivery in solid plastic case

# - 12 - Cooling System

LR 229

010922



## Master cooling adapter kit with 11 adapters

Master cooling adapter kit for a large variety of the latest European und Asian vehicles.

- 1 cooling system tester TVU 139/1**
- 1 flexible connector FZ 100K**
- 11 test adapters (K 60, KS 25, 22, 31, 32, 38, 62.1, 65, 77, 86, 90)**
- Delivery in solid plastic case**

LR 230

010923\_1



## Combination radiator tester

Combination radiator tester for new generations of vehicles from VW, Audi, Ford, Opel and far eastern manufacturers.

Due to space restrictions, the latest vehicles necessitate the use of angle adapters. As a result, the specification includes three adapters of that type (prefix KW ..).

- 1 cooling system tester TVU 139/1**
- 1 flexible connector FZ 100K**
- 6 test adapters (KW 77, 85, 90, KS 31, 38, 65)**
- Delivery in solid plastic case**

LR 250

010949\_1



## Cooling system tester, Master-kit 2, 7 Adapters

Cooling system master kit. With 7 adapters.

- 1 cooling system tester TVU 139/1**
- 1 flexible connector FZ 100K**
- 7 test adapters (KW 77, KW 85, KS 79, KS 82.2, KS 84, KS 86, KS 90)**
- Delivery in solid plastic case**

LR 310

011004



## Cooling system test kit with universal adapter UA 50

Cooling system test kit with universal adapter UA 50 (without individual adapter); application range radiator orifices diameter 20...41 mm (3/4...1 5/8").

- 1 cooling system tester TVU 139/1**
- 1 universal adapter with hand wheel UA 50**
- 1 flexible connector FZ 100K**
- Delivery in solid plastic case**

## Cooling system Diagnostic

The Diagnostic unit 2000 allows the testing of all functions of the cooling system on all vehicles, without any additional adapters.

Diagnostic unit in a metal housing for the testing of cooling systems for leaks through pressure loss. It operates on compressed air and uses an integral pressure regulator.

**Diagnose 2000**

**011501\_1**



### Diagnostic unit in a metal housing for the testing of cooling systems for leaks through pressure loss

The Diagnostic unit 2000 allows

- the testing of all functions of the cooling system
- on all vehicles
- without any additional adapters

It operates on compressed air and uses an integral pressure regulator. The pressure loss is indicated by an LCD display, either in % or bar, as required. The thermostat temperature can be monitored during the test by means of a temperature sensor (supplied). The instrument is connected to the return line of the supply tank by a number of brass hose connectors with hose clips. Power supply 12...24 VDC.

#### Testing facilities:

- cooling system pressure and leak test (0...3 bar / 0...43 psi)
- opening and closing pressures of the original cap
- cylinder head gasket
- engine block for cracks (locate)
- thermostat check (0...120 °C, 32...248 °F)

**1 diagnostic unit 2000**

**1 temperature sensor**

**3 hose connectors, made of brass**

**Delivery in solid plastic case**



## Vacuum cooling system filler

The vacuum cooling system filler ensures that the cooling system is rapidly filled with coolant, free of air pockets and without any need for subsequent bleeding.

It is used following repairs or for the first fill. The machine also carries out a **vacuum leak test**, preventing the filling of a leaking cooling system. A vacuum is generated in the cooling system by means of the workshop compressed air supply (6...10 bar) and a venturi nozzle. Provided the vacuum remains constant, the cooling system can be rapidly filled, devoid of any air pockets; the coolant is drawn in under vacuum.

- The filling method can be used on any type of vehicle
- the coolant is devoid of any air pockets
- security of the process
- easy to use
- the filling process and vacuum leak test are completed in about five minutes
- no maintenance required
- can be used to bleed stationary heating systems
- independent from the volume of cooling system

Also suitable for cooling systems in hybrid, EV and fuel cell vehicles.

**KVB 01**

**011401\_1**



### Vacuum cooling system filler with quick coupling

The unit can be used with any LEITENBERGER Radiator Adapter with a K., KS., KW. or UA. prefix (for customers who already have K., KS., KW. or UA Adapters).

**1 vacuum cooling System filler**

**1 venturi nozzle**

**2 suction/emptying tube PVC, each 1.50 m long**

**Delivery in solid plastic case**

# - 14 - Cooling System

KVB 01.1

011401\_2



## Vacuum cooling system filler with quick coupling and UA 50

The unit can be used with any LEITENBERGER radiator adapter with a K, KS, KW or UA prefix.

- 1 vacuum cooling system filler,**
- 1 venturi nozzle,**
- 2 suction/emptying tube PVC, each 1.50 m long**
- 1 additional UA 50 universal adapter**  
(20...41 mm diameter (0.7...1.6 in))
- Delivery in solid plastic case**

KVB 02

011402\_1



## Vacuum cooling system filler with rubber cone for connection to the cooling system filler neck

Vacuum cooling system filler with rubber cone for connection to the cooling system filler neck.

- universally applicable by conical rubber seal

- 1 vacuum cooling system filler KVB 02, 1 venturi nozzle**
- 2 suction/emptying tube PVC, each 1.50 m long**
- Delivery in solid plastic case**

KVB\_XL 01

011417\_1



## Coolant Filling Device for Trucks and Industrial Engines

KVB XL is designed to run out the filling process of cooling systems (after repair or even first filling). After the filling procedure there is no need of bleeding.

A special venturi assembly is generating vacuum by workshop pressure (6...10 bar).

During the vacuum generation a tightness-test is run out in order to avoid the filling of a leaky coolant system. After a positive tightness-test of the cooling system the filling process can be started.

- special version suitable for large cooling systems e.g. trucks/ industrial engines
- large hose diameters are suitable for a fast filling process
- very fast vacuum generation
- filling method is suitable for all cooling systems, large range of adaptors to the cooling systems expansion tank available (not included)
- easy handling
- no bleeding required after the filling process
- stable process
- maintenance-free device
- the complete process takes ca. 15 minutes
- independent from the volume of the cooling system

## Accessory for vacuum cooling system fillers

IN 06

100228\_1



## Venturi nozzle

Accessories for all KVB 01-devices.

Ultimate vacuum, 70 mbar (Pabs), -0,930 bar (Prel).

To generate a deeper vacuum in the cooling system to enlarge the degree of filling. Easy to connect to all KVB 01 devices, without any modifications.

## Vacuum generation

(on request)



### Electric vacuum pumps

For mobile use! Absolute vacuum up to 30 mbar (pabs). Modern thermomanagement systems (e.g. engine cooling system, air intake intercooler, battery cooling etc.) have to fulfill many purposes. These thermomanagement systems usually need to have a better filling grade compared to "traditional" engine cooling systems. With a better (deeper) final vacuum, better filling results can be obtained. Of course all components exposed to the vacuum level must be designed and manufactured to withstand these physical conditions.

- Operating Voltage: 230 VAC / 12 VDC / 24 VDC
- Final vacuum (pabs): up to 30 mbar (prel): ca. -970 mbar / ca. -0.97 bar
- Extraction hose with DN5 coupling for connection to all K-adapters

Electric vacuum pumps can be used with any of the Leitenberger Engine-Coolant-Filler KVB and they are delivered „ready to use“. In the delivery, adapters towards the expansion tank are not included.

- 1 electrical vacuum pump
- 1 Suction hose with DN5 coupling

## EV 30\_12VDC

011411\_1



### Mobile, electrical vacuum pump absolute vacuum 30 mbar (pabs)

For mobile use! Absolute vacuum ca. 30 mbar. A better (deeper) final vacuum, better filling results can be obtained. Of course all components exposed to the vacuum level must be designed and manufactured to withstand these physical conditions.

- Operating voltage: 12 VDC, suitable for mobile use
- Current consumption: approx. 3.5 A
- Final vacuum: (pabs): 30 mbar, (prel): ca. -970 mbar / ca. -0.97 bar
- Weight: 1.6 kg

EV 30\_12VDC can be used with any of the Leitenberger KVB and it is delivered "ready to use". In the delivery of EV 30\_12VDC no adapter towards the expansion tank is included.

## GKS 01

010411\_1



### Set of rubber cones with adapters

Set of rubber cones with adapter for connection to the quick-fit connector of the KVB 01 vacuum-type radiator filling unit.

#### Uses:

- rubber cone 1: 16...33 mm diameter
- rubber cone 2: 23...42 mm diameter
- rubber cone 3: 34...52 mm diameter

#### Delivery in solid plastic case

## KVBB



### Plastic container with contents scale for coolant

#### Versions:

Code	Capacity	Ref No.
KVBB 10	10 liters	011406_1
KVBB 20	20 liters	011405
KVBB 30	30 liters	011403_1
KVBB 01	30 liters, ball valve, wide neck opening	011400_1

#### Delivery in solid plastic case

## Adaptions for cooling system

The assignment of the adapter (K., KS.. and KW..) to the vehicle manufacturer, you can find on the Internet at: <http://www.autotestgeraete.de/en/service/downloads>, in the "Adapter list for cooling system testers", or you scan the QR-code at page 9.

### K-series adapter



#### Vehicle-specific singular adapter for radiator-orifices and expansion tanks

Vehicle-specific singular adapter for radiator-orifices and expansion tanks. With nipple for the connection with quick coupling of the radiator pump or the FZ 100K hose.

**Delivery in paper box**

### KS-adapter



#### Vehicle-specific singular adapter for radiator-orifices and expansion tanks

Vehicle-specific singular adapter for radiator-orifices and expansion tanks, made of aluminium. With nipple for the connection with quick coupling of the radiator pump or the FZ 100K hose.

**Delivery in paper box**

### KW-adapter



#### Angular adapter with 90°- angular connector

Angular adapter with 90°- angular connector for motorcycles and restricted access to radiator orifices.

**Delivery in paper box**

### DS-adapter



#### Adapter for cooling cap testing

DS-Adapter are used for leak testing, function testing, valve cleaning of the original radiator filler cap. One end features a vehicle-related thread, while the other is fitted with a connecting nipple for attachment to the cooling system tester.

**Delivery in paper box**

### SZ U

010616

#### Rigid for the connection of cooling system testers



Rigid connector for the connection of cooling system tester with bayonet connection or clamp and vehicle-specific singular adapters K.. or universal adapters UA.. It is also possible to connect pressure pumps of other manufacturers to the LEITENBERGER-adapter System.

**Delivery in paper box**

### FZ 100K

010501



#### Flexible connector

Flexible connector 0.50 m (20 in.) long, connectable; required for restrictive access to radiators and expansion tanks. Connection of cooling system tester and vehicle-specific singular adapters K.. or universal adapters UA.. One end with quick coupling, other end with nipple for quick coupling (for cooling system testers with quick coupling only).

**Delivery in paper box**

### KS-Set 86/90

010950\_1



#### Adapter-Set

Bajonet type adapter set with spring. Fit to the majority of Asian vehicles. Content KS 86 and KS 90.

**Delivery in paper box**

### UA 50

010409



#### Universal adapter with hand wheel for cooling system check

Universal adapter with hand wheel for cooling system check. Can be used for radiator orifices diameter 20...41 mm (3/4...1 5/8") owing to stepped rubber. With nipple for the connection to the radiator pump's quick coupling.

**Delivery in paper box**

### UA 1...4, UA 11...14



#### Universal adapter

The most frequently used universal adapter for cars is the type UA 2 with hand wheel or UA 12 with levers. Securing the adapter in the radiator or expansion tank is effected by depressing the handle into a horizontal position or by turning the hand wheel. All the universal adapters listed also permit the holding pressure to be reinforced by way of the threaded rod.

**Delivery in paper box**

Ø opening in mm	with hand wheel	Ref no	with handle	Ref no
21...38	UA 1	010301	UA 11	010401
19,5...38	UA 1j*	010306	UA 11j*	010406
27...42	UA 2	010302	UA 12	010402
33...50	UA 3	010303	UA 13	010403
26...45	UA 3DB**	010305	UA 13DB**	010405
40...65	UA 4	010304	UA 14	010404

\*for asian makes \*\*for Mercedes Benz vehicles





## CO<sub>2</sub> Leak Detector

Test devices to indicate a leak at the cylinder head gasket or the cylinder head. With 2 test chambers, quick coupling for the connection with our singular adapters K, KS and universal adapters UA. With rubber ball for the quick suction of vapors.

A leak at the cylinder head gasket or the cylinder head is indicated by a change in colour of the reaction liquid from blue to yellow (petrol engines), from blue to green (Diesel engines).

**Note:** reaction liquid environment friendly.

**Attention:** During the CO<sub>2</sub> test the temperature of the cooling system is only allowed to a maximum of + 70 °C.

LT 200.2

030105



**CO<sub>2</sub>-Leak detector with quick coupling**

Accurate and fast diagnosis. Leak detector for cylinder head gasket with 2 test chambers; for Diesel and petrol engines. With quick coupling for the connection with our singular adapters K.. and KS.. as well as universal adapters UA..., with rubber ball for the quick suction of vapors. A leak at the cylinder head gasket or the cylinder head is indicated by a change in colour of the reaction liquid from blue to yellow (petrol engines), from blue to green (Diesel engines). For Diesel und petrol engines with quick coupling. Reaction liquid environment friendly.

- for Diesel und petrol engines
- with quick coupling
- reaction liquid environment friendly

**1 CO<sub>2</sub>-Leak detector LT 200.2**  
**1 bottle reaction liquid (LT 02)**  
**Delivery in paper box**

LT 200.2G

030114



**CO<sub>2</sub>-Leak detector with rubber cone**

CO<sub>2</sub>-Leak detector, version equivalent to LT 200.2, with rubber cone instead of quick coupling Ø 20...45 mm (3/4... 1 3/4").

- universal use
- with rubber cone

LT 450

030101



**CO<sub>2</sub>-Leak detector set**

Leak detector, equivalent version of LT 200.2 with rubber cone, delivery includes reaction liquid (LT 02) as well as rinsing liquid (LT 01).

**1 CO<sub>2</sub>-Leak detector LT 450**  
**1 set reaction liquid/rinsing liquid supplied in a wooden box**

LT 01

030106



**1 set rinsing liquid**

1 set rinsing liquid 100 ml and reaction liquid 250 ml.

**1 bottle reaction liquid (LT 02)**  
**1 bottle rinsing liquid**

LT 02

030107



**1 bottle reaction liquid**

1 bottle reaction liquid 250 ml for LT 200.2 or LT 200.2G.



## Assess of liquid media

Refractometer for different liquids. The following liquids can be proofed:

- Battery acid: gravity of the electrolyte
- Coolant: concentration of antifreeze
- windshield washer fluid: concentration of antifreeze
- AdBlue®\* operating additive: quality

Further refractometers on request.

\*AdBlue® is a registred Trade Mark of VDA, Verband der Deutschen Automobil-industrie e.V. (German Automobile Industry Association).

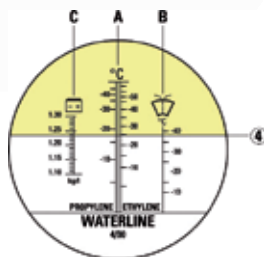
FT 2030

110306\_1



## Refractometer for radiator coolant, battery acid, windshield washer fluid

- 3 functions in 1 tester
- Approved and recommended by BASF
- Suitable for use on coolant additives such as SONAX, G 11, G 12, G 12 Plus, Superplus 2000, Glysantin



Approved by vehicle manufacturers as an accurate and safe check on fluids' condition. Workshop tester (proven ten thousand times over) for checking the concentration of antifreeze (scale A) in coolant or windshield washer fluid (scale B). A LIGHT/DARK dividing line (4) on different scales indicates the temperature in °C (optional in °F), down to which the fluid is protected against freezing.

The specific gravity of the electrolyte in the battery is indicated in kg/l (scale C). Adjustable eyepiece permits adaptation to the user's eyesight. Including pipette. Further refractometers on request.

**Delivery in paper box**

FT 2030 LED

110313\_1

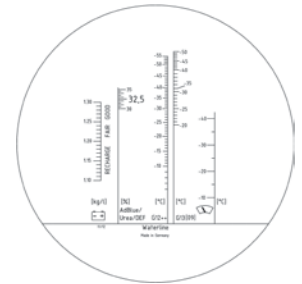


## Refractometer fourfold scale and LED lighting

Refractometer for testing coolant, windshield washer fluid, battery acid and AdBlue®\* operating additive - with additional LED lighting. Workshop tester for accurate and safe check on fluids' condition. Adjustable eyepiece permits adaptation to the user's eyesight.

Switchable LED illumination for use in bad light conditions. Result is easy to read on the dark/light dividing line.

- Refractometer for the testing/evaluation of
- radiator coolant
  - windshield washer fluid
  - battery acid
  - quality of AdBlue®\* operating additive



1 Refractometer with LED lighting

**1 Pipette**

**1 Instruction**

**Delivery in small solid plastic case.**

FT 2030\_AL

110311\_1



## Refractometer in solid aluminium housing for radiator coolant, battery acid, AdBlue®\*

Refractometer to determine the density of fluids in solid aluminium housing. The Refractometer FT 2030 AL indicates the freezing temperature of coolant and wind-screen water, the density of battery acid and the quality of AdBlue®\*.

- Adjustable eye piece
- Unit for four different applications
- Solid aluminium housing
- Very good readability (waterline (4))



**1 x Refractometer**

**1 x Pipette**

**1 x Instructions**

**Delivery in small solid plastic case.**

RFM 02\_AB

110306\_24



### Refractometer for radiator coolant, battery acid, AdBlue®\*

For testing coolant, a light/dark dividing line is shown on the scale, up to which the temperature (in °C) of the coolant is protected. For testing battery acid, the acid concentration is displayed in kg/l and, in turn, broken down into grades such as recharge/fair/good.

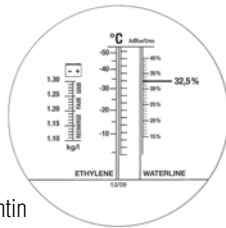
An adjustable eyepiece permits adjustment to the visual acuity of the user. Delivery in paper box complete with sampling pipettes.

Refractometer for the testing/evaluation of

- radiator coolant
- battery acid
- quality of AdBlue®\* operating additive

Suitable for coolant additives such as:

SONAX, G11, G12, G12 Plus, Superplus 2000, Glysantin



**Delivery with pipettes in solid plastic case**

## Notes on AdBlue®\* operating additive

Prolonged storage and high temperatures will cause a creeping decomposition of AdBlue®\* operating additive.

In case of new AdBlue®\* operating additive, the reference line must coincide with the light/dark dividing line. Any displacement of the water line indicates the decomposition of the operating additive.

\*AdBlue® is a registered Trade Mark of VDA, Verband der Deutschen Automobil-industrie e.V. (German Automobile Industry Association).

CD



### Coolant diagnosis

For monitoring the coolant quality in internal combustion engines and technical systems.

Coolant is used for thermal protection and for increasing performance and operating safety in the majority of internal combustion engines that are currently used in motor vehicles, rail vehicles, ships, block-type thermal power stations and industrial systems, for example.

Monitoring of the coolant quality as a preventive measure increases operational safety and reduces the operating costs.

Code	Description	Ref No.
CD 01	The most extensive coolant analysis will be returned 4 - 5 working weeks after receipt of the samples.	110407_1
CD 02	A complete coolant analysis will be returned 2 - 3 working weeks after receipt of the samples.	110407_1
CD 03	A preliminary coolant test will be returned 1 - 2 working weeks after receipt of the samples.	110407_1

PEK 01

110400\_1



### Sample taking kit

With the PEK 01 - the sample taking kit - you can easily and conveniently put liquid samples into the supplied sample bottles. Caution: Not for aggressive acids. Vapours could destroy the pump. It may only be used for substances against which its plastic components are resistant. Please inform yourself about „Chemical Resistance of Plastics“.

A vacuum is created with the manually-operated piston that draws the fluid into the original sample bottle.

**1 PEK 01 pump**

**6 Sample bottles 100 ml**

**6 PE suction hose à 900 mm**

**1 Direction for use**

**Delivery in solid plastic case**

WTS 01\_T



## Flushing device for cooling system and heat exchanger, desktop version

For cleaning and flushing of extracted or built in cooler and/or heat exchanger.

Sedimentary deposition inside the cooling system (cooler/ heat exchanger) are leading to the result that heat cannot be dissipated sufficiently and the unbathed/ unmoistened surfaces are left unprotected against corrosion. The cleaning liquids can be tempered up to +60 °C and a strong pulsating/oscillating pump makes sure the cooler/heat exchanger are flushed thoroughly/best possible. Made out of stainless steel. This makes sure that any cleaning liquids can be used.

Chemicals/cleanser are not included in the delivery. We can offer our knowhow to specify suitable cleaning liquids for the application.

### Further versions of the flushing device:

Code	Description	Ref No.
WTS 01_T_EU	desktop device with 230 VAC power supply	011701_1
WTS 01_T_US	desktop device with 115 VAC power supply	on request

We recommend the cleaning kit G 052 525 A3. This kit consists of 5 l Frostox S (cleanser), 5 l neutralizer and 2 suitable filter mats for WTS 01xx.

KVBA 01

011415\_1



## Automatic Evacuation, Filling and Test System

### Applications:

- rework process
- test benches
- suitable to charge „wet“ and „dry“ systems
- operator independent and reproducible filling results
- automatic or manual processes possible
- creation of Testand/or Filling processes (RD/ process-planning purposes)
- static and dynamic tightness test of cooling systems

### Controller and Operation:

- via graphical user interface of external computer
- the „Admin-level“ allows to create and save new processes
- the „User-level“ allows the „run out“ of processes

### Adaptors:

- The adaptors to the expansion tanks are NOT included in the delivery.
  - We offer a range of ca. 400 different adaptors.
  - Adaptors at 180°, 90° or 90° with a flexible hose are available.
- Please do not hesitate to contact us concerning this issue.

### 1 mobile cart

**1 high performance vacuum pump, 230 VAC, adjustable final vacuum**

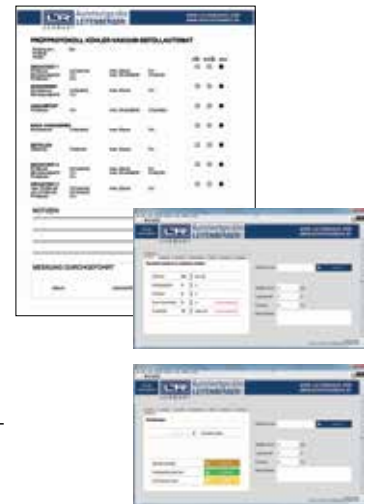
**1 drainage container (to protect vacuum pump)**

**1 Controller-Box**

**2 Hoses á 1.5 m, (for suction and filling)**

**1 x 30 Liter container for fresh coolants**

**without adaptors to the expansion tank**







## SERVICE

Our services

- Development
- Training
- Production
- Spare parts service and repairs
- Sales
- Product care
- Quality management
- Technical advise for customers and dealers
- ISO calibration service and dealers
- Prototype construction



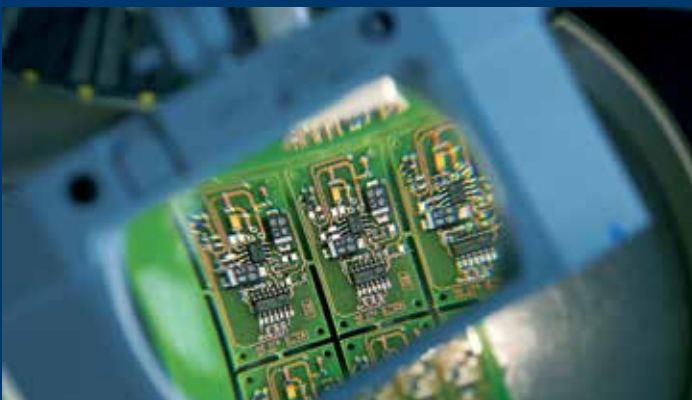
**We produce the majority of our devices and almost all components ourselves. With a production scope which keeps surprising our customers of many years.**



- 3D-print models
- Software programming
- Circuit board configuration
- CNC processing
- Manufacture by customer request
- Screen printing
- Laser printing
- Serial production

We are almost independent from suppliers with this production scope.

Our precision instruments are well packed and therefore safe and easy stored. The solid cases and individually cut inlays underline this promise. Nevertheless our instruments are designed in a way that they can be repaired easily.



Our clients appreciate that and they have our equipment in use for decades.

We program the software for our instruments ourselves and we manufacture the circuit boards in house.

But we can do even more and everything is

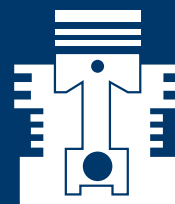
**“MADE IN GERMANY“**

## Cylinder leakage testers and pressure loss tester for petrol and Diesel engines

For the following test devices other adapters are available with different lengths, including versions with clamps for use on commercial vehicles (on request) in addition to the standard connections of spark plug thread M 14x1.25 and M 18x1.5.

- Cylinder leakage testers for petrol and Diesel engines
- Engine pressure-loss tester
- Upper dead point gauge
- Oil pressure testing equipment
- Funnel for topping up engine oil
- Digital thermometers
- Belt tension gauges
- Timing lights for petrol and Diesel engines
- Carburetor tester
- Revolution counter
- Intake System Cleaner

ENGINE



You can find the suitable test adapters in the „Adapter list for compression, pressure loss testers (ZKD)“ on the Internet at: <http://www.autotestgeraete.de/en/service/downloads.html>

QR-code to the adapter lists



## Cylinder leakage testers for petrol and Diesel engines

DRV 02

041103



### Engine pressure-loss tester in metal housing

for petrol and Diesel engines permitting the pinpointing of pressure loss in cylinders. Supplied with additional control knob to increase air admission pressure, facilitating the audible locating of possible leakage point. Before the test is carried out, the engine is adjusted by workshop pressure to a permissible pressure loss (approx. 23 %). If the test instrument needle falls beyond 23%, the pressure loss is unacceptable.

- 1 engine pressure-loss tester DRV 02
- 1 standard test hose, 1,00 m long (3 ft), with quick coupling
- 1 connectable adapter ZKS 01.1
- with spark plug thread M 14x1.25 and M 18x1.5
- Delivery in paper box

DRVD 02

041105\_1



### Digital engine pressure-loss tester in metal housing

The DRVD tester permits the rapid detection of a loss of pressure in an engine. Engine pressure-loss tester for petrol and Diesel engines with connection to workshop pressure. Indicates the cylinders' pressure-loss in percent. Digital pressure gauge, DS 80 mm (3 1/4").

- 1 engine pressure-loss tester DRVD 05
- 1 standard test hose, 1,00 m long (3 ft), with quick coupling
- 1 connectable adapter ZKS 01.1
- with spark plug thread M 14x1.25 and M 18x1.5
- Delivery in paper box

DRV 05

041113



### Engine pressure-loss tester

with connection to workshop pressure.

Indicates the cylinders' pressure-loss in percent. Precision gauge DS 80 mm (3 1/4") with green area (tolerated compressure-loss); robust protective rubber cap.

- 1 engine pressure-loss tester DRV 05
- 1 standard testing hose 1.00 m (3 ft) long, fastened to the gauge, incl. quick coupling for plug
- 1 thread connection ZKS 01.1, thread M 14x1.25 and M 18x1.5
- Delivery in paper box

DRVD 05

041106\_1



### Digital engine pressure-loss tester

for petrol and Diesel engines with connection to workshop pressure.

Indicates the cylinders' pressure-loss in percent. Precision gauge, digital DS 80 mm (3 1/4") with robust protective rubber cap.

- 1 engine pressure-loss tester DRVD 05
- 1 standard testing hose 1.00 m (3 ft) long, fastened to the gauge, incl. quick coupling for plug

DRV 05\_Otto-Set

041113\_8



### Engine pressure-loss tester petrol engines

– especially for petrol engines

- 1 pressure-loss tester DRV 05
- 3 Adapters / petrol engines KPA 08, 09, 10 (flexible)



DRV 05.3

041119



### Engine pressure-loss tester

specification as DRV 05. Test hose 1,00 m long (3 ft), connectable adapter ZKS 01.1 spark plug thread M 14x1.25 and M 18x1.5, additional 2 adapters, see delivery unit.

– especially for motorcycles

- 1 engine pressure-loss tester DRV 05**
  - 1 test hose connectable, length 1.00 m (3 ft)**
  - 1 adapter ZKS 01.1**
  - 1 adapter KPA 01\_Motorrad (040362\_1), spark plug thread M 12x1.25 (male thread)**
  - 1 adapter KPA 02\_Motorrad (040363\_1), spark plug thread M 10x1 (male thread)**
- Delivery in paper box

DRV 05\_FORD

041113\_7



### Engine pressure-loss tester

Indicates the cylinders' pressure-loss in percent. Precision gauge DS 80 mm (3 1/4") with green area (tolerated compressure-loss); robust protective rubber cap.

– with connection to workshop pressure, especially for FORD vehicles.

- 1 engine pressure-loss tester DRV 05 with testing hose 1.00 m (3 ft) long, fastened to the gauge, incl. quick coupling**
  - 1 adapter ET 37.3 (petrol engines)**
  - 2 adapters ZKD 26, ZKD 40 (Diesel engines)**
- Delivery in solid plastic case

DRV 05\_KIA

041113\_4



### Engine pressure-loss tester

Engine pressure-loss tester with connection to workshop pressure. Delivery unit additional with upper dead point tester OT 04. Version in accordance with KIA requirements, with determination of top dead center (TDC).

The included adapters can be used in combination with Leakage tester DRV.. and upper dead point gauge OT 04.

- 1 engine pressure-loss tester DRV 05**
  - 1 standard testing hose 1,00 m (3 ft) long, incl. quick coupling**
  - 4 adapters ZKD 21, ZKD 23, ZKD 24, ZKD 25 (Diesel engines)**
  - 1 adapter ET 37.3 (petrol engines)**
  - 1 flexible adapter KPA 10 (petrol engines)**
  - 1 upper dead point gauge OT 04 (041310\_1) with acrylic cylinder, incl. hose with quick coupling**
- Delivery in solid plastic case

DRV 06

041121\_1



### Engine pressure-loss tester

specification as DRV 05, but with additional gauge for the inlet pressure. Test hose 1 m long (3 ft), connectable adapter ZKS 01.1 spark plug thread M 14x1.25 and M 18x1.5. Other Adapters can be supplied with different lengths, including versions with clamps for use on commercial vehicles (on request).

- 1 engine pressure-loss tester DRV 06**
  - 1 test hose incl. quick coupling, length 1.00 m (3 ft)**
  - 1 gauge DS 50, 0... 16 bar (inlet pressure)**
  - 1 adapter ZKS 01.1**
- Delivery in paper box

## Upper dead point gauge (TDC)

OT 01

041311\_1



### Upper dead point gauge

To achieve the optimum adjustment of ignition timing, the piston's upper dead point has to be found. Specification as OT 04 but detection via acoustic signal.

OT 04

041310\_1



### Upper dead point gauge

Upper dead point gauge. To achieve the optimum adjustment of ignition timing, the cylinder's dead center has to be found. This is particularly difficult, if ignition timing marks are indistinct. By means of a ball in an acrylic glass-pipe with scale, the upper dead center can be found easily. The OT 04 can be used with the same adapters as for the Cylinder leakage testers DRV 05 or DRV 06.

- used in combination with adapters from Leakage Testers
- finding TDC made easy

**OT 04 with acrylic cylinder including 1.00 m (2.9 ft.) hose with quick coupling**

## Intake System Cleaner

EVR 01

041809\_1



### Cleaning Device for Intake Valves and Air-Manifolds

A cleaning process is recommended with every engine-oil change.

EVR 01 is powered by 12 VDC. The special cleaning liquid (suitable for Petrol and Diesel-engines) is injected into the air intake to be cleaned by an implemented pump.

The special nozzle/injector makes sure the cleaning liquid is injected/sprayed with ca. 3 bar. This guarantees the best possible cleaning results at a stationary vehicle with an engine at idle speed.

Via a pushbutton the injection-process is controlled (injected volume of cleaner). Undesired residues on the intake valve and intake channel are resolved and removed. After a successful removal of these residues the engine will run (again) smoothly and powerfully and its exhaust gas values will be in the expected range.

The space in the upper part of the transport case allows the safe storage of all hoses, leads, accessories and spare parts.

**1 EVR 01, cleaning device, built in the very stable carrying case**

**4 Replacement nozzle**

**1 Hose incl. filter (pressure side)**

**1 Cable incl. pushbutton**

**1 Power cable, incl. 12 VDC plug, incl. fuse**

**1 Electric adaptor with battery clips**

We recommend the cleaner:  
TOPCAR Suction System Cleaner  
petrol - or Diesel

[www.topcar-profi.de](http://www.topcar-profi.de)

Website cleanser:





## Compression testers

Compression pressure should be tested on each cylinder in succession at operating temperature and compared with the manufacturer's data. If the results are below the manufacturer's figures, it can be assumed that the piston rings and valves are leaking. In addition to the standard connectors (M 18x1.5 and M 14x1.25 threads), special adapters can be supplied with different lengths and threads, including versions with clamps for use on commercial vehicles.

You can find the list of the available adapters at our website at Service, Downloads, in "Adapter list for compression, pressure loss testers (ZKD)"

For this purpose you also can scan the QR-code.



**KP 80**

**040301\_4**



### Compression tester

Basic device, to connect to any adapter.

- high quality gauge with solid protective rubber cap DS 80 mm (3 1/4")
- flexible hose with integrated pressure check valve and quick coupling
- hose length 250 mm / 98.4 in., with DN5-coupling.
- range 0...40 bar / 0...580 psi

**KPD 80**

**040300\_1**

### Compression tester, digital

Basic device, to connect to any adapter. Digital gauge for easy readout, with solid protective rubber cap, flexible hose with integrated pressure check valve and quick coupling.



- range 0...40 bar / 0...580 psi
- hose length 250 mm
- DN5-coupling

**1 Compression tester KPD 80 with hose and DN5-coupling**  
**Delivery in paper box**

**KP 80\_Otto-Set**

**040390\_4**

### Compression tester for petrol engines

– especially suitable for petrol engines



**1 compression tester KP 80**  
**3 adapters / petrol engines**  
**KPA 08, 09, 10 (flexible)**

**KP 80/4**

**040305\_2**

### Tester to control the cylinder compression chamber of Diesel and petrol engines

Tester to control the cylinder compression chamber of

- Diesel and petrol engines
- range 0...40 bar / 580 psi

High quality gauge with solid protective rubber cap DS 80 mm (3 1/4"), flexible hose with integrated pressure check valve and quick coupling connecting adapters. Additional pressure release valve between hose and gauge.



**1 compression tester KP 80/4, testhose with quick coupling**  
**1 connecting adapter ET 37**  
**1 connecting adapter KPA 01**  
**1 connecting adapter rigid with rubber cone,**  
**1 adapter for connection of other makes**  
**1 adapter for Diesel vehicles ZKD 02**  
**Delivery in paper box**

KP 80/LKW

040396\_1



### Compression tester especially for trucks with Diesel engines

- especially for trucks
- range 0...40 bar / 580 psi

High quality gauge with solid protective rubber cap DS 80 mm (3 1/4"), flexible hose with integrated pressure check valve and quick coupling. Additional pressure relief valve between hose and gauge allows a repetition of the test.

**1 compression tester KP 80 LKW, test hose with quick coupling**  
**10 adapters ZKD 28, 29, 30, 31, 32, 33, 34, 35, 36 and 37**  
**Delivery in solid plastic case**

KP 80/3A

040304\_2



### Tester for Diesel engines to control the cylinder compression chamber of trucks, marine and industrial engines

- range 0...60 bar

High quality gauge with solid protective rubber cap DS 80 mm (3 1/4"), flexible hose with integrated pressure check valve including spark plug connecting part with external thread M 14x1.25 and M 18x1.5, additional adapter ZKD 02 thread M 24x2. An additional pressure release valve between hose and gauge allows a repetition of the test without dismounting of the instrument from the engine. Available with an ISO certificate of calibration (at extra charge).

**1 compression tester KP 80/3A, test hose with standard connection**  
**1 adapter ZKD 02**

KP 80/2A

040302\_2



### Compression tester for Petrol engines of passenger cars, trucks and motorcycles

- for passenger cars, trucks and motorcycles
- range 0...25 bar

High quality gauge with solid protective rubber cap DS 80 mm (3 1/4"), flexible hose with integrated pressure check valve including spark plug connecting part with external thread M 14x1.25 and M 18x1.5, additional adapter KPA 01 thread M 12x1.25. An additional pressure release valve between hose and gauge allows a repetition of the test without dismounting of the instrument from the engine. Available with an ISO certificate of calibration (at extra charge).

**1 compression tester KP 80/2A, test hose with standard connection**  
**1 adapter KPA 01**  
**Delivery in paper box**

KPD 01

040328\_1



### Universal compression tester with digital display

for Diesel and petrol engines. Available with an ISO certificate of calibration.

- measuring range 0...870 psi
- resolution 1 psi
- measuring accuracy  $\pm 0.5\%$  FSO, IEC 60770
- 12 V supply voltage
- illuminated LC display
- with memory and RS 232 interface
- measurement results are displayed in %, psi or with bar graph

1 digital compression tester

**1 pressure sensor with connecting cable**

**1 alimentations cable**

**1 USB interface cable, length 1.80 m (6 ft)**

**7 adapter for petrol engines,**

**ET 35, ET 36, ET 37.3, ET 37.4, ZKS 01.1, KPA 01, KPA 02,**

**5 adapters for Diesel engines,**

**ZKD 01, ZKD 02, ZKD 06, ZKD 07, ZKD 08**

**1 angular adapter ET 285**

**Delivery in solid plastic case**

KPD 01.1

040328\_2



### Universal compression tester 12 V with digital display

for Diesel and petrol engines, equivalent version of KPD 01 but without adapters.

1 digital compression tester

**1 pressure sensor with connecting cable**

**1 alimentations cable**

**1 USB interface cable, length 3.00 m (10 ft)**

**Delivery in paper box**

**KP 63A\_Scooter****042806\_1****Compression tester for scooters**

with high quality gauge, Diam. 63 mm, including rubber protection, measuring range 0 to 16 bar. The flexible hose is fitted with a pressure release valve and quick coupling.

The included angled adapter ET 285 can be coupled between hose and adapter and is needed at limited space situations under the hood.

– suitable for scooters with spark plug thread M 14x1.25

**1 compression tester KP 63A\_Scooter with test hose**  
**1 hose adapter M 14x1.25 (length 110 mm)**  
**1 angular adapter ET 285**  
**Delivery in solid plastic case**

**KP 80/5\_Opel****040390\_3****Compression tester for Diesel and petrol engines for Opel vehicles**

with high quality gauge with solid protective rubber cup DS 80 mm (3 1/4"), flexible hose with integrated pressure check valve and quick coupling connecting different adapters. Additional pressure release valve between hose and gauge.  
 – especially for OPEL vehicles  
 – range 0...40 bar / 0...580 psi

**1 compression tester KP 80/5\_Opel, test hose with quick coupling**  
**2 adapters KPA 09, KPA 10 (petrol engines)**  
**3 adapters ZKD 41, ZKS 42, ZKD 43 (Diesel engines)**  
**Delivery in solid plastic case**

**KP 80/5\_JLR\_1****040393\_1****Compression tester for Diesel and petrol engines for Jaguar and Land Rover vehicles**

with high quality gauge with solid protective rubber cup DS 80 mm (3 1/4"), flexible hose with integrated pressure check valve and quick coupling connecting different adapters. Additional pressure release valve

between hose and gauge.

– especially for JAGUAR and LAND ROVER vehicles  
 – range 0...40 bar / 0...580 psi

**1 compression tester KP 80/5\_JLR\_1, test hose with quick coupling**  
**1 adapter ET 37.3 (petrol engines)**  
**5 adapters ZKD 01, ZKD 16, ZKD 20, ZKD 48, ZKD 49 (Diesel engines)**  
**Delivery in solid plastic case**

**KP 80/5****040331****Compression tester for Diesel and petrol engines, 0-40 bar**

Tester to control the cylinder compression chamber of

– Diesel and petrol engines  
 – range 0...40 bar / 580 psi

By means of this tester comparative measurements of the compression of individual cylinders can be effected. Precision gauge DS 80 (3 1/4") with robust protective rubber cap. Connecting hose for gauge 0.35 m (13.8 in.) with quick coupling. Additional pressure release valve between hose and gauge.

**1 compression tester KP 80/5, test hose with quick coupling**  
**7 adapter for petrol engines,**  
**ET 35, ET 36, ET 37.3, ET 37.4, ZKS 01.1, KPA 01, KPA 02,**  
**5 adapters for Diesel engines,**  
**ZKD 01, ZKD 02, ZKD 06, ZKD 07, ZKD 08**  
**1 angular adapter ET 285**  
**Delivery in solid plastic case**

**KP 80/41****040324\_2****Compression tester for Diesel and petrol engines in solid plastic case**

Equivalent version of KP 80/4, but supplied in solid plastic case.

DRV-KP-Kit 01

041122\_1



## Compression and pressure loss tester for petrol engines.

– adapter for Diesel engines on request  
Description see DRV 05, KP 80 and OT 01.

**1 DRV 05\_solo**

**1 KP 80**

**1 OT 01**

**3 KPA-Adapter**

**Delivery in solid plastic case**

## Oil pressure testing equipment

You can find the list of the available adapters at our website at Service, Downloads, in "Adapter list for oil pressure testers (OP)".

For this purpose you also can scan the QR-code.



OP 85

040592\_1



## Tester for oil pressure check

Connected instead of the oil pressure switch.

- double scale 0...10 bar / 0...140 psi
- supplementary adapters available

Precision gauge DS 80 mm (3 1/4") with robust protective rubber cap.  
Gauge hose 1.00 m (3.3 ft) long with quick coupling.

Available with an ISO certificate of calibration (at extra charge).

**1 oil pressure tester OP 85, test hose with quick coupling**

**10 adapters ANK**

**1 angular adapter ET 285**

**Delivery in solid plastic case**

## Check out our range of oil suction devices:

Chapter PUMPS, pumps for oil suction, HAP  
Chapter BRAKE SYSTEM, Vacuumbox VB 01, VB 01.1



## Topping up engine oil

Oil filler funnel made out of strong plastic with sealing connection for the easy, clean topping-up of engine oil.

The funnel is invaluable for preventing contamination through spilled oil and the resultant smell when topping up oil in the engine compartment.

- clean and environmentally friendly
- time saving
- choice of adapters

EFT 01.1

040603\_2



### Topping-up funnel made of strong plastic and adapter with bayonet fitting

Oil filler funnel made out of strong plastic with sealing connection for the easy, clean topping-up of engine oil. Capacity approx. 1 liter. With bayonet adapter.

Suitable for use with the following makes of car:  
Audi, BMW, Dodge, Mercedes, Benz, Toyota, VW etc.

1 EFT 01 topping-up funnel, capacity approx. 1 litre

1 EFTA 01 adapter with bayonet fitting

EFT 02

040604\_1



### Topping-up funnel made of strong plastic with bayonet fitting

Topping-up funnel made of strong plastic with bayonet fitting for the easy, clean topping-up of engine oil. Capacity approx. 1 litre.

Suitable for use with the following makes of car:  
Audi, BMW, Dodge, Mercedes, Toyota and VW.

**Note:** EFT 02 is not useable with EFTW 01 angled extension.

EFT-Set

040616\_1



### Oil filler funnel set

Engine oil filler funnel set. Contains 5 adapters, aluminium angled extension, delivery in robust plastic case.

#### Topping-up funnel EFT 01

EFTA 01 for Audi, BMW, VW, Dodge, MB, Toyota

EFTA 02 for Porsche

EFTA 03 for Toyota, Lexus

EFTA 05 for Subaru

EFTA 07 for Honda, Nissan

EFTW 01 aluminium angled extension

Delivery in solid plastic case

EFTW 01

040608



### Aluminium angled extension

For confined spaces in the engine compartment, the aluminium EFTW 01 angled extension is the ideal accessory. To facilitate use, the extension rotates and the angle can also be adjusted. It is simply installed between the adapter and the topping-up funnel.

## EFTA



### Adapters for oil filler funnel

Suitable for different makes. For secure and tight connection between the funnel and oil tank.

Code	Ref. No.	suitable for use with
EFTA 01	040604	Audi, BMW, Dodge, Mercedes Benz, Toyota, VW
EFTA 02	040609	Porsche
EFTA 03	040605	Lexus, Toyota
EFTA 04	040610	Ford
EFTA 05	040606	Subaru
EFTA 07	040607	Honda, Nissan
EFTA 09	040613_1	Audi A3, Golf 7, Seat Leon (MQB)
EFTA 10	040617_1	Audi A3, Golf 7, Seat Leon (MQB)
EFTA 12	040624_1	BMW, Mini, Toyota
EFTA 13	040625_1	Mercedes Citan, Renault Kangoo
EFTA 14	040626_1	Mercedes OM 270/271 (Otto)
EFTA 15	040627_1	Mercedes OM 654 (Diesel)
EFTA 16	040628_1	Ford (Ford-Org.TI.Nr. 1871610)

## FOP 01

040618\_1



### Filter opening tool

To open all oil and fuel filters with sheet metal housing and diameter from 40 - 120 mm. After opening the filter element can be removed and checked for abrasion and soiling. Available in different colors.

- adjustable cutting edge
- ball bearing holder
- suitable also for filters with bolt

Delivery in paper box

## VBA



**Adapter for extracting engine oil, usable in conjunction with Vacuum box VB 01/VB 01.1**

Adapter for extracting engine oil, usable in conjunction with VB 01/VB 01.1. On late car models the dip stick leads to the bottom of the oil pan in its own pipe. The VB adapters can be fixed to the pipe opening and engine oil can be sucked without using a lift.

Description of Vacuum box VB 01 see chapter BRAKES.

### Application:

Code	Ref No.	suitable for
VBA 011	100804_1	Mercedes Benz
VBA 012	100805_1	VW
VBA 013	100806_1	BMW



Delivery in paper box

## OEL



### Oil filter wrench Ford Diesel and petrol engines

For loosening and tightening the new oil filter cartridges made of metal.

In case of confined spaces in the engine compartment, this tool allows to reach the oil filter cartridges easy. The special aluminium design allows more torque without slipping.

- fits tight on filter
- for wrenches and sockets with hexagon holder
- safe grip
- high quality aluminium version



Code	Ref No.	suitable for
OEL_01	400074_2	Ford 2.0 Liter Diesel, Focus from 2014, Mondeo from 2014, S-Max from 2015, Galaxy from 2015, Kuga from 2014, C-Max from 2015
OEL_02	400075_2	Ford petrol engines, from 1.2 l (EcoBoost as well), all models, all years



## Digital thermometers

AR 300

110401



### Digital, proximity-type infrared thermometer

Digital, proximity-type infrared thermometer for mobile purposes.

#### Applications:

Air conditioning and refrigerating systems, engines, cooling systems, ball bearings, tyres and brakes, electrical and electronic systems.

- test range from  $-18\text{ }^{\circ}\text{C}$ ... $+315\text{ }^{\circ}\text{C}$
- convertible from  $^{\circ}\text{C}$  to  $^{\circ}\text{F}$
- response time 1 sec.
- measuring accuracy  $\pm 2\%$
- power supply by 9 V monobloc battery
- low battery indication

#### Delivery in paper box

TP 82

040102



### Digital thermometer

Digital thermometer, for testing of the temperature of oil, 3-digit LC display, accuracy  $\pm 2\%$  of the total range.

Available with an ISO certificate of calibration (at extra charge).

- range  $-40\text{...}+110\text{ }^{\circ}\text{C}$
- sensor cable length 1.50 m (4.3 ft)
- flexible sensor  $\varnothing 5\text{ mm}$  (1/4")
- power supply by 1.5 V Mignon battery

#### Delivery in paper box

AR 203\_LR

110210\_2



### Digital second thermometer

Digital second thermometer with 3 1/2 digit LC display. Surface/dip in and air/gas probe allows its universal use for surfaces, liquids, air and gas. The probe connecting lead is equipped with a plug and can be disconnected from the thermometer.

- temperature range  $-65\text{...}+500\text{ }^{\circ}\text{C}$
- resolution  $1\text{ }^{\circ}\text{C}$
- sensor cable length 1.00 m (3.3 ft)
- power supply by 9 V battery

#### Delivery in solid plastic case

## Carburetor tester

VE 01

050101



Example:



### Vacuum gauge

For the exact adjustment of multiple carburetor engines.

High quality vacuum gauge DS 60 mm (2 1/2"),  $-1\text{...}0\text{ bar}$ . The VE 01 can be supplemented piecewise with several vacuum gauge in order to control all carburetors with a single device. This allows a comparison of all carburetors.

**1 vacuum gauge, range  $-1\text{...}0\text{ bar}$**   
**1 hose PVC length 0.60 m (2 ft)**

#### Delivery in paper box



## Belt tension gauges

Toothed belt tension tester permitting the testing of toothed belt tension on almost every cars and motorcycles.

After the sensor has been attached to the belt, its tension is recorded in the form of longitudinal force (Newtons) in accordance with the principle of pressure testing.

**DZP 01, DZP 01.1**

**041501\_1, 041501\_4**



### Tester with digital display for checking the tension of toothed belts

DZP 01, Tester with digital display for checking the tension of toothed belts. Clamping the belt in a metal sensor brings up the tension in Newton. This measurement has to be compared with the manufacturer's data.

- 3 1/2 digit display
- range 0 to 500 Newtons
- resolution 10 N
- low battery indication
- automatic cutout
- power supply by 9 V monobloc battery
- cable length 1.00 m (3.3 ft)

DZP 01.1, Timing belt tester as DZP 01, but with special sensor for hidden belts.

**Delivery in solid plastic case**

## Revolution counter

**MT 6000**

**041001**



### Digital hand tachometer for revolution measures effected without contact

The multifunctional digital hand tachometer is a robust high-quality tester for revolution measures effected without contact as well as for contact-measures of revolutions and speed. Extensive range and automatic memory of results.

- range of 0.5...100 000 RPM and up to 2000 m/min
- 5-digit LC display, 7-segments digits 10.2 mm high
- accuracy  $\pm 0.05\%$ ,  $\pm 1$  digit of the measurement
- power supply by 4 pcs. Mignon R6 1.5 V

#### Ranges contact measure:

- 5...19999 RPM,
- 0.05...1999.9 m/min
- 0.2...6560 feet/min

#### Contactless measure:

- 5...99999 RPM

#### 1 detector

**1 ring gear wheel and 0.60 m (24 in.) reflecting tape**

**1 rubber contact piece**

**1 storage bag with foam material inlet**

To adapter list EFTA:

A detailed list of EFT adapters can be found on the Internet at:  
[www.autotestgeraete.de/service/downloads](http://www.autotestgeraete.de/service/downloads)







Dosing pump



Pump for generating pressure



Pump for vacuum and pressure generation



Hand made, manually-tested

## Vacuum and pressure pumps

Vacuum and pressure pumps for testing all vacuum applications in a vehicle.

### Possible use:

- Carburetor
- A/C system
- Central locking
- Modulator at automatic gear boxes
- Servo brake
- Exhaust recirculation valve
- All actuators working with vacuum
- Ignition
- Heating valves
- Automatic switch off at Diesel vehicles
- Fuel pressure regulator
- Pressure control at turbo loader
- Throttle
- Membrane of injection pump

### PUMPS



QR-code on the topic of pumps



## Vacuum and pressure pumps

HV 84

060103\_1



### Vacuum pump, graduated in 0.05 bar steps

Aluminium version, for the testing of all vacuum areas in vehicles. High quality vacuum meter with robust protective rubber cap DS 63 mm (2 1/2"), range -1...0 bar graduated in 0.05 bar steps and -760...0 in mmHg. Plastic hose and bilateral conical brass adapter. Vacuum decreasing is achieved by means of the set screw.

- one hand operated
- vacuum meter with 0.05 graduation
- with vacuum regulator

#### Applications:

- carburetors
- ignition systems
- air conditioning systems
- heating baffles
- central locking systems
- automatic cutout (Diesel engined vehicles)
- modulators (automatic transmissions)
- servo-assisted brakes and all vacuum operated actuators

#### 1 vacuum pump

1 hose transparent Ø 5x2 mm, length 0.50 m (20 in.)

1 conical brass adapter

Delivery within textile bag

HV 90

060107



### Vacuum and pressure pump, graduation 0.1 bar

Aluminium version, reversible from vacuum to pressure measures. For the use in various fields on the automotive testing sector. One hand operated, all metal version. High quality compound gauge with robust protective rubber cap DS 63 mm (2 1/2"), dual precision scale, minus-range -1...0 bar, plus-range from 0...+3 bar / 42 psi, graduation 0.1 bar.

- one hand operated
- reversible vacuum or pressure
- range - 1...+3 bar / 42 psi, fine graduation

#### Applications vacuum range:

- vacuum meter sensor check
- exhaust gas recirculation valve check
- throttle valve check
- fuel pressure regulator check
- vacuum modulator check (automatic transmissions)
- servo-assisted brake check

#### Applications pressure range:

- injection pump diaphragm check
- turbocharging pressure check

#### 1 vacuum and pressure pump HV 90

1 hose transparent Ø 5x2 mm, length 0.50 m (20 in.)

1 conical brass adapter

4 connecting adapters made out of plastic

Delivery in solid plastic case

HV 90.6

060107\_6



### Vacuum and pressure pump

Vacuum and pressure pump like HV 90, but including a 120 ml collecting tank HVZ 02, hoses and adapters.

- 1 vacuum and pressure pump**
- 1 hose transparent Ø 5x2 mm, length 0.50 m (20 in.)**
- 1 conical brass adapter**
- 4 connecting adapters made out of plastic**
- 1 collecting tank HVZ 02**
- Delivery in solid plastic case**

HV 95

060108



### Vacuum and pressure pump with change-over ring

Vacuum and pressure pump, combination in material of aluminium and plastic, change-over from pressure to vacuum range by means of a change-over ring. Precision compound gauge with protective rubber cap DS 60 mm (2 1/2").

- reversible vacuum or pressure
- vacuum range -1...0 bar / 760 mmHg
- pressure range 0...+3 bar / 42 psi

- 1 vacuum and pressure pump HV 95**
- 1 hose transparent Ø 5x2 mm, length 0.50 m (20 in.)**
- 1 conical brass adapter**
- 4 connecting adapters made out of plastic**
- Delivery in paper box**

KDV 01

060109



### Combination pump for pressure and vacuum with change-over ring

2 functions - 1 pump

Combination pump for pressure and vacuum with change-over ring. Compound gauge DS 63 mm (2 1/2") with robust protective rubber cap and with dual fine scale.

- vacuum range -1...0 bar / 760 mmHg
- pressure range 0...3 bar / 42 psi, fine graduation 0.1 bar

#### 2 operational alternatives:

- as pressure pump for cooling system
- as vacuum pump for checking vacuum functions in the vehicle

- 1 combination pump KDV 01**
- 1 flexible hose FZ 100 K, connectable**
- 1 hose transparent Ø 5x2 mm, length 0.50 m (20 in.)**
- 1 conical brass adapter**
- 4 connecting adapters made out of plastic**
- Delivery in paper box**

HVZ 02

060111\_1



### Collecting tank (120 ml) with hose connection for pressure and vacuum pumps

- Collecting tank (120 ml)
- cover with hose connection
- hose length 0,50 m (20 in.)

## Oil suction program with collecting tank

HAP 01.1

060410



### Pressure and vacuum pump, for the suction, the refilling and the scavenge of gearbox-oil

The facility for extracting and refilling gearbox oil is provided by two connecting nipples.

- pressure performance min. 2 bar
- vacuum performance appr. 0.8 bar
- 2 connections pressure or vacuum
- used in conjunction with collecting tank HAP 15

A container HAP 15 with contents scale (1.5 l capacity), which can be connected to the unit, permits the temporary storage of the oil.

Delivery in paper box

HAP 01.2

060411\_1



### Vacuum pump with transparent hose connectable

Can be used in combination with collecting tank HAP 15 (not included).

- vacuum performance 0.85 bar
- length of hose 0.50 m
- used in conjunction with collecting tank HAP 15

1 HAP 01.2 vacuum pump

1 transparent suction hose, 0.50 m long (20 in.) with nipple

Delivery in paper box

HAP 15

060408



### Collecting tank, oil resistant, volume 1.5 l

Provided with scale in 50-ml-graduation. Connection with Hand pumps HAP 01.1 and HAP 01.2 is effected by means of quick coupling.

1 collecting tank HAP 15

1 transparent suction hose, 2.00 m long (6.6 ft).

Delivery in paper box

HAP 03

060406



### Oil suction pump and collecting tank

The set consist of

- vacuum pump HAP 01.2 (060411) and
- collecting tank HAP 15 (060408)

HAP 05

060404



### Oil suction pump and collecting tank

The set consist of

- pressure and vacuum pump HAP 01.1 (060410) and
- collecting tank HAP 15 (060408)

GFP 01 , GFP 01.1

060430\_1 , 060430\_3



### Gear oil filling pump

with light metal construction, ideal for filling various manual transmission types, transfer gearboxes and differentials with gear oil.

The various GFPA gear oil filling adapters can be used for diverse vehicle manufacturers and can be safely and rapidly replaced via a quickconnect coupling at the filling hose. Discharge-safe work is possible with the closable ball valve.

A plastic container with scale and 10 litre capacity enables filling in one work process. Further adapters see table page 84.

Scope of supply GFP 01 (060430\_1):

1 gear oil filling pump GFP 01 with filling hose, length 2.00 m (6.6 ft)

1 plastic container, 10 litre capacity

5 gear oil filling adapters GFPA 03, 04, 05, 06, 07

Scope of supply GFP 01.1 (060430\_3) - supply without adapters

1 gear oil filling pump GFP 01 with filling hose, length 2.00 m (6.6 ft)

1 plastic container, 10 litre capacity



## Hand-operated transfer pumps

HAP



### Hand-operated transfer pumps with twin connections

Connection on suction side with loose G 3/8 union nut and hose nipples for hoses of 10/15 mm internal diameter.

#### Different models available:

Code	Ref. No.	pump capacity
HAP 125	060414_1	125 ml
HAP 250	060415_1	250 ml
HAP 600	060412_1	600 ml

#### 1 HAP hand transfer pump

1 transparent suction hose 0.50 m long (20 in.)

1 transparent delivery hose 0.50 m long (20 in.)

Delivery within plastic bag

HAP 600F

060412\_3



### Hand-operated transfer pump with baseplate and twin connections

Connections on suction and delivery sides for hoses of 10/15 mm internal diameter.

– Pumping capacity 600 ml per stroke

#### 1 HAP 600F hand transfer pump

1 transparent suction hose 0.50 m long (20 in.)

1 transparent delivery hose 0.50 m long (20 in.)

Delivery within plastic bag

## Hand pump range

The range of hand pumps includes transfer, suction and metering pumps.

They are suitable for extracting or transferring fluids such as: brake fluid, Diesel, heating oil, various types of oil (hydraulic fluid, engine oil, machine oil, synthetic oil) and water.

**Caution:** Not suitable for petrol, acids or alkaline solutions!

A precision engineered tubular cylinder and perfectly matched plunger guarantee ease of movement and, in turn straightforward use in practice.

#### Hand transfer pumps HAP:

Twin connections on the cylinder permit fluids to be transferred in a single operation. Pulling the handle causes the fluid to be drawn into the pump cylinder via the suction side, then discharged through the delivery side when the handle is depressed. In the case of the HAP 600F and HAP 3000F models, the pumping process is made easier by the presence of a baseplate. Pumps cylinder made of aluminium, sealing caps of plastic.

#### Hand suction pumps HAP 02:

With this type of pump, the extracted fluid remains in the pump cylinder until it is discharged. Pump cylinder made of aluminium, sealing caps of plastic.

#### Hand metering pumps HDP:

A Plexiglass pump cylinder with graduated scale permits the precise, controlled extraction or filling of fluids. Caution: Not suitable for brake fluid!



HAP 3000F

060413\_1



### Hand-operated transfer pump with baseplate and twin connections

Connections on suction and delivery sides for hoses of 20/22 mm internal diameter.

– Pumping capacity 3000 ml per stroke

- 1 HAP 3000F hand transfer pump
- 1 transparent suction hose 1.00 m long (3.3 ft)
- 1 transparent delivery hose 1.00 m long (3.3 ft)
- Delivery within plastic bag

HAP 500T

060428\_1



### Hand-operated transfer pump with twin connections

Sealing caps made of Aluminium. The Plexiglass pump cylinder with graduated scale from 0 to 500 ml (10 ml graduation), permits a controlled dosing of fluids.

– Pumping capacity 500 ml per stroke.

**Caution:** Not suitable for brake fluid!

- 1 HAP 500T hand transfer pump
- 1 transparent suction hose 0,50 m long (20 in.)
- 1 transparent delivery hose 0,50 m long (20 in.)
- Delivery within plastic bag

## Hand suction pump

HAP 02

-



### Hand suction pump, 125 - 1000 ml

For different models available:

Code	Ref. No.	pump capacity
HAP 02_125	060414_2	approx. 125 ml
HAP 02_250	060403	approx. 250 ml
HAP 02_600	060412_2	approx. 600 ml
HAP 02_1000	060416_1	approx. 1000 ml

- 1 HAP 02 hand transfer pump with hose connection
- 1 transparent suction and delivery hose, 1.00 m long (3,3 ft)

Delivery within plastic bag

## Hand metering pump

HDP

-



### Hand metering pumps HDP - Plexiglass

Four different models available:

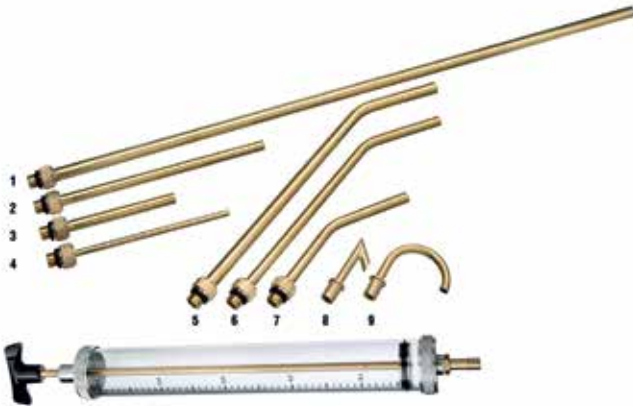
Code	Ref. No.	pump capacity
HDP 125	060417_1	approx. 125 ml
HDP 500	060418_1	approx. 500 ml
HDP1000	060419_1	approx. 1000 ml
HDP 2000	060429_1	approx. 2000 ml

- 1 x HDP hand metering pump with hose connection
- 1 transparent suction and delivery hose, 1.00 m long (3.3 ft)
- 1 ET 729 hose, Ø 5 x 2, 1.00 m long (3.3 ft), with hose connector

Delivery within plastic bag

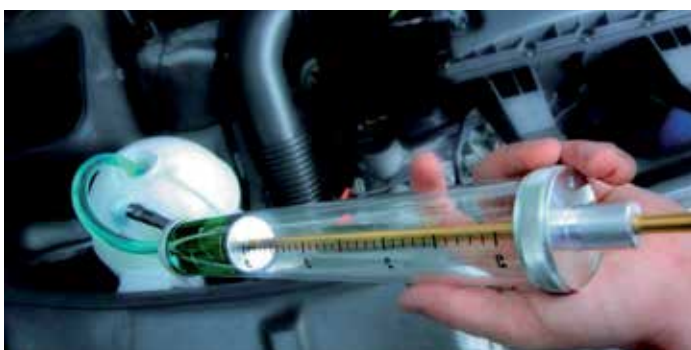
## Accessories for manual vacuum extraction and metering pumps

### HAPA-Adapter



### Adapters for manual extraction and metering pumps

No.	Code	Ref No.	Description
1	HAPA_G 600/10	060420_1	straight adapter, length 600 mm (23.6 in.), Ø 10
2	HAPA_G 200/10	060420_2	straight adapter, length 200 mm (7.9 in.), Ø 10
3	HAPA_G 90/10	060420_3	straight adapter, length 90 mm (3.5 in.), Ø 10
4	HAPA_G 130/6	060420_4	straight adapter, length 130 mm (5.1 in.), Ø 6
5	HAPA_W 250/10	060420_5	angled adapter 30°, length approx. 250 mm (9.8 in.), Ø 10
6	HAPA_W 200/10	060420_6	angled adapter 30°, length approx. 200 mm (7.9 in.), Ø 10
7	HAPA_W 130/10	060420_7	angled adapter 30°, length approx. 130 mm (5.1 in.), Ø 10
8	HAPA_SW 135/8	060421_2	angled adapter, short 135°, Ø 8, with hose line connector
9	HAPA_SD 180/8	060421_1	curved adapter 180°, Ø 8, with hose line connector



## Barrel suction pumps

HAP 21\_MK

060427\_2



### Barrel suction pump case-set

with 1/4 SAE connection with aluminum design. Can be used for media such as various types of oil, non-flammable and non-aggressive liquids. Corrosion-free, maximum achievable pressure 30 bar, pump volume 400 ml/stroke.

- 1 barrel suction pump with ET 577 sealing cone (111623)**
- 1 refrigerant hose, 1/4 SAE connection, length 0.90 m (3 ft)**
- 1 G 1/4 suction hose, length 1.00 m (3.3 ft)**
- 1 sealing cone set (3 pcs) GKS 02**

GKS 02

010411\_5



### Sealing cone set

Accessory for barrel suction pump HAP 21.

For sealing off other container sizes.

- Height 40 mm, Ø internal: 9,5 mm for suction hose (060427\_4).
- Ø 30/15 mm
- Ø 40/20 mm
- Ø 50/35 mm

HAP 21C\_S02

060427\_4



### Suction hose

Accessory for barrel suction pump HAP 21.

PVC suction hose G 1/4, length 1.00 m (3.3 ft)

HAP 21C

060427\_1



### Barrel suction pump with 1/4 SAE connection in aluminum design

Can be used for media such as various types of oil, non-flammable and non-aggressive liquids.

- corrosion-free
- maximum achievable pressure 30 bar
- pump volume 400 ml/stroke

**Caution:** Cannot be used for gasoline, acids and caustic solutions!

When using the hand pump, it is possible, for example, to pump oil directly out of the container into the crankcase of a refrigeration compressor. Thanks to the integrated sealing cone, the pump seals off the container and can remain on the container until it is completely emptied.

The GKS 02 sealing cone set and the HAP 21C\_S02 suction hose are available for sealing off other container sizes.

**1 barrel suction pump with ET 577 sealing cone**  
**Delivery in paper box**

**More pumps**, e.g. for for the suction, the refilling and the scavenge of gearbox-oil and filling of the gearbox or differentials you can find in the chapter TRANSMISSION at page 80: GFP 01, GFP 01.1 and HAP 01.1.

HAP 20

060426\_1



### Vacuum extraction pump, made of aluminium

suitable for use with fluids such as

- Diesel, oils, water, etc.
- with integrated filter
- height adjustable
- pump volume per stroke: 300 ml

**Caution:** Cannot be used for gasoline, acids and caustic solutions!

For the extraction process, insert the vacuum pipe into the opening of the container (canister, drum) until it reaches the bottom. The pump is supplied with a vertically adjustable foot, permitting use with containers of a variety of sizes. The manually operated pump, with an integrated filter in the suction pipe, can be used with openings of 45 mm in diameter and upwards.

**Supplied with a transparent pressure hose, diameter 20 mm, with screw coupling, length 1.40 m (4.9 ft).**





# Accurate, digital pressure measurement



UDD 01\_LR\_S\_Set

040333\_1

## Universal digital pressure measurement

### Pressure measurement range:

-1 bis +16 bar

0...60 bar

0...600 bar

0...2500 bar

### Applications:

Vacuum, Oil pressure, Fuel pressure

Compression

Hydraulic

Common Rail, Hydraulic

Version UDD 02\_LR\_S, with 2 pressure sensors, allows two pressure measurements at the same time. The differential pressure measurement needs two sensors with the same pressure measurement range.



DM 100\_0/2500bar\_LR1

041932\_1

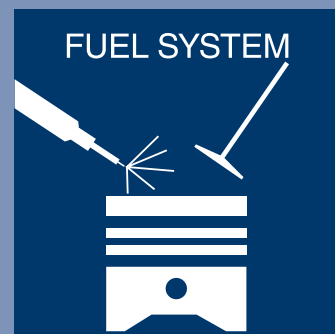


Customized esample

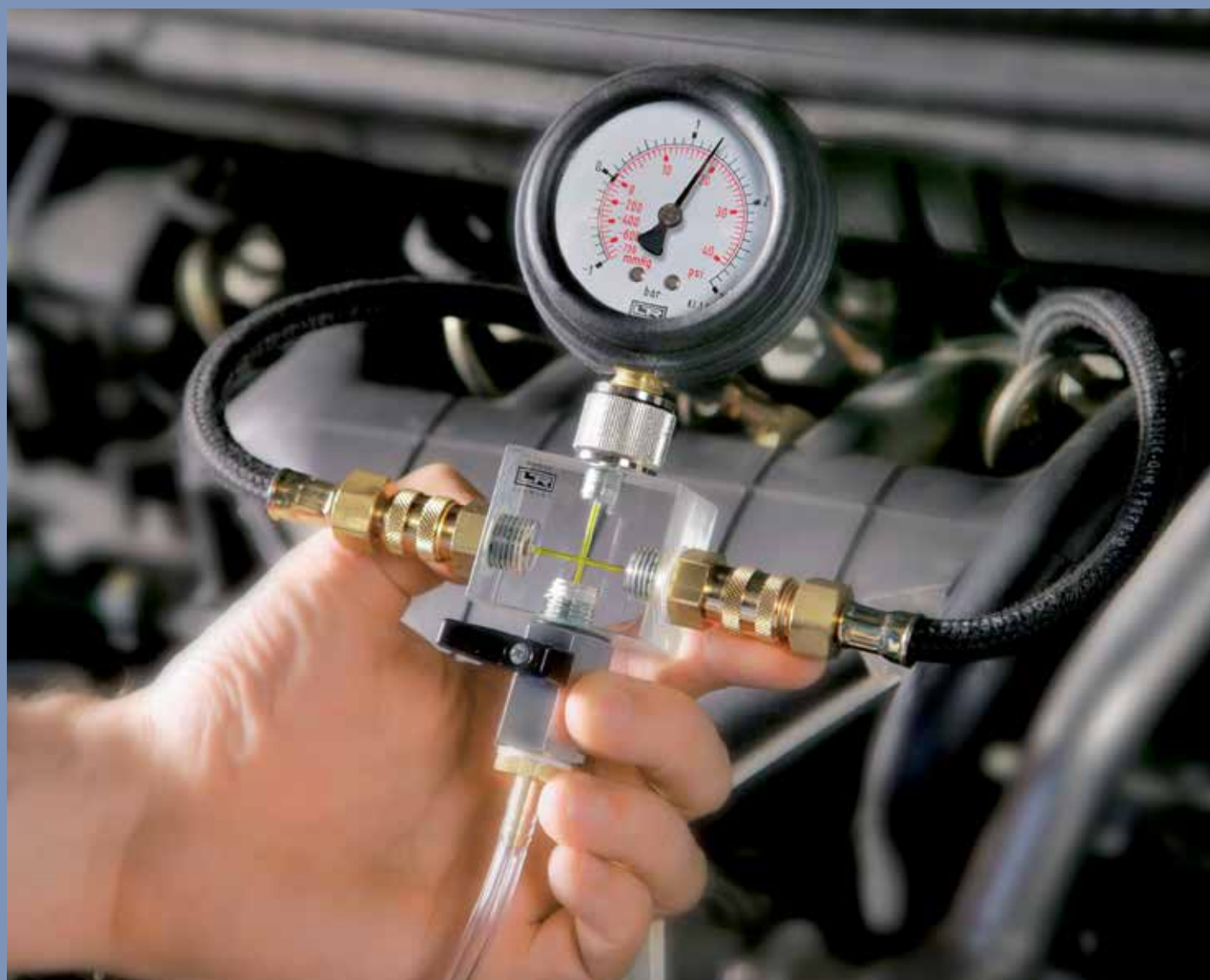
Code	Ref No.	Measurement range	Overload pressure	Burst pressure
DM 100_-1/16bar_LR1	041930_1	-1...16 bar	32 bar	40 bar
DM 100_0/60bar_LR1	041931_1	0...60 bar	120 bar	150 bar
DM 100_0/600bar_LR1	041924_2	0...600 bar	1200 bar	3000 bar
DM 100_0/2500bar_LR1	041932_1	0...2500 bar	4000 bar	5000 bar
DM 100_-50/50mbar_LR1	041933_1	-50...50 mbar	1 bar	1 bar
DM 100_-200/200bar_LR1	041934_1	-200...200 mbar	5 bar	5 bar

## Checking the fuel system

- Common Rail high pressure testing
- Static and dynamic high-pressure pump testing
- Injector function test, dribbling, pressure loss, etc.
- Defective injector
- Return flow volume measurement
- Fuel identification
- Injection testers
- Diesel bleeding
- Fuel suction device
- Fuel consumption meter



QR-code on the topic of  
fuel injection system



## Common Rail Systems

CRP 01.2

042134\_1



### Common rail high pressure testing device with analogue display

for testing high pressure pumps during engine-start. Operation range up to 1000 bar / 1400 psi.

High pressure gauge, stainless steel construction, NG 63, measurement range 0...1000 bar, glycerine-filled. The testing device has diverse applications due to the various CRPZ adapters (see scope of delivery).

#### Scope of delivery:

Code	Ref No.	Description
1 high pressure manometer		NG 63, 0...1000 bar, glycerine-filled
DETA	041257	adapter, thread M 14x1.5, IG - M 12x1.5 AG
1 adapter		G 1/4 - M 12x1.5
CRPZ 01	042114_1	adapter, thread M 14x1.5, AG - M 12x1.5, AG
CRPZ 02	042115_1	fuel fuel, rigid, 120 mm, bend 50°, M 12x1.5 - M 14x1.5
CRPZ 03	042116_1	fuel fuel, rigid, 120 mm, bend 90°, M 12x1.5 - M 14x1.5
CRPZ 04	042121_1	fuel fuel, rigid, 120 mm, bend 90°, angle length 40 mm
CRPZ 05	042122_1	fuel fuel, rigid, 120 mm, bend 90°+45°, M 12x1.5 - M 14x1.5
CRPZ 06	042123_1	fuel fuel, rigid, 120 mm, bend 65°, M 12x1.5 - M 14x1.5

#### Delivery in solid plastic case

CRP 04

042112\_1



### Pressure tester for static and dynamic high-pressure pump testing

Both the pump starting pressure and the pressure level at changing speeds can be tested.

- 1** pression tester unit CRP 04 with high pressure gauge with protective rubber cap, DS 100 mm (4"), 0...1600 bar
- 2** high pressure hoses, each 0.50 m long
- 1** adapter M 12x1.5 both sides (ET 446)

#### Delivery in solid plastic case

#### Accessory

Code	Ref No.	Description
DETA	041257	Adapter, thread M 14x1,5 (IG) + M 12x1,5 (AG)
CRPZ 01	042114_1	Adapter, thread M 14x1,5 (AG) + M 12x1,5 (AG)
CRPZ 02	042115_1	Fuel fuel, rigid, 120 mm, bended 50°, M 12x1,5 - M 14x1,5
CRPZ 03	042116_1	Fuel fuel, rigid, 120 mm, bended 90°, M 12x1,5 - M 14x1,5
CRPZ 04	042121_1	Fuel fuel, rigid, 120 mm, bended 90° angle length 40 mm
CRPZ 05	042122_1	Fuel fuel, rigid, 120 mm, bended 90°+45°, M 12x1,5 - M 14x1,5
CRPZ 06	042123_1	Fuel fuel, rigid, 120 mm, bended 65°, M 12x1,5 - M 14x1,5
CRPZ 07	042124_1	high pressure tap, M 14x1,5
CRPZ 08	042127_1	Fuel line 120 mm, bended 45°, M 12x1,5 both sides
CRPZ 09	042128_1	Fuel line 120 mm, bended 90°, M 12x1,5 both sides
CRPZ 10	042129_1	Fuel line 120 mm, bended 45°, M 14x1,5 both sides
CRPZ 11	042130_1	Fuel line 120 mm, bended 90°, M 14x1,5 both sides
CRPZ 16	042141_1	Adapter, thread M 14x1,5 (AG) both sides



CRP 02.1

042102\_2



## Digital pressure tester with plug-in adapters for the pressure and leak testing of common rail systems

The tester is directly connected to the high pressure rail sensor by means of the adapters supplied (see contents). The existing system pressure is shown on the display and can then be compared with the manufacturer's data. Two measuring ranges possible.

- range 0...1500 bar or 0...1800 bar
- measurement resolution 1 bar
- indication for defective pressure rail sensor
- fault detection indicated by a red warning LED
- automatic cut-off after 1 minute
- power supply by 9 V battery

**1 basic unit CRP 02**

**1 adapter cable CRPA 01 (042103) (Mercedes vehicles)**

**1 adapter cable CRPA 02 (042104) (universal connecting plug)**

**1 adapter cable CRPA 03 (042105) (French and Italian vehicles)**

**Delivery in solid plastic case**

CRP 2500

042131\_2



## Common rail high pressure tester

design as for CRP 04, pressure gauge in stainless steel with measurement range 0 to 2500 bar.

**1 test block with high-pressure gauge with GSK, NG 100, measurement range 0 to 2500 bar**

**2 flexible high-pressure hoses M 14x1.5, length 0.50 m**

**1 adapter thread M 14x1.5 (male thread)**

**1 silicone hose, 1.00 m (3.3 ft)**

**Delivery in solid plastic case**

CRPD 2500

042140\_1



## Common rail high pressure tester with digital manometer

design as for CRP 04, pressure gauge in stainless steel.

- Measurement range 0...2500 bar with digital manometer

**1 test block with digital pressure gauge with protective rubber cap, NG 100, measurement range 0...2500 bar**

**2 flexible high-pressure hoses M 14x1.5, length 0.50 m**

**1 adapter thread M 14x1.5 (male thread)**

**1 silicone hose, 1.00 m (3.3 ft)**

**Delivery in solid plastic case**

## Common Rail-Injector return flow measurement

A very clear performance indicator for Common Rail Injectors is the Diesel return-flow (spill rate). A defective injector has a significant higher or lower return-flow compared with a good injector.

CRMK 01

042119\_1



## Test kit for checking the return flow volumes from common rail systems for 6 injectors

Test kit for checking the return flow volumes from common rail systems for six injectors. Suitable for use with all BOSCH, DELPHI, DENSO and VDO/SIEMENS injectors.

# - 50 - Fuel Injection System

A plexiglass container with a graduated scale permits the comparative measurement of return flow volumes from individual injectors. The container is provided with a hook, so that it can be hung up in the engine compartment. The tester is connected by adapters to the return flow pipe from the injector. The adapters, marked with the name of the injector manufacturer, can be changed over at the connecting hosepipe.

- 1 plexiglass measuring container with 6 fuel-resistant, highly flexible hoses, each 0.40 m long (1ft)**
- 6 adapters for BOSCH injectors**
- 6 adapters for DELPHI injectors**
- 6 adapters for DENSO injectors**
- 6 adapters for VDO/SIEMENS injectors**

Delivery in solid plastic case

CRMK 02

042138\_2



## Test kit for checking the return flow volumes from common rail systems for 4 injectors

Test kit for checking the return flow volumes from common rail systems for four injectors. Suitable for use with all BOSCH, DELPHI, DENSO and VDO/SIEMENS injectors.

A plexiglass container with a graduated scale permits the comparative measurement of return flow volumes from individual injectors. The container is provided with a hook, so that it can be hung up in the engine compartment. The tester is connected by adapters to the return flow pipe from the injector. The adapters, marked with the name of the injector manufacturer, can be changed over at the connecting hosepipe.

- 1 plexiglass measuring container with 6 fuel-resistant, highly flexible hoses, each 0.40 m long (1ft)**
- 6 adapters for BOSCH injectors**
- 6 adapters for DELPHI injectors**
- 6 adapters for DENSO injectors**
- 6 adapters for VDO/SIEMENS injectors**

Delivery in solid plastic case

CRRMK 01

042405\_1



## Master kit, common rail return flow tester

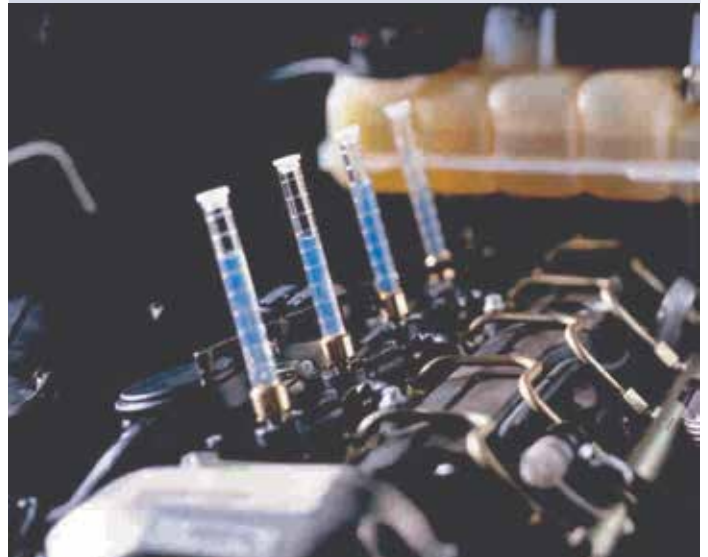
Master kit, common rail return flow tester with graduated plastic measuring beaker (120 ml) in an aluminium holder, including 1.00 m highly flexible, fuel resistant plastic tube.

Interchangeable connectors, useable for BOSCH, DELPHI, DENSO, VDO injectors.

- 1 plexiglass measuring container with**
- 1 highly flexible hose (Silikon) 1.00 m (3 ft)**
- 1 adapter for BOSCH (Piezo valve)**
- 1 adapter for BOSCH (solenoid valve)**
- 1 adapter for DELPHI (solenoid valve)**
- 1 adapter DENSO (solenoid valve)**
- 1 adapter VDO (Piezo valve)**

CRP 08

042106\_1



## Device for testing the return flow

A very clear performance indicator for Common Rail Injectors is the Diesel return-flow (spill rate). A defective injector has a significant higher or lower return-flow compared with a good injector.

- especially testing BOSCH injectors
- identifying a defective injector
- comparison of the back flow volume of each injector
- determine the total backflow

**8 of acrylic glass tubes, scaled, with brass connectors**  
Delivery in solid plastic case

## Common Rail injector, return flow pressure measurement

FP 05\_DELPHI

041224\_1



### Instrument for testing the return flow pressure from common rail injectors

Instrument for testing the return flow pressure from DELPHI Piezo common rail injectors. Suitable for testing the condition of a Piezo common rail injector (pass/fail statement). The instrument features a transparent body, permitting the identification of any air bubbles which may be present.

- suitable for DELPHI injectors
- compound gauge DS 63 (2 1/2") with double scale
- measuring range -1... +3 bar
- 0...760 mmHG / 0...215 psi

- 1 test unit with compound gauge**
- 2 connectable hoses Ø 4 mm, each 0.50 m long**
- 2 connectable hoses Ø 5 mm, each 0.50 m long**
- 1 conical brass adapter**

FP 06\_BOSCH

041225\_1



### Instrument for testing the return flow pressure from Piezo common rail injectors

Instrument for testing the return flow pressure from BOSCH Piezo common rail injectors. Suitable for testing the condition of a Piezo common rail injector (pass/fail statement).

The instrument features a transparent body, permitting the identification of any air bubbles which may be present.

- suitable for BOSCH injectors
- compound gauge DS 63 (2 1/2")
- measuring range -1... +15 bar

- 1 test unit with compound gauge**
- 1 release valve with PVC hose**
- 2 hoses each 0.30 m long with angle adapter**

FP 06U

041225\_3



### Tester for measuring the return pressure from piezo common rail injectors

Tester for measuring the return pressure from piezo common rail injectors. Suitable for testing the condition of a common rail injector (good/poor statement). The tester comes with a transparent body, permitting any air bubbles in the fluid to be seen.

The advantage of this tester is the possibility of changing testing hoses, thereby offering a choice of use with BOSCH or VDO/SIEMENS injectors (not supplied as standard but can be ordered separately - see FPZ xx).

- various uses
- compound gauge DS 63, range -1...+15 bar
- bleeding and pressure release feature

- 1 test unit with compound gauge**
- 1 release valve**
- 1 FPZ 02 hose set**
- 1 PVC hose 0.30 m long**

FPMK 01

042118\_1



## Test instrument for testing the return pressure from piezo common rail injectors

Test instrument for testing the return pressure from piezo common rail injectors. Suitable for testing the quality of a common rail injector (pass/fail statement). The tester features a test unit made of transparent Plexiglass permitting the identification of any air pockets which may be present. The advantage of the tester is that the vacuum gauge on the test unit can be exchanged.

The required pressure range for BOSCH and VDO/SIEMENS injectors is -1 to +15 bar, for DELPHI injectors it is -1 to +3 bar. The connecting leads FPZ 01, FPZ 02 and FPZ 03 can be connected to the control unit.

- suitable for use on a variety of injectors
- replaceable vacuum gauge
- release valve for venting/depressurisation

**1 test unit with gauge, quick-fit connectors and pressure release valve**  
**1 vacuum gauge DS 63, measuring range -1 to +15 bar**  
**1 vacuum gauge DS 63, measuring range -1 to +3 bar**  
**FPZ 01 set of hoses, for connection to VDO/SIEMENS injectors**  
**FPZ 02 set of hoses, for connection to BOSCH injectors**  
**FPZ 03 set of hoses, for connection to DELPHI injectors**  
**1 conical brass adapter**

Delivery in solid plastic case

## Accessory for Common Rail return flow tester

Code	Ref No.	Description
FPZ 01	041227_1	set of hoses with connectors, each hose 0.30 m long for VDO/SIEMENS injectors.
FPZ 02	041227_2	set of hoses with connectors, each hose 0.30 m long for BOSCH injectors
FPZ 03	041227_3	set of hoses with connectors, each hose 0.30 m long for DELPHI injectors.
FPZ 04	041227_4	set of hoses with connectors, each hose 0.30 m long for DELPHI solenoid



## Fuel identification

The smallest quantities of gasoline in a common rail system lead to the corrosion of engine parts, which later causes individual components to fail.

If a not suitably equipped Diesel engine is refuelled with a Diesel/bioDiesel mixture, there is a possibility that the engine will be damaged.

In the area of motor vehicle servicing, it is a great help to be able to identify fuel before extensive measurements are carried out on the system pressure and for leaks etc.

EMK 01

110805\_1



## Ethanol measurement kit

For detection and measurement of the ethanol concentration of a fuel probe.

**1 measurement flask**  
**1 measurement cylinder 500 ml**  
**1 measurement cylinder 100 ml**  
**1 cleaning brush**  
**10 pipets**  
**1 coloring liquid LT 02**

Delivery in solid plastic case

KIK 01\_LR

110804\_1



## Fuel identification kit

The smallest quantities of gasoline in a common rail system lead to the corrosion of engine parts, which later causes individual components to fail. The use of the BD 01 petrol detector guarantees the detection of contaminated fuel, from a percentage as small as 0.2 % gasoline in a Diesel system.

In the area of motor vehicle servicing, it is a great help to be able to identify fuel before extensive measurements are carried out on the system pressure and for leaks etc. Power is supplied by the 12VDC vehicle electrical system.

- 1 petrol detector 12 VDC**
- 1 measuring cylinder 500 ml**
- 1 hydrometer (for density determination)**
- 1 hook up clips NSVA 100**
- 1 cleaning brush**
- 50 pcs filter pads**

**Delivery in solid plastic case**

KIK 02\_LR

110803\_1



## Fuel Identification kit

Same function and delivery content as KIK 01\_LR but without hydrometer for density determination.

The smallest quantities of gasoline in a common rail system lead to the corrosion of engine parts, which later causes individual components to fail. The use of the BD 01 petrol detector guarantees the detection of contaminated fuel, from a percentage as small as 0.2 % gasoline in a Diesel system.

In the area of motor vehicle servicing, it is a great help to be able to identify

fuel before extensive measurements are carried out on the system pressure and for leaks etc. Power is supplied by the 12VDC vehicle electrical system.

- 1 petrol detector 12 VDC**
- 1 measuring cylinder 500 ml**
- 1 hook up clips NSVA 100**
- 1 cleaning brush**
- 50 pcs filter pads**

**Delivery in solid plastic case**

DMP 01

110801\_1



## Diesel mixture tester

If a not suitably equipped Diesel engine is refuelled with a Diesel/bioDiesel mixture, there is a possibility that the engine will be damaged. The DMP 01 Diesel mixture tester was developed to determine this mixture ratio.

- easy and reliable to use
- quick testing possible on sight
- wear-free testing

Tester for measuring the mixture ratio of bioDiesel and Diesel fuel based on the principle of density measurement. The instrument permits rapid, reliable testing by sampling fuel direct from the tank.

The test result is displayed on a coloured scale (see pic.).

DMP 02

110802\_1



## Fuel identification device

The use of the fuel identification device enables definition of the fuel type in events of possible damage to the fuel system.

- rapid measurement possible on-site
- in Diesel systems – Diesel or bioDiesel
- in otto/bifuel systems – petrol, E 85 or E 100 ethanol
- indication via measurement device with colour scale

By removing 500 ml of fuel from the fuel tank, a clear statement can be made about the fuel type used. Measurement results are based on an ambient temperature of 20 °C.

**Note:** The DMP 02 identification device does not give judicially useable measurement results.

## Delivery in solid plastic case



## Injection testers

DET/BET-type injection testers are available in steel or aluminum and can be supplied with or without a drag pointer, as required.

### pressure gauge range

DET testers:

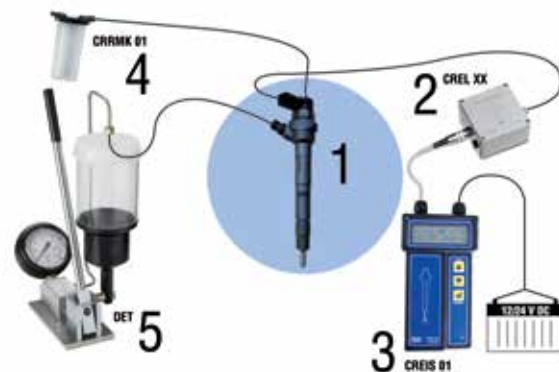
- 0...400 bar / 0...5800 psi
- 0...600 bar / 0...8700 psi

BET testers:

- 0...10 bar / 145 psi (see tables)

All the testers are fitted with a splashproof plexiglas container for the protection of the environment.

## Flow diagram



## Testing of Common Rail injectors

With injector testers

- (5) DET 062 and DET 063, measuring range 0...600 bar
- (3) the CREIS 01 electronic injector control system
- (2) and the CREL XX electronic power section (depending on the injector manufacturer)

Common Rail injectors can be function tested in removed condition for faults such as dribbling, pressure loss, etc. At the same time, the return flow volume can be measured with the CRRMK 01 Common Rail return flow tester. Can be used with the injectors of every manufacturer with the aid of replaceable adapters.

CREIS 01\_12

042401\_1



## Electronic injector control

The CREIS 01 electronic injector control unit serves to control all the CREL\_XXX units listed below (see flow diagram) - irrespective of the injector type and manufacturer.

The duration of the injection process can be chosen between 200  $\mu$ s and 1000  $\mu$ s in 50  $\mu$ s stages. It is also possible to choose between continuous and single injection modes.

- automatic recognition of minimum operating voltage
- the injection process can be broken off by means of the stop button
- visual indicator activated when a control signal is being sent
- power supply, 12 VDC

CREL

-



## Electronic power section for Common Rail injectors

Electronic power section for different Common Rail injectors based on the principle of the solenoid valve or piezo valve. The power section is fitted with an electrical connection to fit the injector. It generates suitable electrical signals specifically for this type of injector and in the form produced by the injector control unit in the vehicle. Control functions are performed by a CREIS 01\_12 (duration of the injection process, start, stop, control signal and fault display).

Different versions, depending on the injector manufacturer, are available:

Code	Ref No.	Type
CREL_BOSCH_M01	042402_1	solenoid valve
CREL_BOSCH_INDUSTRIAL_M01	042402_2	solenoid valve
CREL_DELPHI_M01	042403_1	solenoid valve
CREL_DENSO_M01	042404_1	solenoid valve
CREL_BOSCH_P01	042406_1	piezo valve
CREL_VDO_P01	042407_1	piezo valve

DET 06

-



## Tester for testing petrol and Diesel fuel injectors

Tester for testing petrol and Diesel fuel injectors for:

- nozzle opening pressure (N.O.P), spray pattern and leaks
- measuring ranges 0...400 (600)bar / 0...5800 (8700 psi)

Special design in aluminium with baseplate; precision pressure gauge made of V steel, DS 100, with protective rubber cap; splashproof liquid container (330 cm<sup>3</sup>) made of Plexiglas.

The advantage of this tester is that the pump lever can be transferred to the front socket to facilitate pumping (volume per stroke 35 cm<sup>3</sup>). The drag pointer of DET 061 and DET 063 type testers registers the injection pressure and stays in that position. As a result, it is not necessary to observe the injector spray pattern and the pressure gauge at the same time.

Available adapters for injection testers DET 06..

DETA (041257) standard adapter (M 14x1.5)

DETA 01 (041254) Opel, motortype DTL + DTH (M 17x0,75 with closed cone)

DETA 02 (041256) VW/Audi, motortype TDI (M 12x1.25)

**Note:** All makes of common rail injector can be tested for leaks (drips, loss of pressure, etc.) with the testers types DET 062 and DET 063 (test range 0...600 bar).

### 1 injection tester DET

1 pressure line thread M 12x1.5

1 adapter DETA thread M 14x1.5

Code	Ref No.	Range
DET 06	041255	0...400 bar / 0...5800 psi
DET 061	041255_1	0...400 bar / 0...5800 psi with drag pointer
DET 062	041255_2	0...600 bar / 0...8700 psi
DET 063	041255_3	0...600 bar / 0...8700 psi with drag pointer
BET 06	041255_4	0...10 bar / 0...145 psi

DET



## Tester for testing of petrol and Diesel fuel injectors

Workshop tester made of aluminium, for testing of:

- nozzle opening pressure (N.O.P.)
- spray pattern
- leaks
- measuring ranges 0...400 (600) bar / 0...5800 (8700) psi
- detachable pump lever

Precision pressure gauge made of V steel, DS 100, with protective rubber cap, splashproof plexiglas container for the protection of the environment. Doublescale bar/psi. Two connecting lines with threaded connectors M 12x1.5 and M 14x1.5, swept volume 25 cm<sup>3</sup>.

### Versions with drag pointer

Versions with \_SZ are fitted with an additional drag pointer, eliminating the need for the jet from the nozzle and the pressure gauge to be observed at the same time.

Available with an ISO certificate of calibration (at extra charge), further types see table below.

Code	Ref No.	Range
DET 400	041230_1	0...400 bar / 0...5800 psi
DET 400_SZ	041230_2	0...400 bar / 0...5800 psi with drag pointer
DET 600	041231_1	0...600 bar / 0...8700 psi
DET 600_SZ	041231_2	0...600 bar / 0...8700 psi with drag pointer
DET 1000	041258_1	0...1600 bar / 0...23200 psi

## Equipment for all Diesel injection control units

DETAVV

041259\_1



### Shut off and control unit

The shut off and control unit DETAVV will be installed between the testing device and the pressure gauge. The integrated shut off valve isolates the pressure gauge. The opening pressure of the valve can be regulated through a volume controller.

The shut off valve can also be ordered separately.

DETAV

041259\_2



### Shut off valve

The shut off valve will be installed between the testing device and the pressure gauge. It isolates the pressure gauge.

A volume controller can also be ordered separately.

CRE 04

042125\_1



### Plastic containers for determining the injection volume of common rail injectors

Four plastic containers, with graduated scales, for determining the injection volume of common rail injectors in removed condition. For the function test during the startup process, the injectors are connected electrically to the control unit and hydraulically to the rail.

### Test capabilities:

- determining injection volume
- determining damaged or leaking injectors (drips, etc.)
- determining closed injectors (no injection)
- determining open injectors (loss of hydraulic pressure)

**4 plastic containers (120 ml content)**





## Fuel pressure and leakage testers

You can find the list of the available adapters at our website at Service, Downloads, in "Adapter list for injection systems tester (DPAK)".

For this purpose you also can scan the QR-code.



**LR 180/2, LR 180/2\_21**

**041605, 041622\_1**



### System-pressure tester for mechanical and electronic fuel injection systems

High quality, for professional use. System-pressure tester for mechanical and electronic fuel injection systems.

The tester can be used for the following systems:  
K-Jetronic, KE-Jetronic, L/LH-Jetronic, Motronic, MPI, HMPI, EFI, DIGIFANT, Mono-Jetronic, Opel-Multec, Weber CFI

– measuring range 0...10 bar / 0...140 psi, graduation 0.1 bar

An adjustable three-way valve located between the warm-up regulator and fuel distributor permits the system pressure and control pressure to be tested, and the fuel injection system to be checked for leakages.

High quality gauge with robust protective rubber cap and hook, DS 100 mm (4"). With 12 adapters for the connection with European and Asian vehicles. Available with an ISO certificate of calibration (at extra charge).

**LR 180/2:**

- 1 pressure gauge**
- 1 three-way valve, connectable**
- 3 hoses each end with quick coupling, each 0.25 m long**
- 12 adapters DPAK 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 21**

**Delivery in solid plastic case**

**LR 180/2\_21:**

- same as LR 180/2 additional 9 adapters DPAK 1, 2, 22, 26, 28, 29, 30, 31, 32**

**Delivery in solid plastic case**

**LR 180/4**

**041615**



### System pressure tester for mechanical and electronic fuel injection systems

Extended version of LR 180/2 with 30 adapters. Thanks to this wide range of adapters, use is assured with almost all makes of car. The supplied unit contains 1 drain valve for the discharge of residual fuel.

– Available with an ISO certificate of calibration (at extra charge).

- 1 pressure gauge**
- 1 three-way valve, connectable**
- 3 hoses each end with quick coupling, each 0.25 m long**
- 30 adapters DPAK 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 19, 21, 22, 24, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39**
- 1 extensions hose 1.00 m long (3 ft)**
- 1 drain valve**

**Delivery in solid plastic case**

**ET 366, accessories**

**121382**

### Extension hose

Accessory for fuel system pressure testers LR 180.

- Extension hose
- length 3.00 m (9.8 ft.)
- fuel resistant
- with quick coupling on both sides



Used to check fuel pressure while driving.

LR 180/2\_Honda

041619



## System pressure tester

### for mechanical and electronic fuel injection systems

System pressure tester for mechanical and electronic fuel injection systems.

– Version in accordance with HONDA requirements

- 1 gauge DS 100, range 0...10 bar / 0...140 psi, with protective rubber cap and hook**
  - 1 three-way valve (connectable)**
  - 3 hoses, each end with quick coupling 0.25 m (9.8 in.)**
  - 3 adapters DPAK 52, 53, 61 (with push in fitting)**
  - 1 adapter ANK 47 (with thread)**
  - 1 drain valve AVE 01 with hose**
- Delivery in solid plastic case**

LR 180/01

041601\_1



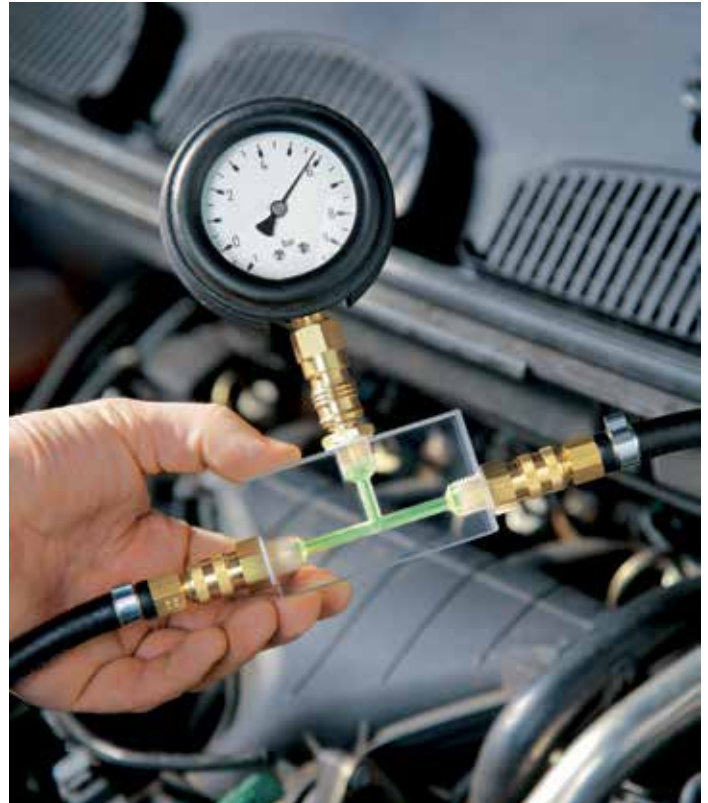
## System pressure tester for Schrader-valves

Fuel system pressure tester with compound gauge (vacuum/pressure). Suitable to check pressure of feed line on petrol engines.

- easy to use
- compound gauge
- range - 1...+9 bar

- 1 compound gauge**
- 1 connection hose with 2 x quick coupling DN5**
- 1 Schrader valve without return line M 8x1 (I) with release pin**
- 1 Schrader valve 7/16"- 20UNF V6**
- 1 Screw-on valve angled VG 8 (I,W) with release pin**
- 1 Screw-on valve straight VG 8 (I) with release pin**
- 1 Screw-on valve with hose 7/16"-20UNF (I)**

**Delivery in solid plastic case**



## System pressure test on low pressure side (inlet Common Rail high pressure pump)

LR 180\_AK2

041620\_2



## Fuel system pressure tester with compound gauge

Fuel system pressure tester with compound gauge (vacuum/pressure). Suitable to check pressure of fuel line and back flow on gasoline and Diesel engines. The transparent body allows to visibly check the fuel flow for air bubbles. The included adapters are suitable for fuel lines with quick connections according to SAE norm.

- easy to use
- compound gauge, range - 1...+9 bar

- 1 compound gauge**
- 7 adapters DPAK 64G, 65G, 66G, 67G, 68G, 69G, 70G;**

**Delivery in solid plastic case**

LRD 180\_AK2

041620\_8



## Fuel system pressure tester with digital gauge

Suitable to check pressure of fuel line and back flow on gasoline and Diesel engines. The transparent body allows to visibly check the fuel flow for air bubbles. The included adapters are suitable for fuel lines with quick connections according to SAE norm.

- easy to use
- Digital gauge, Ø 100
- Measurement range -1...+16 mbar

- 1 Digitale gaug (measurement range -1...+16 bar)**
- 1 Transparent body with quick coupling**
- 7 Adapters, DPAK 64G, 65G, 66G, 67G, 68G, 69G, 70G**

FP 04\_DELPHI

041214\_2



## Tester for measuring the ingoing pressure to a DELPHI high-pressure pump

Tester for measuring the ingoing pressure to a DELPHI high-pressure pump. Thanks to the length of the testing hose, pressure measurements can be taken during a trial run.

- vacuum gauge DS 63 mm (2 1/2"), range - 1...+5 bar
- plug-in connectors at both ends
- measurement under driving conditions possible

- 1 compound gauge**
- 1 test hose with T-piece, length 2.00 m (6 ft)**
- 2 test hoses, each 0.20 m long**

## Fuel supply pump testers

FP 01

041213



## Fuel supply pump tester

Fuel supply pump tester to control the fuel pump. There are many possibilities of testing:

- malfunction of fuel supply
- malfunction of overflow valve
- malfunction of feed pump
- leaking oil/fuel leads
- bubbles within the system
- measurement under driving conditions possible

- 1 high quality compound gauge with solid protective rubber cap DS 63 mm (2 1/2"), range -1...+3 bar**

**2 hoses 3.00 m (10 ft) long**

**1 adapter M 12x1.5 (female thread) connectable**

**1 adapter M 12x1.5 (male thread) connectable**

Delivery in paper box

FP 03

041213\_1



## Fuel supply pump tester

Fuel supply pump tester, equivalent version of FP 01, but

- range -1...+9 bar
- measurement under driving conditions possible

## Test stands Injection service solutions

Unique, compact, economic and professional solutions for every workshop, development and quality department, to test and service Diesel injection systems.

Common Rail revolutionary testing solutions for Bosch, Delphi, Denso, Conti/VDO and more.

Tests performed	
<b>R2LC</b>	Electrical test of $\Omega$ , F, H
<b>CFL</b>	Check for leaks test
<b>LKT</b>	Static back leak test
<b>aNOP</b>	Automatic nozzle opening pressure test
<b>iVM (FL, PL, EM, LL, PI)</b>	Injector volume measuring test, 15-steps (full-load, part-load, emissions, low-load, pre/post-injection tests)
<b>iVM-MTS</b>	Injector volume measuring test (multiple test-points slope)
<b>RSP</b>	Injector response time test
<b>SPR</b>	Dynamic spray test performed in all testing conditions

### Features

#### PIST

Pressurized, illuminated spray tube<sup>3)</sup> for clear view of injected pattern up to 2500 bar. You can virtually see the multiple injections as happening in the cylinder. Diagnosis of: NOP, incorrect spraying, leaky or seized injectors. The system integrates an easy and adjustable injector clamp.

#### Reports

Easy fail-track color report for each injector. Quick view or expert view reporting available.

#### RSP

RSP adapter<sup>1)</sup> is connected to the nozzle of each injector to precisely measure the actual mechanical response time of injection from the electrical actuation signal. Diagnosis of: slow acting injector, retarded injection event, poor performance and emissions.

#### Software

The revolutionary GUI that gives you the technological advancements of today. Wifi printing & sharing, server sync, auto-update of software and database, wireless access, USB and much more<sup>2)</sup>.

#### Injector coding function

- Bosch IMA coding capable,
- Delphi C2i, C3i coding capable,
- Denso QR-coding capable

#### Features

- all makes OE manufacturer database<sup>2)</sup>
- user programmable database
- HP up to 2500 bar<sup>1)</sup> with only 6.5 bar supply air
- Piezo & solenoid actuation (HV: 0-250 Volts / 0-35 A)
- programmable piezo profiles
- injector & PCB protection circuit
- up to 18 multiple Injections capable

- Piezo return regulators<sup>1)</sup>
- ergonomic, dynamic & robust design
- complete set of CRI adapters, fittings and connectors for all makes & types
- user-friendly units
- reports can be saved on the bench and/or USB-stick, directly printed or sent by mail via Wifi

#### Injector cleaning (aMACC<sup>1)</sup>)

- automatic chemical treatment and flushing of the injector before testing

#### Dynamic, electronic mass flow measurement (iVM)

Accurate, repeatable and fast electronic measurement of discharged and returned volumes. The only metering device available in the market today, that has no moving parts, does not require filtering and temperature calibration. Shot-to-Shot and Multiple-Injection-Metering capability.

- dynamically measuring in mg/ stroke (equivalent to mm<sup>3</sup>/stroke)
- repeatability: 0.05 %
- accuracy: 0.2 %

#### Static, electronic mass measurement (iVM)

Accurate and repeatable electronic measurement of discharged and returned volumes. Has no moving parts, does not require filtering or temperature calibration.

- statically measuring in mg/stroke (equivalent to mm<sup>3</sup>/stroke)
- resolution 0.1 mm<sup>3</sup>
- accuracy 0.6 %



## DISU 4000



### Test & Service bench for 4 Diesel CR-Injector - High End Model

- full-automatic operation
- HP up to 2500 bar
- injector coding capable<sup>2)</sup>
- dynamic, electronic mass flow measurement
- 10" touchscreen HMI

## DISU 6000



### Test bench for Diesel CR-Injectors - High End Model

- full-automatic operation
- HP up to 2500 bar
- injector coding capable<sup>2)</sup>
- dynamic, electronic mass flow measurement
- under 8 min testing phase
- 10" touchscreen HMI

## GISU 4000



### Test bench for 4 Gasoline Direct Injectors

- full-automatic operation
- HP up to 550 bar
- dynamic electronic mass flow measurement
- under 17 min testing phase (4 injectors)
- 10" touchscreen HMI

## GISU 6000



### Test & service bench for 1 Gasoline Direct Injector<sup>1)</sup>

- full-automatic operation
- HP up to 550 bar
- dynamic electronic mass flow measurement
- under 5 min testing phase
- 10" touchscreen HMI

1) Optional

2) Continuously updated function to more makes and systems

3) Only 1 item is integrated per unit. Extra items are optional

# - 62 - Fuel Injection System

## DISU 1200



### Test bench for Diesel CR-Injectors - Starting Model

- Full-automatic operation
- HP up to 2000 bar
- Static electronic mass measurement
- 12 min testing phase
- 8" touchscreen HMI
- Documentaion of measurement results

## GISU 1200



### Test & service bench for 1 Gasoline Direct Injector - Starting Model

- Full-automatic operation
- HP up to 300 bar
- static electronic mass flow measurement
- 7 min testing phase
- 8" touchscreen HMI
- Documentation of all measurement results

- 1) Optional
- 2) Continuously updated function to more makes and systems
- 3) Only 1 item is integrated per unit. Extra items are optional

## Common Rail Injector Service Unit

Code	Testpressure max.(bar <sup>9</sup> )	Cleaning (aMACC)	Injectors	
DISU 4000_2000 bar	2000	-	4	
DISU 4000_2500 bar	2500	-	4	
DISU 6000_2000 bar_T	2000	-	1	
DISU 6000_2000 bar_C	2000	✓	1	
DISU 6000_2500 bar_T	2500	-	1	
DISU 6000_2500 bar_C	2500	✓	1	
DISU 1200_2000 bar	2000	-	1	

## Gasoline Direct Injector Service Unit

Code	Testpressure max.[bar]	Cleaning (aMACC)	Injectors	
GISU 4000_300 bar_T	300	-	4	
GISU 4000_300 bar_C	300	✓	4	
GISU 4000_550 bar_T	550	-	4	
GISU 4000_550 bar_C	550	✓	4	
GISU 6000_300 bar_T	300	-	1	
GISU 6000_300 bar_C	300	✓	1	
GISU 6000_550 bar_T	550	-	1	
GISU 6000_550 bar_C	550	✓	1	
GISU 1200_300 bar	300	-	1	

## DISU

	Test Time ca. (min)	Measuring system	Accuracy
	25	Dynamic electronic mass flow measurement	0,20 %
	25	Dynamic electronic mass flow measurement	0,20 %
	8	Dynamic electronic mass flow measurement	0,20 %
	8	Dynamic electronic mass flow measurement	0,20 %
	8	Dynamic electronic mass flow measurement	0,20 %
	8	Dynamic electronic mass flow measurement	0,20 %
	12	Static electronic mass measurement	0,60 %

## GISU

	Test Time ca. min	Measuring system	Accuracy
	17	Dynamic electronic mass flow measurement	0,20 %
	17	Dynamic electronic mass flow measurement	0,20 %
	17	Dynamic electronic mass flow measurement	0,20 %
	17	Dynamic electronic mass flow measurement	0,20 %
	5	Dynamic electronic mass flow measurement	0,20 %
	5	Dynamic electronic mass flow measurement	0,20 %
	5	Dynamic electronic mass flow measurement	0,20 %
	5	Dynamic electronic mass flow measurement	0,20 %
	7	Analog volumetric measurement	0,60 %

## Accessories for DISU and GISU test benches

### Adapter Sets



A wide range of Adapters<sup>1)</sup> for commercial vehicles, trucks, buses and industrial engines is available.

### DISU\_Z\_RSP<sup>1)</sup>

### GISU\_Z\_RSP<sup>1)</sup>

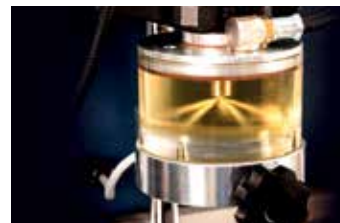


#### Nozzle response time sensor

- For all makes
- For 7...9 mm nozzle
- Pressure ca. 2 bar
- Measurement range 50...4000 µs

### DISU\_Z\_PIST<sup>3)</sup>

### GISU\_Z\_PIST<sup>3)</sup>



#### Pressurized illuminated spray tube

### Overview

Code	Description	Ref No.
DISU_Z01	Test fluid for DISU devices, content 4 l	041285_1
DISU_Z02	Treatment detergent for DISU devices (aMACC), content 2 l	041292_1
GISU_Z01	Test fluid for GISU devices, content 4 l	041286_1
GISU_Z02	Treatment detergent for GISU devices (aMACC), content 2 l	041296_1
Adapter sets	A wide variety of adapters for utility vehicles, trucks, busses, industrial engines is available	on request
DISU_Z_RSP	nozzle response time sensor for all makes, for 7...9 mm nozles, pressure ca. 2 bar, measurement range 50...4000 µs	041284_1
GISU_Z_RSP		041297_1
DISU_Z_PIST	pressurized illuminated spray tube	041293_1
GISU_Z_PIST		041314_1

USB 01\_EU

130603\_1



## Ultrasonic bath

For cleaning of injectors, injector parts and small mechanical parts.

### Suitable for:

- cleaning of complete injectors
- cleaning of injector parts
- cleaning of small mechanical parts
- with timer

### Technical data:

- operating voltage: 230 VAC
- frequency: 44 kHz
- heatable basin: 30 °C to 80 °C
- weight: 3.8 kg

Code	Description	Ref No.
USB_Z1	Holding for Gasoline DI-Injectors for USB 01_EU	130611_1
USB_Z2	Holding for Diesel CR-Injectors for USB 01_EU	130612_1
USB_Z3	Cage and lid for USB 01_EU	130613_1
USB_Z4	Cage for USB 01_EU	130614_1
USB_Z5	Lid for USB 01_EU	130615_1
USB_Z6	Cleaning concentrate for USB 01_EU, content 1 l	130616_1
USB_Z7	V2A-Holding with space for 6 each Gasoline DI and Diesel CR-Injectors (for USB 01_EU)	130618_1

MP\_CR 01

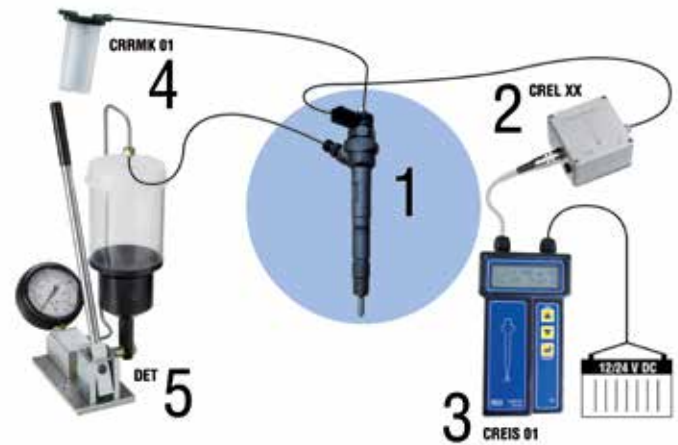
042416\_1



## Mini-test bench for CR-injectors

All components are mounted stationary on the stable plate. Function and composition, see flow diagram below.

Flow diagram mini test bench



## Testing Common Rail Injectors

With injector testers types **DET 062** and **DET 063 (5)**, measuring range 0-600 bar, the **CREIS 01 (3)** electronic injector control system and the **CREL XX (2)** electronic power section (depending on the injector manufacturer), Common Rail injectors can be function tested in removed condition for faults such as dribbling, pressure loss, etc. At the same time, the return flow volume can be measured with the **CRRMK 01 (4)** Common Rail return flow tester; can be used with the injectors of every manufacturer with the aid of replaceable adapters.

- 1 Common Rail Injector (test piece)
- 2 CREL\_BOSCH\_M01, solenoid valve (example)
- 3 CREIS 01 electronic injector control system 12 V/DV
- 4 CRRMK 01 Common Rail return flow tester
- 5 Injector testers types DET 062, DET 063 mechanical, MB 0-600 bar

## Diesel bleeding

DEG 01\_24VDC

060504\_2



## Electrical pump for ventilation of fuel systems of HDEP/MDEG Diesel motors in utility vehicles

- ventilation process can be precisely observed
- suction hose with integral fuel filter
- pressure gauge with a measurement range of 0...10 bar, glycerine-filled
- automatic device switch-off at maximum pressure of 6.9 bar
- 24 VDC power supply via battery terminals
- light metal housing with carrying handle



- 1 electr. pump
- 1 suction hose, length 3.00 m, with fuel filter
- 2 spare filters including clamps
- 1 pressure hose, length 2.50 m (8.2 ft), with quick-connect coupling
- 1 electr. connection cable with battery terminals
- 1 lead for power supply from battery

## Fuel suction device

**BAS 01**

**060306**



### Fuel extractor unit 12 V

Explosion-proof fuel extractor unit, suitable for fuel tank repairs, by the used car trade and in any situation where fuel must be drawn off (tank emptying). Automatic cutout is assured when used with pressure sealed fuel container BAS 013 (see accessories). The unit is protected by an overload fuse.

- can be used anywhere
- suitable for all types of fuel
- power supply 12 VDC by battery clamps
- extraction rate 90 l/h
- refillable
- robust instrument in metal housing

### 1 fuel suction device BAS 01

1 electr. connecting lead 5.00 m (14 ft)

1 fuel filter

2 fuel hoses 2.50 m and 1.50 m long

### Spare parts BAS 01, BAS 02, BAS02.1

Code	Ref No.	Description
ET 205	121105	fuel filter for BAS 01/02
ET 208	121107	fuse for BAS 01 (1.6 A)
ET 209	121108	fuse for BAS 02, BAS 02.1 (3.15 A)
ET 220	121117	connecting hose (input) for BAS 01/02, (2.50 m) with filter
ET 221	121118	hose (output) for BAS 01/02 (1.50 m)
ET 454	121484	clamp black
ET 455	121485	clamp red

**BAS 02**

**060310**



### Fuel extractor unit 12 V

Equivalent version of BAS 01, but suction capacity 180 l/h.

**KEG 01**

**060337\_1**



### Fuel bleeding device, operated by compressed air

This fuel bleeding device is a robust, explosion-proof device for pumping liquid fuels and for bleeding fuel systems and fuel circuits. The device can be used at repair shops, fuel filling stations and scrap yards to handle ethanol, Diesel and kerosene fuels. A compressed air supply of at least 4 bar is required.

The fuel bleeding device has a specially designed pump with a high delivery rate and a low compressed air consumption. The robust metal housing protects the pump against dirt and impacts. The carrying handle allows simple transportation of the device.

### Suitable for types of fuels:

- ethanol, Diesel, kerosene
- delivery rate: 9 l/min
- suction pressure: < 600 mbar abs.
- compressed air supply: min. 4 bar

## Accessories for BAS 01/02

FTW 03

130305



### Rolling carriage

Rolling carriage metal version, adjustable for BAS 013.

Delivery in paper box

BAS 015

060315



### Adapter for the leading back of petrol/air vapors

Adapter for the leading back of petrol/air vapors

Delivery in paper box

BAS 013

060312



### Fuel tank metal version with fuel level gauge, suitable with petrol and Diesel fluid

Fuel tank metal version with fuel level gauge, suitable with petrol and Diesel fluid. A riser pipe permits the emptying of the container or refilling of the extracted fuel.

A1 certification (suitable for interim storage only).

capacity 120 litres

Delivery in paper box

## Fuel tank and fuel tank cap testing

TVP 01

012201\_1



### Tank cap tester with quick-release coupling and drainage valve

Using a vehicle-specific TV-adaptor and with the aid of manual pump TVU 139/1 with pressure gauge measurement 0...2.5 bar / 0...36 psi, pressure is generated to allow the following tests to be performed at the tank cap.

- valve function
- seal tightness of the tank cap

TSD\_03\_LR

012103\_5



### Leakage test of the fuel tank system

TSD 03\_LR is suitable to test the tightness of fuelsystems especially after the fuel system was open for diagnosis or repair processes. The access to the fuel system is via fuel tank opening or a close quick connector.

- test pressure 20 mbar
- operated with workshop pressure
- test adapters are not included

TSDD\_03\_LR

012104\_1



### Leakage test of the fuel tank system with digital pressure gauge

TSD 05\_LR is suitable to test the tightness of fuelsystems especially after the fuel system was open after diagnosis or repair processes. The access to the fuel system is via fuel tank opening or a close quick connector.

- test pressure 20 mbar
- operated with workshop pressure
- measurement range -50...+50 mbar
- test adapters are not included

FJW 01

012305\_1



### Installation tool for fuel filter lids

For the installation of fuel filter lids. To avoid leakages after the fuel filter was replaced. Suitable for all vehicles fitted with a threaded UFI fuel filter housing. For all Diesel engines with screwed UFI fuel filter cases

## Fuel consumption meter

FCM 01\_Set\_LR01

041820\_1



### Fuel consumption meter

**Measures your vehicle's exact consumption during a road test under real driving conditions.**

For gasoline and Diesel systems with or without return line. Calibrated flow sensors guarantee a high level of accuracy.

#### Indicates:

- current consumption in km/l
- current temperature in °C
- consumption liters per hour
- volume in l
- easy handling by intuitive keypad
- USB port for data transfer at USB stick

#### Applications:

- fuel consumption
- flow rate for fuel systems with return or returnless fuel systems
- volume measurement of other fluids possible

#### Use:

- in test rigs
- in facilities
- mobile use
- calibration medias:
- Diesel- or petrol fuel
- other fluids on request

#### Spezification:

- temperature range: +20...+100° C
- pressure range (flow sensor): -1...+16 bar
- suitable media: petrol, diesel and others on request
- power supply 10...28 VDC
- pressure range flow sensors typ 1: 15...500 l/h
- pressure range flow sensors typ 2: 4...100 l/h

**1 Measuring unit FCM 01 incl. powerlead, length 3m**

**2 Flow sensors type 1 (for fuel system with return line)**

**1 Flow sensors type 2 (for fuel system without return line)**

**3 Temperature sensors incl. hydraulic distributor**



# QUALITY MADE IN GERMANY

The quality management system  
of the **LEITENBERGER**-group  
is certified according to:

ISO 9001 : 2015,  
Registration no. 12 100 24343 TMS



## CERTIFICATE

The Certification Body  
of TÜV SÜD Management Service GmbH  
certifies that



**Autotestgeräte LEITENBERGER GmbH**  
Bahnhofstraße 32/33  
72138 Kirchentellinsfurt  
Germany

has established and applies  
a Quality Management System for

**development, manufacturing and sales of  
test equipment for cars.**

An audit was performed. Report No. 70005540.  
Proof has been furnished that the requirements  
according to

**ISO 9001:2015**

are fulfilled.

The certificate is valid in conjunction  
with the main certificate from 2017-02-09 until 2020-02-07.  
Certificate Registration No.: 12 100 24343/03 TMS.

*Dr. Hege*  
Product Compliance Management  
March, 2017-02-09



## Adapters for brake system

There is a large variety of adapters for brake testers available. For almost every brand.

You can find the list of the available adapters at our website at Service, Downloads, in "Adapter list for brake tester".

For this purpose you also can scan the QR-code.

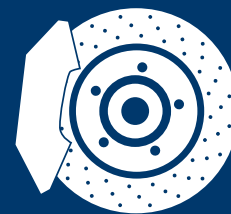
QR-Code to  
Adapter list for brake tester



## Brake fluid tester

- Brake fluid tester and quality control
- Brake pressure test device for passenger cars and transport vehicles
- Digital brake pressure test device
- Vacuum brake bleeders
- Brake bleeder service unit - maintenance, tightness test, sucking, filling
- Adapter sets
- Brake line bending tool

### BRAKE SYSTEM



QR-code on the topic of  
brake system



## Brake fluid tester

The condition of the brake fluid in vehicles is an important factor for road safety. The effects of the hygroscopic nature of brake fluid are increased viscosity (delayed braking action), a lower boiling point and severe corrosion in the braking system. The timely replacement of used brake fluid ensures the road safety of the vehicle and the effective service life of the braking system.

The LEITENBERGER range comprises brake fluid testers capable of performing two measurement methods.

### 1. Measurements of the conductivity of the brake fluid

- EBT 01 (DOT 4)
- EBT 03 (DOT 3, DOT 4, DOT 4 Plus, DOT 5.1)
- EBT 06 (DOT 3, DOT 4 and DOT 5.1)

#### Note:

Mineral and silicon-based brake fluids cannot be tested with EBT 01, EBT 03 or EBT 06.

### 2. Measurement of the refractive index

- BC 03 (DOT 3)
- BC 04 (DOT 4, DOT 4 Plus)

EBT 01

100124



### Electronic brake fluid tester with membrane keypad for DOT 4 brake fluid

Results are indicated by 3 LEDs representing the percentage of water content in the brake fluid.

#### Indication:

- |                          |                                  |
|--------------------------|----------------------------------|
| GREEN 0...1%             | = brake fluid is o.k.            |
| GREEN + YELLOW appr. 2%  | = change brake fluid soon        |
| GREEN, YELLOW + RED > 3% | = change brake fluid immediately |

- robust stainless steel test probe
- automatic cutout
- low battery warning
- power supply by 9 V monobloc battery

Delivery in solid plastic case

EBT 03

100128



### Electronic brake fluid tester for various types of brake fluid as DOT 3, DOT 4, DOT 4 Plus, DOT 5.1

Electronic brake fluid tester for various types of brake fluid as DOT 3, DOT 4, DOT 4 Plus, DOT 5.1. The instrument is menu assisted and displays the test results in form of the boiling temperature (in °C) and water content (in %).

- processor controlled
- two-line, alphanumeric display
- testing starts automatically when sensor immersed
- low battery display
- tester switches off automatically after two minutes of inactivity
- robust stainless steel test probe
- power supply by 9 V monobloc battery

Delivery in solid plastic case

EBT 03\_USB

100127\_1



### Electronic brake fluid tester with USB interface

The unit is menu-driven and shows the measurement result of boiling temperature (in °C) and water content (in %).

- for brake fluids: DOT 3, DOT 4, DOT 4 Plus und DOT 5.1



- processor controlled
- digital documentation of measurement and customer data
- with two-line, alphanumeric display
- auto measurement starts on immersion of the sensor
- low bat. indication
- auto off after 2 min. without measurement
- robust sensor, made of stainless steel

**1 EBT 03\_USB**

**1 USB cable**

**1 software CD**

**2 manuals (for device and software installation)**

**Delivery in solid plastic case**

**EBT 06**

**100134**



## Electronic brake fluid tester with membrane keypad for brake fluids DOT 3, DOT 4 and DOT 5.1

The EBT 06 shows the boiling temperature in 10 °C-steps from 150 °C to 240 °C.

### Indication:

- GREEN LEDs = brake fluid is o.k.
- YELLOW LEDs = change brake fluid soon
- RED LEDs = change brake fluid immediately

- robust stainless steel test probe
- automatic cutout
- low battery display
- LED for defective sensor
- power supply by 9 V monobloc battery

**Delivery in solid plastic case**

## Brake pressure testers for transport / utility vehicles

**BDP 01G**

**100102\_2**



### Brake pressure tester for pneumatic braking systems on transport vehicles, 25 bar

Brake pressure tester for pneumatic braking systems on transport vehicles. Connecting heads are supplied for connection to the braking system. All pressure gauges with protective rubber cap.

- suitable for safety test
- calibrated pressure gauges

**2 pressure gauges DS 100, 0...16 bar, class 1.0**

**1 pressure gauge DS 100, 0...25 bar, class 1.0**

**3 compressed air hoses, each 3.50 m (11.5 ft) long**

**4 connecting heads**

**Delivery in solid plastic case**

**BDP 02G**

**100103\_1**



### Brake pressure tester for pneumatic braking systems on transport vehicles

Brake pressure tester for pneumatic braking systems on transport vehicles. Connecting heads are supplied for connection to the braking system. All pressure gauges with protective rubber cap.

- suitable for safety test
- calibrated pressure gauges

**2 pressure gauges DS 100, 0...16 bar, class 1.0**

**2 compressed air hoses, 15.00 m (49 ft) long**

**2 connecting heads**

**Delivery in solid plastic case**

## Brake pressure tester passenger cars

BDP 04G, BDP 06G, BDP 08G 100105\_1, 100107\_1, 100119\_1



### Testers for hydraulic braking systems with high-capacity pressure gauge and high pressure lines

Testers with high-capacity pressure gauge and high pressure lines for hydraulic braking systems. Suitable for dual-circuit braking systems. Connection by means of brass adapter with metric thread. Testing can take place from the driver's seat.

- suitable for safety test
- calibrated pressure gauge/vacuum meter

#### BDP 04G:

2 pressure gauges DS 100, 0...160 bar, class 1.0  
 1 high pressure line 2 m long  
 1 high pressure line 5 m long  
 7 standard adapters BDA 01...07, M6, M7, M8, M 10x1, M 10x1.25, M 12x1, M 12x1.5 (2 of each)

#### BDP 06G same scope of delivery as BDP 04G plus:

1 vacuum meter DS 100 -1...0 bar  
 1 high pressure line 2 m long  
 2 x PVC hoses each 0.30 m

#### BDP 08G same scope of delivery as BDP 04G plus:

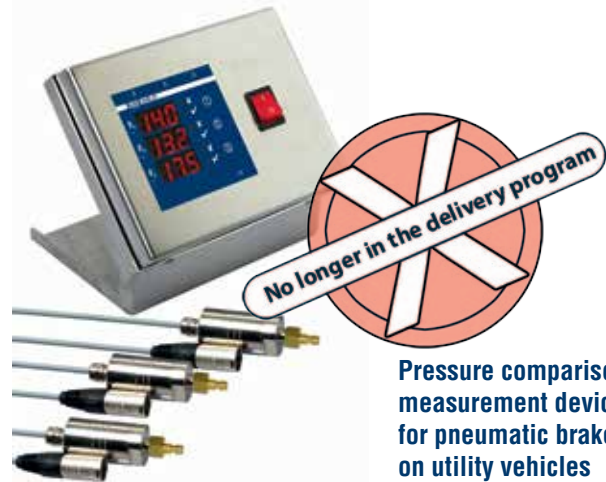
1 high capacity DS 100 pressure gauge, 0...250 bar  
 1 high pressure line 3 m long for brake servo-unit also permits testing of brake servo-units

Delivery in solid plastic case

## Brake pressure tester digital

BDPD 01

100101\_1



Pressure measurement and indication of 3 measurement points. For measuring and displaying of 3 pressures at the same time. These 3 measurements are numbered and listed at the same time.

- power supply: 12...24 VDC
- operation range: +10°...+50 °C
- 3 sensors: 0...25 bar, 0.5 % FS

Very good reading off the measurement results because of large lighted numbers also in bad light conditions.

#### 1 BDPD 01

3 Pressure sensors (with quick connectors)

Delivery in solid plastic case

BDPD 02

100100\_1



### Digital brake pressure tester

The digital pressure test device with 2 pressure sensors allows the determination of 2 pressure valves. Smooth change-over from analogue to digital measurement.

- 2 pressure sensors, 0...25 bar
- with differential pressure indication

#### 1 testdevice BDPD 02

2 pressure sensors 0...25 bar, 0.5 % FS

Delivery in solid plastic case

## Vacuum brake bleeders

**VB 01**

**100801\_1**



### Vacuum brake bleeder

Not suitable for inflammable fluids!  
Vacuum use only!

Portable vacuum box, made of impact resistant, unbreakable ABS, for the automatic extraction of fluids such as water, refrigerant, oil (engine, compressor, gearbox oil), coolant, brake fluid as well as bleeding of the fuel line on Diesel engines.

- connection for workshop compressed air system
- 11 litres capacity
- with drain valve

A vacuum is generated in the box by means of a venturi tube, connected to the workshop compressed air system. Extraction takes place by the removal of the venturi tube, connection of the extraction hose and opening of the valve. Extracting capacity, approx. 7 litres at - 0.7 bar. A drain valve at the rear of the box permits the extracted fluid to be emptied.

- 1 VB 01 vacuum box**
  - 1 venturi tube**
  - 1 extraction hose with connector, 2.50 m (8.2 ft)**
  - 1 rubber angled adapter (UNW 01)**
- Delivery in paper box

**VB 01.1**

**100801\_2**



### Vacuum brake bleeder with level indicator

Not suitable for inflammable fluids!  
Vacuum use only!

Portable vacuum box, specification as VB 01. An additional connection on the box permits the simultaneous generation of vacuum and extraction of fluid. A fluid level indication permits the contents of the box to be checked.

- connection for workshop compressed air system
- also suitable for ABS
- 11 litres capacity
- with drain valve
- with level indication

- 1 VB 01.1 vacuum box with fluid level indication**
  - 1 venturi tube**
  - 1 extraction hose with connector, 2.50 m (8.2 ft)**
  - 1 rubber angled adapter (UNW 01)**
- Delivery in paper box

## Accessories for VB 01/VB 01.1

**UNFB 03**

**100212**



### Refilling container for the refilling of brake fluid

Refilling container for the refilling of brake fluid. The container can be put directly on the brake fluid container. 2nd possibility: suspending the refilling container by means of the suspension hook, stick universal adapter BAU on the brake fluid container and effect connection. The brake fluid stops running automatically as soon as the brake fluid container is full.

- scaled collecting tank with hook
- capacity 1.0 litre

**1 brake fluid-resistant container 1.5 l**

**1 hose Ø 13 mm, 1.00 m (3.3 in.)**

**1 hose Ø 6 mm, 1.10 m (3.6 in.)**

Delivery in paper box

**UN 05**

**100211**



### Vacuum brake bleeder

Vacuum brake bleeder for connection to compressed air; for brake fluids, with hand valve. Can also be used to bleed TDI engines when the tank was empty.

- scaled collecting tank
- capacity 600 ml

**1 brake fluid-resistant container with hand valve**

**1 hose Ø 9 mm, 2.00 m (6.5 ft) long**

**1 hose Ø 6 mm, 1.00 m (3 ft) m long**

**1 rubber angled adapter (UNW 01)**

Delivery in paper box

**ET 368**

**121384**



### Bleeder set for CDI engines

Bleeder set for Mercedes-Benz CDI engines. Used after replacing the fuel filter or prior restart after empty tank. Bleeder set is used in conjunction with VB 01/VB 01.1 and UN 05.

**VBA 04**

**100814\_1**



### Universal adapter for emptying container or adjusting the filling level

Universal adapter, suitable to empty containers with a narrow cross-section or to adjust the level in the brake fluid system. The adapter can only be used in conjunction with the vacuum box VB 01. Accessory to the vacuum box VB 01.

- with hose 2.5 m.



## Brake bleeder service unit

Brake service unit for maintenance and leak tests, draining brake systems and hydraulic clutches

You can find the list of the available adapters at our website at Service, Downloads, in "Adapter list for brake tester".

For this purpose you also can scan the QR-code.



BSG



### Brake service unit for maintenance and leak tests, draining brake systems and hydraulic clutches

Brake service unit for maintenance and leak tests, draining brake systems and hydraulic clutches.

You can choose between:

- 12 VDC vehicle battery
- 110 VAC mains voltage
- 230 VAC mains voltage

One advantage of service units is the automatic shut-off function when the brake fluid container is empty. The unit is connected to the brake system at the expansion tank of the master brake cylinder. B 611 adapter suitable for many vehicles included. Additional adapters are available depending on the vehicle type.

The portable basic units can easily be supplemented with the **FW** cart depending on the unit voltage (see table and article description on next page).

- automatic shut-off function when the brake fluid container is empty
- 8 unit models available
- for DOT 3, DOT 4, DOT 4 Plus and DOT 5.1 brake fluid
- leak test of brake and clutch system
- steplessly adjustable operating pressure from 0 to 4 bar / 0 to 58 psi

When using the cart, a brake fluid container with a capacity of up to 20 liters can be mounted. With the unit models BSG 110\_FWDL and BSG 230\_FWDL, an extraction unit for the expansion tank is integrated in the cart.

**1 BSG brake service unit**

**1 B 611 adapter**

FW



### Transport cart

The cart is the ideal addition to the BSG 012\_V3, BSG 110\_V3 and BSG 230\_V3 portable brake service units. The unit is screwed to the cart using a prepared fastening option.

An original container with a capacity of up to 20 liters can be transported on the back. The container is secured with a locking strap.

The extraction unit includes a spiral hose including a filter. The catch container (1 liter capacity) can be removed quickly and easily with a rapid-action coupling.

Depending on the unit voltage of the brake service unit, 3 models are offered, see table below.



Model	Ref. No.	Power supply	Container mount	Catch bottle with hose	Transport Cart	Extraction unit
BSG 012_V3	100505_1	12 VDC	up to 5 l	-	-	-
BSG 012_Motorrad_V3	100505_3	12 VDC	up to 5 l	-	-	-
BSG 110_V3	100506_1	110 VAC	up to 5 l	-	-	-
BSG 230_V3	100507_1	230 VAC	up to 5 l	-	-	-
BSG 012_FW	100509_1	12 VDC	up to 20 l	X	X	-
BSG 110_FW	100510_1	110 VAC	up to 20 l	X	X	-
BSG 230_FW	100508_1	230 VAC	up to 20 l	X	X	-
BSG 110_FWDL	100512_1	110 VAC	up to 20 l	X	X	X
BSG 230_FWDL	100511_1	230 VAC	up to 20 l	X	X	X
FW	100513_1	-	up to 20 l	-	X	-
FW 110DL	100513_2	110 VAC	up to 20 l	-	X	X
FW 230DL	100513_3	230 VAC	up to 20 l	-	X	X

## Brake bleeder adapter kits

BAK 01

100689\_1



### Brake bleeder adapter kit (asia)

Brake bleeder adapter kit, used when servicing brake and ABS systems. Selected adapters for the connection to brake fluid reservoirs on Asian vehicles.

1 adapter B 633 (100633\_1)

1 adapter B 685 (100685)

1 adapter B 686 (100686)

1 adapter B 687 (100687)

1 adapter B 688 (100688)

Delivery in solid plastic case

BAK 03

100690\_2



### Brake bleeder adapter kit (asia, us, eu)

Brake bleeder adapter kit for use during brake and ABS maintenance. The range of connectors for the brake fluid reservoir ensures suitability for use on vehicles of European, Asian and American manufactures.

1 adapter B 611W (100611\_2)

1 adapter set B 612W (100612\_2)

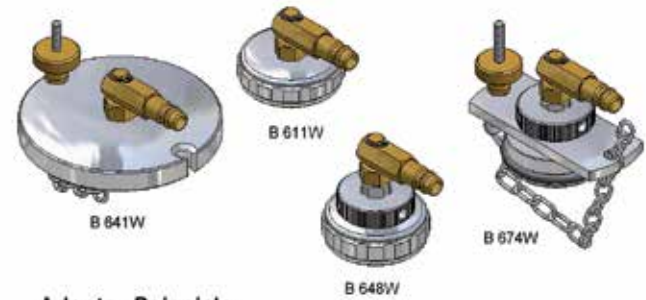
1 adapter B 641W (100641\_2)

1 adapter B 668W (100668\_2)

1 adapter B 674W (100674\_2)

Delivery in solid plastic case

BAK 05



### Adapter Beispiele

### Brake bleeder adapter kit (standard)

With the composition of the following brake bleeder adapter kits, average values for the most frequently used B-adapters in the passenger car sector were used. The adapters are 90° angle versions for simpler application.

### Delivery in solid plastic case

Code	Ref No.	Description
BAK 05_Basic_LR	101247_1	3 attachable angle adapters B 611W, B 648W, B 668W
BAK 05_Upgrade_LR	101248_1	5 attachable angle adapters B 612W (2-part), B 616W, B 635W, B 641W, B 674W
BAK 05_Master_LR	101249_1	8 attachable angle adapters B 611W, B 612W (2-part), B 616W, B 635W, B 641W, B 648W, B 668W, B 674W

BAK 06\_LR

101251\_1



### Brake bleeder adapter kit

Scope of delivery consists of 4 adapters B 668F, B 611W, B 627, B 641

4 adapters B 668F, B 611W, B 627, B 641

Delivery in solid plastic case

BAK 09

101257\_2



### Brake bleeder adapter kit

Scope of delivery consists of 5 adapters B 600WS, 616, 648W, 668W, 678WS

Delivery in solid plastic case

**BAK 10**

**101257\_1**



**Brake bleeder adapter kit**

Scope of delivery consists of 6 adapters B 600WS, 616, 624, 648W, 668W, 678WS

**Delivery in solid plastic case**

**BAK 11**

**101258\_1**



**Brake bleeder adapter kit**

Scope of delivery consists of 5 adapters B 616, 624, 648W, 668W, 691

**Delivery in solid plastic case**

**MBAK**

-



**Brake bleeder adapter kit (motor and quad bike)**

Brake bleeder adapter kit, specifically for motor and quad bike brake system maintenance. The adapter configuration is designed to guarantee use with almost all models produced by the named manufacturers.

**Our supply range contains the following variants:**

Code	Ref No.	Description
MBAK_BMW	101221_1	3 attachable angle adapters, MBA 10W, MBA 11W, MBA 12W
MBAK_Honda	101219_1	6 attachable angle adapters, MBA 13W, MBA 14W, MBA 15W, MBA 16W, MBA 17W, MBA 18W
MBAK_KTM	101220_1	9 attachable angle adapters, MBA 1W, MBA 2W, MBA 3W, MBA 4W, MBA 5W, MBA 6W, MBA 7W, MBA 8W, MBA 9W
MBAK_Peugeot	101250_1	5 attachable angle adapters, MBA 34W, MBA 37W, MBA 38W, MBA 39W, MBA 40W
MBAK_Piaggio	101237_1	5 attachable angle adapters, MBA 09W, MBA 33W, MBA 34W, MBA 35W, MBA 36W
MBAK_Suzuki	101236_1	5 attachable angle adapters, MBA 14W, MBA 29W, MBA 30W, MBA 31W, MBA 32W
MBAK_Yamaha	101231_1	7 attachable angle adapters, MBA 05W, MBA 19W, MBA 20W, MBA 21W, MBA 22W, MBA 23W, MBA 27W

## Brake line bending tools

**BBW\_Set 01\_LR**

**400080\_1**



**Brake line bending tool set**

with 4 clamps for the fixation of the brake lines (for outside diameter 4,75 mm) and a brake line bending pliers, in stable case with CNC milled foam inlay. Smoothly bends copper, brass, aluminum, and thin-wall steel without crimping tubing.

Option: Conversion kit for brake lines with diameter 6 mm, 8 mm or 10 mm.

**BBW\_Set 02\_LR**

**400081\_1**

**Brake line bending tool set**

Application and content as described in BBW\_Set 01\_LR, but without bending pliers. Brake line bending tool set, with 4 clamps for the fixation of the brake lines, in Box with CNC milled foam insert.

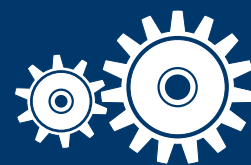




## Transmission

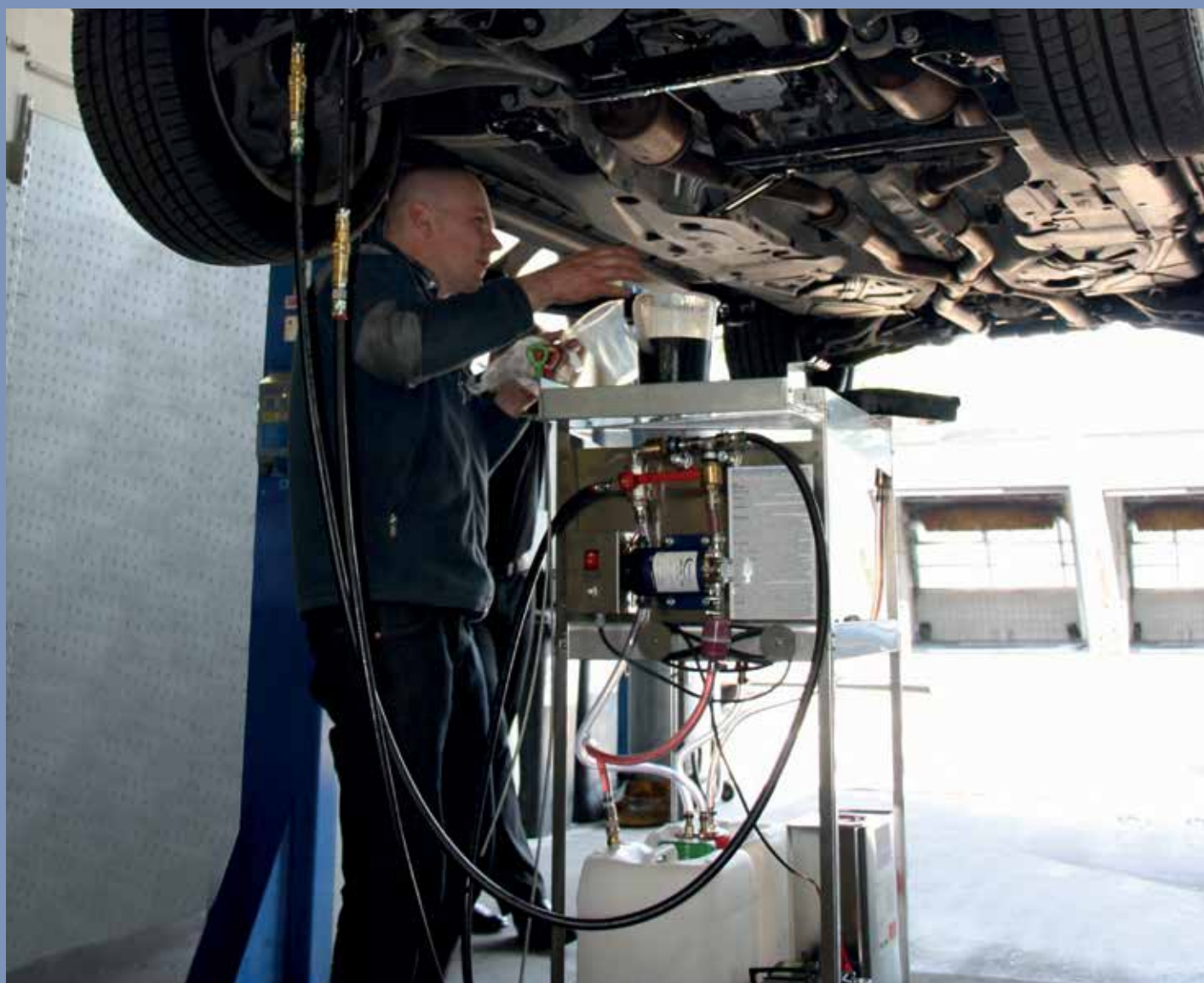
- Service station for automatic transmission oil
- Gearbox oil tester
- suction, refilling and flushing and scavenge of gearbox-oil
- Pressure tester for automatic gearboxes

### TRANSMISSION



You can find the list of the available adapters at our website at Service, Downloads, in "Adapter list for Automatic transmission oil change device (AGSG)".

QR-code to the adapter lists



## Transmission

AGSG 12VDC\_W

043001\_1



### Service station for automatic transmission oil

Mobile service station made of stainless steel is suitable for holding required tools, replacement parts, new transmission oil and old oil which can be drained into the service station. This durable stainless steel service station is designed for long-term usage.

- operated with 12 VDC
- transmission oil changing rate of minimum 95 %
- easy and clear operation
- one device for fast change of transmission oil and flushing of the whole transmission system
- many adapters are available: MB, BMW, Audi, VW, ZF, Aisin, etc.
- practice oriented
- clean removal of the hydraulic device or oil pan
- no oil drops on the floor and no oil splatter towards the mechanic

Our cleanser, developed to fit with automatic transmission applications removes abrasion products and contaminations, bounds Glykol residues. The cleanser is not a part of the delivery, available at: [www.automatikoelwechselsystem.de](http://www.automatikoelwechselsystem.de)

AGSG\_12VDC\_H

043002\_1



### Adaptable, mobile service station for automatic transmission oil

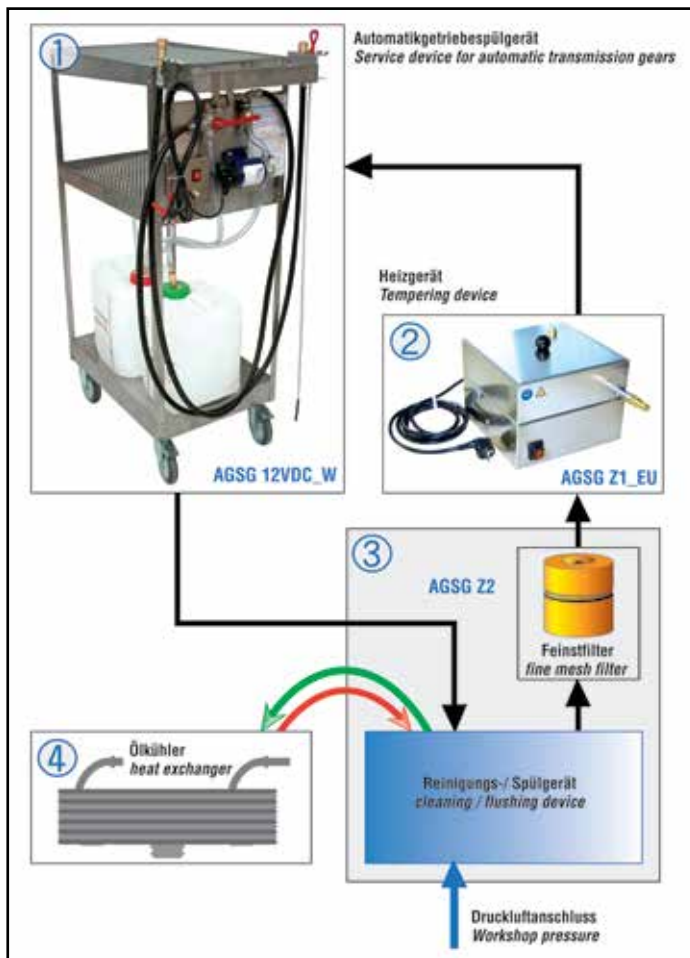
Used to flush effectively gearboxes and change transmission oil. Easy attachment to an existing tool cart. With Intelligent adapter systems for nearly all automatic gear boxes.

- operated with 12 VDC
- transmission oil changing rate of minimum 95 %
- one device for fast change of transmission oil and flushing of the whole transmission system
- our cleanser, developed to fit with automatic transmission applications, removes abrasion products and contaminations, bounds Glykol residues
- many adapters are available: Aisin, Audi, BMW, Jatco, MB, VW, ZF, etc.
- extendable by AGSG\_W, mobile service station made of stainless steel

Our cleanser, developed to fit with automatic transmission applications, removes abrasion products and contaminations, bounds Glykol residues. The cleanser is not a part of the delivery, available at: [www.automatikoelwechselsystem.de](http://www.automatikoelwechselsystem.de)

**The tool cart is no part of the scope of delivery.**

## Accessories



AGAG\_Z1

043007



### Heater, accessorie AGSG

Accessory for Service station for automatic transmission oil.  
For heating up the ATF to approximately +90 °C, to open the thermostat (between automatic transmission and automatic transmission cooler) safely and therefore the entire cycle.

AGSG\_Z2

043008\_1

### Flusher oil cooler, accessories AGSG

Extreme high cleaning results. Pulsating cleansing/flushing of the oil cooler with stroked frequented compressed air. The specially designed fine filter guaranties that no pollution remains in the cleaning system.

AGSGA



### Adapter for Service station for automatic transmission oil

You can find the list of the available adapters at our website at Service, Downloads, in "Adapter list for Automatic transmission oil change device (AGSG)". See QR-code page 81.

## Diagnostic

GP 01

110901\_1



### Gearbox oil tester

Leaks in heat exchangers can cause coolant to mix with gearbox oil, leading the gearbox being damaged, possibly beyond repair. The centrifugal device in the tester provides evidence of coolant in the gearbox oil, down to as little as 0.01%.

- safe and easy to use
- free of wear measurements
- detailed visual display of results

**1 plexiglass test cylinder**  
**1 hand centrifuge (for bench mounting)**  
**1 rotor with counterweight**  
**disposable pipettes**  
**Delivery in paper box**

GP 01\_BM

110901\_2



### Gearbox oil tester, operated by column drill

Engine coolant can react with transmission fluids and reduce or eliminate the lubrication of a transmission system. The transmission system can be damaged (irreparable). By centrifuging of an oil sample the proportion of coolant in the transmission fluid can be determined.

- CNC machined bracket for holding in drill chuck
- small sample of (possible) contaminated transmission fluid required
- easy and clear to operate
- no liquid reaction fluids required
- wear free measurement
- visually detailed result

- 1 plexiglass test cylinder
- 1 rotor with counterweight
- disposable pipettes

## Filling and flushing

HAP 01.1

060410



### Pressure and vacuum pump, for the suction, the refilling and the scavenge of gearbox-oil

Pressure and vacuum pump, aluminium version, for the suction, the refilling and the scavenge of gearbox-oil. The facility for extracting and refilling gearbox oil is provided by two connecting nipples.

- pressure performance min. 2 bar
- vacuum performance appr. 0.8 bar
- 2 connections, pressure or vacuum
- used in conjunction with collecting tank HAP 15

A container HAP 15 with contents scale (1.5 l capacity), which can be connected to the unit, permits the temporary storage of the oil.

Delivery in paper box

GFP 01 , GFP 01.1

060430\_1 , 060430\_3



### Gear oil filling pump

The gear oil filling pump with light metal construction is ideal for filling various manual transmission types, transfer gearboxes and differentials with gear oil. The various GFPA gear oil filling adapters can be used for diverse vehicle manufacturers and can be safely and rapidly replaced via quickconnect coupling at the filling hose. Discharge-safe work is possible with the closable ball valve.

A plastic container with scale and 10 litre capacity enables filling in one work process.

#### Scope of supply GFP 01 (060430\_1):

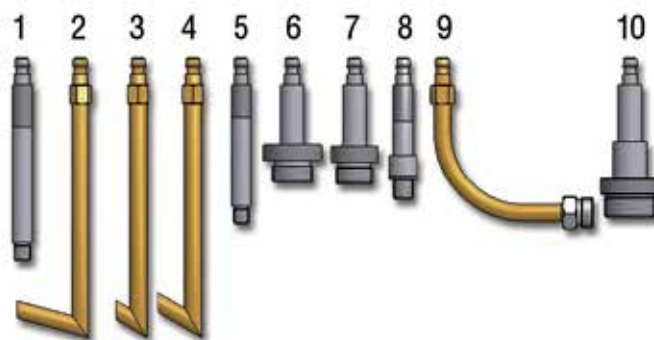
- 1 gear oil filling pump GFP 01 with filling hose, length 2.00 m (6.6 ft)
- 1 plastic container, 10 litre capacity
- 5 gear oil filling adapters GFPA 03, 04, 05, 06, 07

#### Scope of supply GFP 01.1 (060430\_3) - supply without adapters

- 1 gear oil filling pump GFP 01 with filling hose, length 2.00 m (6.6 ft)
- 1 plastic container, 10 litre capacity

GFPA

see table



### Adapters for gear oil filling pump

Available adapters for gear oil filling pump:

No	Code	Art No.	suitable for
1	GFPA 01	060433_1	thread 1/8-27 NPT (Ford)
2	GFPA 02	060434_1	long angle form (BMW)
3	GFPA 03	060435_1	short angle form (VW/Audi)
4	GFPA 04	060436_1	medium angle form (VW/Audi)
5	GFPA 05	060437_1	thread M 10x1 (VW/Audi)
6	GFPA 06	060438_1	thread M 24x1,5 (VW/Audi)
7	GFPA 07	060439_1	thread M 22x1,5 (VW/Audi)
8	GFPA 08	060440_1	thread M 12x1,5 (MB)
9	GFPA 09	060441_1	thread M 18x1,5 (Toyota)
10	GFPA 10	060442_1	thread M 30x1,5 (VW/Audi)

## Pressure test

BDP 09

100129



### Pressure tester for automatic gearboxes

Tester recommended by Porsche AG. The tester permits the identification of faults in the hydraulic control of automatic gearboxes.

The pressure gauges are fixtures in the case and are positioned at an angle of 15° to ensure that they can be easily read. For use only in conjunction with the special Porsche tools 9170 and 9300, the tester can be used on Porsche models 924 and 928. The two pressure gauges are each equipped with a 3 m long hose line for convenient testing.

**1 NG 100 pressure gauge, range 0...10 bar  
with finely graduated scale, class 1**

**1 NG 100 pressure gauge, range 0...25 bar  
with finely graduated scale, class 1.0**

**2 x 3.00 m (10 ft) hose lines**

**2 x M 10x1 connector (BDA 04)**

**Delivery in solid plastic case**

OPA 01

040585



### Oil pressure tester for automatic transmissions

Oil pressure tester for automatic transmissions according to the transmission- i.e. the manufacturer's specification.

Suitable for

- BMW, Ford, Honda, Mercedes Benz, Mitsubishi, Opel, Renault
- range 0...25 bar

High quality gauge with solid protective rubber cap DS 63 mm (2 1/2"), with pressure lead 3.00 m long (10 ft).

**1 oil pressure tester, test hose with quick coupling**  
**6 standard connectors ANK 4, 18, 20, 55, 60, 61**  
**Delivery in solid plastic case**

DEM



### Data Acquisition Module

DEM is suitable to measure simultaneous/synchronized different physical parameters as pressure, temperature, flow and display those and store measurement results on an external laptop.

- For multiple use
- 4 measuring channels 0...10 VDC or 4 measuring channels 4...20 mA
- Sensors and measuring ranges are detected automatically
- Measurement data visualized on the PC screen
- Curve progressions can be displayed
- Data can be logged and saved to a file
- Measurement data can be further processed with Microsoft Excel

**For example:**

**DEM 01**

**4 sensors with 40 bar, class 1.0,  
for diagnosis of automatic transmission.**

A detailed list of GFPA adapters can be found on the Internet at:  
[www.autotestgeraete.de/service/downloads](http://www.autotestgeraete.de/service/downloads)

To adapter list GFPA:





## Hydraulic Testing devices

For testing and diagnosing hydraulic systems of passenger cars, trucks, utility vehicles and other vehicles.

- Pressure
- Temperature
- Flow rate
- Min- max values
- measuring, indicating, printing and saving measurement results
- Differential pressure measurement

HYDRAULIC



QR-code on the topic of  
Hydraulic Testing devices



## HPGD 1000\_LR



### Hydraulic test device, digital

This device gives the operator the opportunity to perform all test- and diagnosis-processes on hydraulic systems. This device is measuring and indicating all relevant physical value. Pressure, temperature and flow.

- easy operation and handling
- instant measurement results
- pressure indication 0...250 bar, class 0.5
- temperature indication 0...125° C, class 1.0
- calibrated with hydraulic oil

#### Hydraulic load:

Via a pressure resistant gaged, the hydraulic path can be completely blocked or a determined flow can be set.

#### Versions:

Description	Flow range	Ref No.	Application (example)
HPGD 1000_LR_01	7,5...75 l/min	041902_1	power steering
HPGD 1000_LR_02	15,0...300 l/min	041903_1	implements
HPGD 1000_LR_03	40,0...600 l/min	041904_1	heavy duty hydraulic drives

#### Delivery without high pressure hoses

## HPGD 2000



### Hydraulic system tester, digital

For testing and diagnosing hydraulic systems. All relevant physical values are indicated simultaneously. Same function and same fittings as HPG 1000, but with digital sensors and software to display, record and print all datas.

#### features:

- higher measuring accuracy
- better readout
- log, save and printing measuring values

#### visualization of datas:

- chronologic data
- current value
- max. and min. values
- easy handling
- measuring results in short test time
- pressure indication 0...250 bar, class 0.5
- temperature indication 0...125° C, class 1.0
- flow range, see table below, class 0.5

#### Hydraulic load:

Via a pressure resistant gaged, the hydraulic path can be completely blocked or a determined flow can be set.

#### Hydraulic connections:

L15/L22 connection, outside thread (inlet and outlet).

Code	Flow range	Ref No.	Application (example)
HPGD 2000_LR_01	7,5...75,0 l/min	041905_1	power steering
HPGD 2000_LR_02	15,0...300 l/min	041906_2	implements
HPGD 2000_LR_03	40,0...600 l/min	041907_3	heavy duty hydraulic drives

- 1 Pressure sensor**
- 1 Flow sensor**
- 1 Temperature sensor**
- 1 Laptop (only on request)**
- 1 Software**
- 1 Hub (for sensors)**

#### Delivery without high pressure hoses

#### Delivery in solid plastic case



DM 100\_LR

-



### Digital pressure gauge

Digital pressure gauge with different measurement ranges and connections.  
For a higher measurement accuracy and easier readability than analog devices.

- switchable bar/psi
- with display backlight
- MIN/MAX-memory
- accuracy class: 0.5 % FS
- different pressure connections on request
- other measuring ranges between -1 to 2500 bar on request
- composition of different measuring leads and testing adapters on request

Accessories on request.

Pressure measurement range	Range of application
-50...+ 50 mbar	Pressure crankcase
-200...+200 mbar	Pressure crankcase
-1...16 bar	Vacuum, Oilpressure, Fuel pressure
0...60 bar	Compression
0...600 bar	Hydraulic
0...2500 bar	Common Rail, Hydraulic

Code	Range of application
CRPD 04	Pressure tester for static and dynamic high-pressure pump testing
CRPD 2500	Common rail high pressure tester
FP 01	Fuel supply pump testers -1 ... 3 bar
FP 03	Fuel supply pump testers -1 ... 9 bar
LRD 180_AK2	Fuel system pressure tester with compound gauge for vacuum and pressure indication
LTBGD 03_EV	Tightness test of battery housings
LTBGD 05_EV	Tightness test of battery housings

UDD\_01\_LR\_S

040332\_1



### Universal, digital pressure measurement device

Universal, digital pressure measurement for connection of one pressure sensor.

This device allows the conversion from analogue measurement to digital measurement. The measurement results can be transferred to a customer's diagnostic system.

The measurement device is able to provide analogue proportional signals corresponding to the measurement results. This device is available with calibration certificate (as option).

Also available with USB interface and software to visualize, capture and save the measured results.

#### With analogue, proportional output signal available (on request):

- 0...5 VDC
- 0...10 VDC
- 4...20 mA
- further ranges on request

Pressure ranges and applications, see table on next page.

#### 1 Pressure measurement device UDD 01\_LR\_S

1 CD with user software

1 USB connection cable

Delivery in solid plastic case with CNC cutted foam inlay to store 4 pressure sensors.

UDD 01\_LR\_S\_Set

040333\_1

UDD 02\_LR\_S

040334\_1



## Universal, digital pressure measurement device including 4 sensors

Universal, digital pressure measurement for connection of one pressure sensor.

This device allows the conversion from analogue measurement to digital measurement. The measurement results can be transferred to a customer's diagnostic system. The measurement device is able to provide analogue proportional signals corresponding to the measurement results. This device is available with calibration certificate (as option).

Also available with USB interface and software to visualize, capture and save the measured results.

Pressure ranges and applications, see table below.

### With analogue, proportional output signal available (on request):

- 0...5 VDC
- 0...10 VDC
- 4...20 mA
- further ranges on request

Pressure ranges and applications, see table below.

### 1 Pressure measurement device UDD 01\_LR\_S

1 CD with user software

1 USB connection cable

4 pressure sensors

Delivery in solid plastic case with CNC cutted foam inlay to store 4 pressure sensors.

## Universal, digital pressure measurement device with differential pressure indication

Universal digital differential pressure measurement device for connecting two pressure sensors.

This device allows the conversion from analogue measurement to digital measurement. Two sensors with the same measuring range must be connected for differential pressure measurement.

With analogue, proportional output signal available.

The measurement results can be transferred to the customer's diagnosis system. This device is available with calibration certificate (as option).

Also available with USB interface and software to visualize, capture and save the measured results.

### Available proportional output signals (on request):

- 0...5 VDC
- 0...10 VDC
- 4...20 mA
- further ranges on request

Pressure ranges and applications, see table below.

### 1 Pressure measurement device UDD 02\_LR\_S

1 CD with user software

1 USB connection cable

Delivery in solid plastic case with CNC cutted foam inlay to store 4 pressure sensors.

## Sensor types and applications

Sensor	Ref. No	Pressure measurement range	Application
DMU 01_-1...+16 bar_LR1	010 805_1	-1 ... 16 bar	Vacuum, Oil pressure, Fuel pressure
DMU 01_0...+60 bar_LR1	010 806_1	0 ... 60 bar	Compression
DMU 01_1...600 bar_LR1	010 807_1	0 ... 600 bar	Hydraulic
DMU 01_1...2500 bar_LR1	010 808_1	0 ... 2500 bar	Common Rail, Hydraulic

**UDD\_02\_LR\_S\_Set**

**040335\_1**



**Universal, digital pressure measurement device with differential pressure indication, incl. 4 sensors**

Universal digital differential pressure measurement device for connecting two pressure sensors.

This device allows the conversion from analogue measurement to digital measurement. Two sensors with the same measuring range must be connected for differential pressure measurement.

With analogue, proportional output signal available. The measurement results can be transferred to the customers diagnosis system. This device is available with calibration certificate (as option).

Also available with USB interface and software to visualize, capture and save the measured results.

**Available proportional output signals (on request):**

- 0...5 VDC
- 0...10 VDC
- 4...20 mA
- further ranges on request

Pressure ranges and applications, see table below.

- 1 Pressure measurement device UDD 02\_LR\_S**
- 1 CD with user software**
- 1 USB connection cable**
- 1 pair pressure sensors (according to choice)**
- Delivery in solid plastic case with CNC cutted foam inlay to store 4 pressure sensors.**

**Range of application for all UDD-devices (examples).**

brake booster
fuel pressure
Common Rail start pressure
Compression
hydrostatic drives
hydraulic control systems

**DM 100-Set**

**Example**



**Digital measurement technology, case set, customized example**

Custom made case set for hydraulic measurement.

- 2 digital manometers (different pressure ranges)
- 4 hydraulic hoses
- 17 Adapter

Exemplary composition (see image) of different measuring leads and testing adapters on request.

**Delivery in solid plastic case**

HPKD 01\_LR

041909\_1



## Digital Hydraulic Measurement Kit

HPKD 01\_LR allows a fast and reliable diagnosis on all hydraulic systems.

Hydraulic Measurement Kit with digital pressure gauges for hydraulic systems. The integrated Min/Max-memory feature allows an overview of various test points. Accurate reading.

- Measurement range: 0...600 bar, digital pressure scale
- further adapters with different threads on request

**2 digital pressure gauges, diameter 100 mm, measurement range 0...600 bar**

**2 measurement hose, length 3 m each**

**2 test adapters 1/4"**

**1 adapter (to join two measurement hoses)**

**Delivery in solid plastic case**

HPK 01\_LR

041908\_1



## Analogue Hydraulic Measurement Kit

HPK 01\_LR allows a fast and reliable diagnosis on all hydraulic systems

Hydraulic Measurement Kit with analogue pressure gauges for pressure measurement in hydraulic systems.

- Measurement range 0...600 bar
- further adapters with different threads on request

**2 analogue pressure gauges, diameter 100 mm, measurement range 0...600 bar**

**2 measurement hose, length 3 m each**

**2 test adapters 1/4"**

**1 adapter (to join two measurement hoses)**

**Delivery in solid plastic case**



## Our customers

- Manufacturers of passenger cars and trucks
- Wholesalers and workshop chains
- Motorcycle manufacturers
- Testing organizations and experts
- Automobile clubs
- Agricultural and construction machines
- Army and navy
- Shipping industry
- Educational institutions



## DEAR CUSTOMER,

with us, intuition has many faces. We at Leitenberger find solutions for applications in all areas, build patterns and develop prototypes until everything fits, up to and including serial production.

If you know exactly what you want, you rely on quality, know-how and individuality, and have specific expectations of your equipment then we are the right partner for you.

That is because we have been meeting new technical challenges daily for over 40 years. We develop, produce, measure, inspect and test, use our know-how in the process and follow our intuition.

## ***Test devices engineered and made in Germany***

- In-house development and production of all devices until production readiness
- Supplier independence
- Comprehensive technical know-how for efficient solutions
- Customer-oriented actions with full service
- ISO-certified quality.

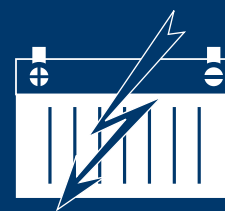
### **Autotestgeräte LEITENBERGER GmbH**

We develop intelligent products for unusual requirements.

## Electrical/Charging System

- Multifunction circuit tester
- Battery tester
- Electronic protection devices
- Resettable electronic fuse replacement
- Code maintainer
- Universal multimeter
- Glow plug tester
- Illumination tester, Trailer tester
- Illumination tester, Tractor Tester
- Accessories

### ELECTRIC & CHARGING SYSTEM



QR-code on the topic of  
Electrical/Charging System



## Electric circuit testers

Circuit testers like AZ 172, AZ 173, AZ 174\_V2, AZ 175 are exclusively designed for automotive electrical systems. Not suitable for any electronic application.

**AZ 172**

**070105**



### Multifunction circuit tester for use on electrical systems

The tester incorporates an automatic circuit breaker (7.5 V) which can be activated as often as required.

- standard version supplied with 6.00 m (20 ft) cable
- operating range 6...24 V

#### Testing capabilities:

- operation of electrical components (cooling fan motors, electric window motors, electric fuel pumps, relays, lamps, etc.)
- continuity test (switches, relays, fuses, cable runs)
- verification of poor earth connections
- self test
- bad ground indication
- polarity testing with red/green LED indicator lamps
- with 7.5 A thermal release

**1 circuit tester AZ 172**

**1 battery connecting lead 6.00 m (20 ft) with clamps**

**1 auxiliary clamp with 0.50 m (20 in.) lead**



**AZ 173**

**070106**



### Multifunction circuit tester for use on 12...24 V electrical systems

Standard version supplied with 6.00 m (20 ft) cable.

Testing capabilities as described at AZ 172 plus additional functions:

- illumination of test location
- acoustic polarisation signal (+) (-)

**1 circuit tester AZ 173**

**1 battery connecting lead 6.00 m (20 ft) with clamps**

**1 auxiliary clamp with 0.50 m (20 in.) lead**

**AZ 174**

**070201\_1**



### Multifunction circuit testers for automotive electrical systems

- power supply 9...48 VDC
- measurement range 0...48 VDC
- replaceable test tip
- detection of DC voltage, AC voltage or ground connection
- bad ground indication/continuity test
- with sounding device for acoustic signals
- power up components
- fully isolated battery clamps
- bright LED light

**1 circuit tester AZ 174**

**1 battery connecting lead 6.00 m (20 ft) with clamps**

**1 auxiliary clamp with 0.50 m (20 in.) lead**

**Delivery in solid plastic case**



AZ 174\_V2

070203\_2



### Multifunction circuit tester for automotive electrics with integrated voltage and resistance measurement

Multifunctional testing device for automotive electrics with integrated voltage and resistance measurement. Indication is a 3-digit LC display. The integrated circuit breaker (thermal fuse 7.5 A) can be reactivated as often as required. Testing possibilities are as specified with AZ 172.

- power supply 9...28 V
- measurement range 0...28 V
- LC display, resolution 0.1 V
- LED red/green for polarity indication
- measurement of earth connections with indication in LC display
- resettable thermal fuse
- illumination of test location

**1 circuit tester AZ 174\_V2**  
**1 battery connecting lead 6.00 m (20 ft) with clamps**  
**1 auxiliary clamp with 0.50 m (20 in.) lead**  
**Delivery in solid plastic case**

AZ 175

070204\_1



### Multifunction tester for vehicle electrical systems employing power inputs from 9 to 48 V

A keyboard and two-digit LC display provide menu guidance to the individual testing modes. An electronic fuse protects the tester and the tested object from damage in the event of a short circuit. The tester also features lighting for the test object and an acoustic detecting sensor.

- power supply 9...48 V

- measurement range 0...48 V
- test result resolution 0.1 V
- four different testing modes
- electronic fuse
- illumination of test location
- acoustic detecting sensor for polarity displays and warning signals
- two-digit, red/green illuminated LC display

#### Testing facilities:

- voltage testing
- identification and storage of the maximum and minimum voltages during voltage testing
- determination of voltage peaks
- determining polarity
- operating electronic components and their fault diagnostics
- continuity test
- determining poor earth connections
- self test

**1 circuit tester AZ 175**  
**1 battery connecting lead 6.00 m (20 ft) with clamps**  
**1 auxiliary clip with 0.50 m (20 in.) lead**  
**Delivery in solid plastic case**

AZ 175\_MK

070204\_2



### Multifunction circuit tester, 9 to 48 V

Multifunction Tester, 9 to 48 V. See AZ 175 for unit description. Includes high-quality measuring set designed especially for use in automotive measuring technology.

The various measuring adapters can be used by removing the test tip from the tester and using an insulated extension cable.

**1 circuit tester AZ 175\_MK**  
**1 battery connecting lead 6.00 m (20 ft) with clamps**  
**1 auxiliary clip with 0.50 m (20 in.) lead**  
**1 alligator clip, fully insulated**  
**1 cable puncturer (for intrusive contact)**  
**1 test tip, needle-shaped (back probing probe)**  
**1 „mini“ test tip, needle-shaped with cable puncturing adapter (back probing probe)**  
**Delivery in solid plastic case**

AZ 176

070205\_1



## Multifunction circuit tester for automotive electrical systems

- power supply 9...48 VDC
- measurement range 0...48 VDC
- replaceable test tip
- peak to peak measurement
- detection of DC voltage, AC voltage or ground connection
- peak to peak setting
- bad ground indication
- continuity test
- with sounding device for acoustic signals
- power up components
- fully isolated battery clamps
- bright LED light
- illumination of test location

**1 circuit tester AZ 176**

**1 battery connecting lead 6.00 m (20 ft) with clamps**

**1 auxiliary clip with 0.50 m (20 in.) lead**

**Delivery in solid plastic case**

## Tester for battery and charging system

DBP 03P

070712\_1



## Battery tester with digital display and temperature compensation

Battery tester with digital display and temperature compensation (below 0 °C), suitable batteries and charging systems. An integrated printer allows the documentation of the testing results.

### Test facilities:

- voltage testing, 1...30 VDC
- cold start current testing: JIS battery code
- battery condition, ok / not ok
- suitable for 6 V and 12 V batteries
- suitable for 6 V, 12 V and 24 V charging systems
- selection of language
- with integrated printer

**Delivery in paper box**

## Electronic protection

ES 01, ES 02

071203, 071204\_1



### Electronic protection device of the vehicle's electronic components

ES 01, for protection of the vehicle's electronic components. Occuring high voltages will be absorbed by this instrument. Connection to battery voltage 12 V through red and black battery clamps.

ES 02, equivalent version of ES 01, but automatic change-over from 12...24 V.

Technical Data	ES 01	ES 02
Battery voltage	12 V	12...24 V
Voltage suppression	> 15 V	> 25 V
Electrical input	2,0 W (2 ms), 0,05 W (contin.)	12 V 2,0 W (2 ms), 0,05 W (contin.) 24 V 3,7 W (2ms), 0,05 W (contin.)
Battery terminal connectors each with	0,25 m cable (2,5 mm <sup>2</sup> )	0,40 m cable (2,5 mm <sup>2</sup> )
Dimensions L/W/H	104 x 61 x 29 mm	104 x 61 x 29 mm
Weight	140 g	150 g

Delivery in paper box

Fuse Master

071214\_1



### Resettable electronic fuse replacement instrument for short circuits or troubleshooting in the electrical circuit

Resettable electronic fuse replacement instrument which plugs into an appropriate socket instead of the fuse. Ideal for short circuits or troubleshooting in the electrical circuit, given that the faulty fuse doesn't need to be permanently replaced.

- operating range 12 V
- adjustable fuse ratings: 5 A, 7.5 A, 10 A, 15 A, 20 A, 25 A and 30 A
- processor controlled
- fuse rating adjustable via pushbutton
- the set value fuse rating is displayed by LED
- overload current indicated by acoustic and visual warnings
- reset button (for overload current)
- two additional fuse adapters for mini- and torpedo-fuses
- direct power supply through the fuse socket

**1 fuse master with leads, length 1.00 m (3 ft)**

**1 adapter for mini fuse**

**1 adapter for torpedo fuse**

**Delivery in solid plastic case**

## Code maintainer

Code maintainers (emergency power units).

Whenever it is necessary to disconnect the vehicle's battery, so in case of maintenance jobs and repair works, particular measures have to be taken to prevent the loss of electronic data and codes (drive-away lock, radio codes, door opening, adjustment of seat and mirrors, etc.). In order to save the vehicle's electronic data, the use of code maintainers (emergency power units) is vital.

For a detailed view over LR-Code Maintainers (emergency power units), please consider the table below.

Description	NSV 01	NSV 02	NSV 03	NSV 03/1
Ref No.	071201_1	071202 RED LINE	071208	071209
built-in current supply		X		
with auxiliary battery only			X	X
mains alimantation 230V/50Hz AC	X			
accumulator alimantation		X		
connection to vehicle by means of cigarette lighter	X	X	X	X
polarization/ protected against	X	X	X	X
overload protection	X	X	X	X
incl. electronic protection	X	X	X	X
permissible				
on-board voltage	12 V	12 V	12 V	24 V
maximum output current	250 mA	2 A	2 A	2 A

**NSV 01**

**071201\_1**



### Emergency power supply for 12 V car electrical systems

Emergency power supply for 12 V car electrical systems.

Connection to the vehicle via cigarette lighter socket. Power supply to the instrument via 230 V mains lead. LED display for correct voltage connection. Acoustic warning and visual display indicate excessively high current consumption. Output current 250 mA.

**1 emergency power supply instrument NSV 01**

**1 power alimantation cable 3.00 m (9 ft) long**

**1 connecting cable 1.00 m (3 ft) long with cigarette lighter adapter**

**NSV 02**

**071202\_1**



**Code maintainer  
with built in accumulator**

Connected to vehicle by means of cigarette lighter adapter.

#### LED-indication for:

- capacity indication when device is switched on
- in case of accu voltage <10.5 V
- current flow
- accu charging
- accu filled

Details accumulator: voltage 12 V, capacitiy 1.2 Ah.  
Further technical details see table.

**1 code maintainer NSV 02**

**1 connecting cable with cigarette lighter adapter, length 1.50 m (4.3 ft)**

**NSV 03, NSV 03/1**

**041208, 071209**



**Code Maintainer, usable with  
external battery**

Code Maintainer, usable with external battery. Connected to vehicle via cigarette lighter.

- model NSV 03 for 12 V systems
- model NSV 03/1 for 24 V systems

Further technical details see table.

**1 code maintainer NSV 03**

**1 power alimantation cable with clamps, length 4.00 m**

**1 connecting cable with cigarette lighter adapter, length 1.50 m (4.3 ft)**

## Multitester

MT 07

041708



**Multimeter in rubber-protected plastic case, with rotary switch, 3 1/2 digit display**

Multimeter in rubber-protected plastic case, with rotary switch, 3 1/2 digit display. Automatic polarity indication and optical signal in case of overload, with storage of results.

Testing capability	Range	Accuracy	Resolution
Direct voltage (DC)	200 mV		100 $\mu$ V
	2 V		1 mV
	200 V		100 mV
	1 kV		1 V
Alternating voltage (AC)	200 mV		100 $\mu$ V
	2 V	$\pm 0.8\% + 3 \text{ dig.}$	1 mV
	20 V		10 mV
	200 V		100 mV
	750 V	$\pm 1.2\% + 3 \text{ dig.}$	1 V
Direct current (DC)	200 $\mu$ A		0.1 $\mu$ A
	2 mA		1 $\mu$ A
	20 mA	$\pm 0.8\% + 1 \text{ dig.}$	10 $\mu$ A
	200 mA		100 $\mu$ A
	2 A		1 mA
	10 A	$\pm 2\% + 10 \text{ dig.}$	10 mA
Alternating current (AC)	200 $\mu$ A		0.1 $\mu$ A
	2 mA		1 $\mu$ A
	20 mA	$\pm 1.0\% + 3 \text{ dig.}$	10 $\mu$ A
	200 mA		100 $\mu$ A
	2 A		1 mA
	10 A	$\pm 3\% + 10 \text{ dig.}$	10 mA
Resistance	200 Ohm		0.1 Ohm
	2 kOhm		1 Ohm
	20 kOhm	$\pm 0.5\% + 1 \text{ dig.}$	10 Ohm
	200 kOhm		100 kOhm
	2 MOhm		1 kOhm
	20 MOhm	$\pm 1\% + 2 \text{ dig.}$	10 kOhm

Diode test: Voltage < 3 V, short current appr. 1 mA

Continuity test: less than 150 Ohm

1 multimeter MT 07  
1 test lead set red/black

MT 701

041716\_1



**Multimeter in shock protected thermoplastic case with rotary switch, 3 1/2" illuminated digital display**

Multimeter in shock protected thermoplastic case with rotary switch, 3 1/2" illuminated digital display. Possibility to connect clamp-on current probe STZ 01 (0...400 A) and STZ 02 (0...1000 A).

1 multimeter  
1 test lead set red/black

MTi 801

041710\_1



**Insulation Resistance Tester**

As the EV (Electric Vehicle) and HEV (Hybrid Electric Vehicle) market is becoming larger, the importance of accurately measuring insulation resistance values is growing bigger and bigger.

With the new developed MTi 801 you have an accurate, reliable insulation tester with "analog" bar graph for voltage and resistant measurements, continuity and insulation test.

**With new features:**

- accurate and reliable measurement
- durable tester (3 m drop protection)
- bar graph shows an approximate analog representation of a measurement
- DMM Features (AC/DC voltages, resistance and continuity)
- CAT III 1000 V and CAT IV 600 V overload protection

# - 102 - Electrical/Charging System

MT 092

041721\_1



## Universal multimeter MT 092

Version and supplied unit equivalent to MT 09, but incl. supplementary clamp-on current probe STZ 01, 0...400 A.

1 multimeter MT 09

1 test lead set red/black

1 temperature sensor

1 inductive clamp

1 clamp current probe STZ 01 with flexible connecting lead red/black, length 1.60 m (4.6 ft)

Delivery in solid plastic case

MT 09

041719\_1



## Multimeter in rubber-protected plastic case,

Universal multimeter in shock-protected thermoplastic case. Illuminated LC-display, analogous meter. Overcharge protection with optical and acoustic signal. Automatic cut-off after 30 min.

### Basic functions of the rotary switch:

measuring of voltage AC and DC, measuring current AC and DC, Ohmmeter, continuity measuring, diode test, temperature, rotating speed, and frequency, etc.

### Key functions:

Hold = storage of measurements

REL = relative-measuring

REC = measuring of the max., the min. and the average value

RANGE = measuring range (+) or (-), trigger slope, no. of cylinder

DWL = dwell relation, continuity

% DUTY = choice of phase, frequency

DC / AC = switch between AC and DC or °F and °C

## Voltage

Function	Range	Resolution	Accuracy	Input impedance
DC V	4 V	1 mV	$\pm(0.3\% + 2 \text{ dgts})$	ca. 11 M $\Omega$
	40 V	10 mV		ca. 10 M $\Omega$
	400 V	0.1 V		
DC mV	1000 V	1 V	$\pm(0.75\% + 3 \text{ dgts})$	> 100 M $\Omega$
	400 mV	0,1 mV	$\pm(0.3\% + 2 \text{ dgts})$	

Function	Range	Resolution	Accuracy		Input impedance
			50 Hz - 60 Hz	45 Hz - 1 KHz	
AC V (45 Hz to 1K Hz)	4 V	1 mV	$\pm(0.75\% + 3 \text{ dig.})$	$\pm(2.5\% + 5 \text{ dig.})$	ca. 11 M $\Omega$
	40 V	10 mV			ca. 10 M $\Omega$
	400 V	0,1 V			
	750 V	1 V	$\pm(0.75\% + 5 \text{ dig.})$		

## Current

Function	Range	Resolution	Accuracy	Input impedance
DC A	400 $\mu$ A	0,1 $\mu$ A	$\pm(0.5\% + 1 \text{ dgt})$	100 $\mu$ V/ $\mu$ A
	4000 $\mu$ A	1 $\mu$ A		1.2 mV/mA
	40 mA	0,01 mA		
	400 mA	0.1 mA		
	4 A	0.001 A	$\pm(1.0\% + 5 \text{ dig.})$	75 mV/A
	10 A	0.01 A		
AC A (45 Hz to 1 KHz)	400 $\mu$ A	0.1 $\mu$ A	$\pm(1.0\% + 5 \text{ dig.})$	100 $\mu$ V/mA
	4000 $\mu$ A	1 $\mu$ A		1.2 mV/mA
	40 mA	0.01 mA		
	400 mA	0.1 mA		
	4 A	0.001 A	$\pm(1.0\% + 5 \text{ dig.})$	75 mV/A
	10 A	0.01 A		

## Resistance measurement and diode test

Function	Range	Resolution	Accuracy	Input impedance
Ohms	400 $\Omega$	0,1 $\Omega$	$\pm(0.5\% + 10 \text{ dig.})$	< 1.2 V
	4 K $\Omega$	1 $\Omega$	$\pm(0.5\% + 3 \text{ dig.})$	
	40 K $\Omega$	10 $\Omega$		
	400 K $\Omega$	0,1 K $\Omega$		
		4 M $\Omega$	1 K $\Omega$	
	40 M $\Omega$	10 K $\Omega$		
Continuity test	Test voltage: < 1.2 V			
Diode test	Test voltage: < 3 V Max. test current: 2.5 mA			

Cycle (%) 0.9 - 99.9% (30 RPM - 19.999 RPM, impulse > 2 $\mu$ s)

Dwell degrees (°) 0.0 - 356.4° (30 RPM - 19.999 RPM, impulse > 2 $\mu$ s)

Impulse 0.002 - 199.9 mS (30 RPM - 19.999 RPM, impulse > 2 $\mu$ s)

Continuity 1.2 V - Diode test max. 2.5 mA - Counter sensitivity 150 mV

1 multimeter MT 09

1 test lead set red/black

1 temperature sensor

1 inductive clamp

Delivery in solid plastic case

STZ 01, STZ 02

041712, 041718



### Clamp-on current probe for testing direct and alternating currents

For testing direct and alternating currents up to a maximum of 400 A, with red/black leads for connection to an MT 09, MT 07 or MT 701 multimeter.

- measuring range 0...40 and
- measuring range 40...400 A
- adapter opening width 52 mm (2 1/4")

STZ 02, equivalent version of STZ 01, but measuring range 1...1000 A.

- 1 clamp-on current probe STZ**
- 1 flexible connecting lead red/black, length 1.60 m (4.6 ft)**

CBB 01

081004\_1



### Interface for testing CAN bus systems

The CAN-Bus-Box CBB 01 is a mobile interface for testing CAN-Bus-Systems. The use of the box allows easy access to all pins of the OBD connector to measure and test the signals by different test devices. Also you can connect a multimeter or an oscilloscope to show CAN high and CAN low signals. At the same time an OBD-terminal can be connected.

Circuit, ground and quality of the CAN-bus-signals can be verified.

- easy access to all pins of the OBD connector
- quick test of wiring and ground circuit
- works without battery or power supply, because power supply via CAN bus
- simultaneous connection of other OBD tools possible
- length of the OBD connector cable: 2.50 m

## Glow plug testers

GKP 05

070607\_1



### Glow plug tester for 4.4 V and 5 V glow plugs

Testing can take place with the glow plug installed. The state of the glow plugs is displayed by two LEDs (green/red).

- visual displays for 'instrument ON', 'low battery'
- glow plug OK' and 'glow plug faulty'
- robust clip connectors for glow plug and earth
- automatic tester cutout
- power supply by 9 V Monobloc battery

- 1 glow plug tester**
- 2 connecting cables each 1.00 m long (3 ft)**

GKP 04.1

070606



### Glow plug tester for 12 volt heater plugs with 3 diodes

The test may be executed with glow plugs mounted. The tester should be connected to the vehicle battery by means of the red (+) and black (-) battery terminals. The auxiliary terminal should be connected to the glow plug undergoing testing. After pressing the START button the test result is shown within 15 seconds.

### The condition of the glow plug is indicated by diodes

- correct connection (green)
- good (green)
- defective (red)

Due to the integral automatic circuit breaker a change of the vehicles' fuses is not necessary.

- 1 glow plug tester**
- 1 power supply cable with clamps, length 1.40 m (4 ft)**
- 1 auxiliary clip with cable, length 1.40 m (4 ft)**

## Illumination testers - Trailer testers

ATA 07

080119\_1



### Trailer tester with accumulator for electric simulation of tractors for 12 V

Trailer tester with accumulator for electric simulation of tractors for 12 V, with automatic cut-off after 2 min. out of use, automatic cut-off in case of short circuit. Details accumulator: voltage 12 V, capacity 1.2 Ah.

#### Suitable for use with following plugs:

- 13-pole, 12 V (WeSt)
- 7-pole, 12 V (DIN/ISO 1724)
- 13-pole, 12 V (Multicon)

#### LED-indication for:

- capacity indication when device is switched on
- in case of accu voltage <10.5 V
- current flow
- accu charging
- accu filled

1 trailer tester ATA 07

1 220 V charging lead

Delivery in solid plastic case

AT 09

080121



### Trailer lighting tester for 24 volts, in metal housing

Suitable for use with the following plugs:

- 15-pole, 24 V (ISO 12098 ADR/GGVS)
- 5-pole, 24 V (DIN/ISO 7638, ABS)

Power supply established with battery clamps for two 12 V batteries or 24 V power supply unit (not included in delivery).

#### The following functions can be adjusted and tested with rotary switches:

reversing light, brake lining wear sensor, solenoid valve (ABS), spring-operated brake, tail light right, electronics (ABS), tail light left, data communications warning system (ABS) flasher right, power supply (24V), flasher left, brake lights axle raising system, rear foglamp.

1 trailer lighting tester AT 09

12 V power supply with clamps, length 1.50 m (4.3 ft)

AT 2000

080120



### Multi-purpose trailer lighting tester for 24 volts in metal housing

Special execution.

#### Expanded version of AT 09, suitable for the following plugs:

- 4-pole, 24 V (DIN 72575)
- 7-pole, 24 V (DIN/ISO 1185 N-Type, Euro)
- 7-pole, 24 V (DIN/ISO 3731 S-type)
- 13-pole, 24 V (ISO 12098 ADR/GGVS)
- 15-pole, 24 V (ISO 12098 ADR/GGVS)

The power supply is established with battery clamps for two 12 V batteries or a 24 V power supply unit (not included in delivery).

#### The following functions can be adjusted and tested with rotary switches:

flasher right, flasher left, brake lights, reversing light, tail light right, rear foglamp, tail light left.

1 trailer lighting tester AT 2000

12 V power supply with clamps, length 1.50 m (4.3 ft)



## Illumination testers - Tractor testers

ZWT 01

080203



### Tractor Tester, 7-pole plug, 12 V

For testing the tractor's plug socket. The tester is fitted with load resistors. Vehicles with CAN-bus can also be tested.

- 7-pole, 12 V (DIN/ISO 1724)
- integrated load resistors for flashers and rear foglamp

#### Test functions:

flashers, brake lights, tail lights, rear foglamp.

ZWT 02

080204



### Tractor Tester, 7-pole plug, 24 V

For testing the tractor's plug socket. The tester is fitted with load resistors. Vehicles with CAN-bus can also be tested.

- 7-pole, 24 V (DIN/ISO 1185)
- integrated load resistors for flashers and rear foglamp

#### Test functions:

flashers, brake lights, tail lights, rear foglamp.

ZWT 09

080219



### Tractor unit lighting tester, 24 V, + ABS test function

With integral ABS test function. Impact protected housing with hook, suitable for checking the following electrical sockets:

- 15-pole, 24 V (ISO 12098 and ADR/GGVS)
- 7-pole, 24 V (DIN/ISO 7638) ABS socket

Testing of the individual functions is effected by the lighting-up of the correspondingly marked LED. The tester is fitted with load resistors for the flasher function; as a result, the green indicator lamp in the instrument panel flashes when the flasher switch is operated.

#### 1 tractor lighting tester ZWT 09

1 connecting cable with 15-pole and 5-pole plug, length 2.00 m (6.5 ft)

ZWT 20

080247\_1



### Tractor tester, 13-pole plug, 12 V, 5 m cable

For testing the tractor's plug socket. The tester is fitted with load resistors. LEDs for individual functions and 5 m (16.4 ft) cable provide for use in the workshop and maintenance garage.

- vehicles with CAN-bus can also be tested
- plug 13-pole, 12 V (ISO 11446)
- integrated load resistors for flashers and rear foglamp

#### Test functions:

flashers, brake lights, tail lights, reversing light, rear foglamp.

**Note:** Tractor unit tester with alternative test plug connectors, e.g. 15-pole, 24 V, available on request.

# - 106 - Electrical/Charging System

ZWT 40

080249\_2



## Tractor vehicle tester 12 V, CAN bus capable

For controlling of 13-pole socket of towing vehicle. The individual switches and testing lights such as tail lights, brake lights, indicators, reverse lights and rear fog lights are integrated in the test case and can be individually switched on or off.

- testing can be carried out by one person from the driver's seat with a connection cable of length 5,00 m (16.4 ft).
- 13-pole plug 12 V (ISO 11446)
- function test and failure test for individual incandescent lamps
- power supply by continuous positive and/or charging line

ZWT 50

080250\_1



## Tractor tester, 13-pin socket, 12 V, CAN bus capable

For testing 7 and 13-pin sockets on the towing vehicle. The 5.00 m long connecting cable allows testing to be performed by a person sitting in the driver's seat.

### Features:

- 13-pin socket, 12 VDC
- testing can be carried out by one person from the driver's seat
- connection cable of length 5,00 m (16.4 ft).

### Test functions:

- flashers
- brake lights
- tail lights
- reversing light
- rear foglamp
- 100 % trailer simulation

**1 tester ZWT 50**

**1 extension cable, 5.00 m**

ZWT 2000.1

080501



## Tractor unit lighting tester, for 12 and 24 V

The ZWT 2000 series permits the electrical socket on the tractor unit to be tested. Automatic voltage identification for 12 or 24 V by LED display, impact-protected plastic housing. Connection to the corresponding socket is established by various ZWTA-series adapter cables. A bayonet catch on the tester allows rapid changeover of adapter cables.

To enable testing of the individual functions to be carried out from the driver's seat, a 5.00 m (16.4 ft) extension cable VK 2000 can be connected between the tester and the adapter. Approved for safety testing.

Tractor unit lighting tester, for 12 and 24 V.

**1 ZWT 2000 basic tester**

**3 ZWTA 01, 02, 03 test adapters (see table)**

**1 VK 2000 extension cable, 5.00 m (16.4 ft) long**

ZWT 2009.1

080508



## Tractor unit lighting tester for 12 and 24 V with additional testing facility for ABS socket

The ZWT 2000 series permits the electrical socket on the tractor unit to be tested. Automatic voltage identification for 12 or 24 V by LED display, impact-protected plastic housing. Connection to the corresponding socket is established by various ZWTA-series adapter cables. A bayonet catch on the tester allows rapid changeover of adapter cables.

To enable testing of the individual functions to be carried out from the driver's seat, a 5.00 m (16.4 ft) extension cable VK 2000 can be connected between the tester and the adapter. Approved for safety testing.

Tractor unit lighting tester for 12 and 24 V with additional testing facility for ABS socket.

**1 ZWT 2009 basic tester**

**1 ZWTA 05 test adapter, 5-pole, 24 V, ABS**

Lots of testing adapters ZWTA are available optionally.  
Cable length 0,60 m, see table.

Code	Ref. No.	Description
ZWT 2000	080502_1	Basic tester for ZWT 2000.1 with bayonet catch for test adapter connection
ZWT 2009	080502_2	Basic tester for ZWT 2009.1 with bayonet catch for test adapter and additional connection for ABS testing
ZWTA 01	080503	Test adapter with 3 plugs, 4-pole, 24 V (DIN 72575); 7-pole, 24 V (DIN/ISO)
ZWTA 02	080504	Test adapter with 2 plugs, 7-pole, 12 V, (DIN/ISO 1724); 13-pole, 12 V (ISO 114 46)
ZWTA 03	080505	Test adapter with 2 plugs, 13-pole, 24 V (ADR/GGVS Hazardous goods)
ZWTA 04	080506	Test adapter with 1 plug, 13-pole, 24 V (tanker vehicle plug)
ZWTA 05	080509	Test adapter with 1 plug, 5-pole, 24 V (ABS)
ZWTA 06	080510	Test adapter with 2 plugs, 13-pole, 24 V (tanker vehicle plug); 15-pole, 24 V (ISO 12098)
ZWTA 07	080514	Test adapter with 1 plug, 12-pole (NATO)
VK 2000	080507	Extension, 5.00 m (16.4 ft) long (cannot used with ZWTA 05)

## Accessories for Illumination testers ZWT

VK 27

080329



### Adapter from 7 pole plug to 13 pole socket

VK 27, adapter from 7 pole, 12 V plug (DIN/ISO 1724) to 13 pole, 12 V socket (ISO 11446).

Delivery in paper box

VK 26

080327



### Adapter from 13 pole plug to 7 pole socket

VK 26, adapter from 13 pole, 12 V plug (ISO 11446) to 7 pole, 12 V socket (DIN/ISO 1724).

Delivery in paper box



Angle measurement unit for aero wiper testing and adjusting tool

Digital tire inflator HRVD 01.



Aero wiper adjusting tool.



## Safety

- Aero wiper testing and adjusting
- Electronic force measurement
- Measurement of the thickness of surface coatings
- Tire pressure checking and filling

SAFETY



QR-code on the topic of  
Safety





## Aero wipers

The new generation of bracketless windscreen wipers made by Bosch, Valeo, SWF etc. and known under the brandnames 'Aerotwin', 'Flat blade' etc. require new testing and adjusting tools. The wiper blade holders on the wiper arm must be presented to the windscreen or rear window at a specific angle.

If the wiper blades rattle/rub/squeal, if the wiping is inefficient or uneven and after the windscreen/rear window has been replaced, it is essential to check the angle because there is a high probability that the angle will have changed.

### Checking the angle:

Remove the wiper blade. Connect the adapter (angle measuring instrument). By using the appropriate adapter, it is possible to achieve a precise connection between the wiper blade holder and the angle measuring instrument. Holders are available for every type of wiper arm (Bosch, Valeo, SWF, etc.).

### Angle adjusting tools:

The special feature of the new wiper systems is that no force may be applied through the wiperblade holder, to adjust the angle. Depending on the type of wiper arm, the adjusting tools invariably consist of two similar parts (adjusting tool and counter holder). The measurement and adjustment of the angle can take place simultaneously. Adjusting tools are available for all types of wiper arm.

### Pressure applied by the wiper arm:

The pressure applied by the wiper arm to the windscreen/rear window is approx. 10 Newtons, tolerance approx.  $\pm 1$  N. If the pressure applied by the spring is less than 10 N, it is impossible, as a matter of logic, to achieve the optimum wiping effect, the spring or complete wiper arm must be replaced.

You can find the list of the available adapters at our website, at Service, Downloads, in "Adapter list for Adjusting tool for Aero wipers (AWPE)"



For this purpose you also can scan the QR-code.

## AWPE 03

180103\_1



### Aero wiper testing and adjusting tool, basic equipment

Aero wiper testing and adjusting tool; the delivery specification comprises basic equipment, but this can be extended with additional adapters or adjusting tools. For description, see introductory text.

**1 angle measuring unit (AWPE-WE)**

**1 wiper blade jig (AWPEA-B)**

**2 adjusting tools (AWPE-Z4)**

**Delivery in solid plastic case**

## AWPE 04

180104\_1



### Aero wiper testing and adjusting tool, augmented version

Aero wiper testing and adjusting tool. Augmented version of the AWPE 03.

Specification as above plus an additional wiper blade jig (AWPEA-C) and three pairs of lever jigs with M5, M6 and M8 threads to secure the various wiper blade adapters.

**1 angle measuring unit (AWPE-WE)**

**1 wiper blade jig (AWPEA-B)**

**1 wiper blade jig (AWPEA-C)**

**2 adjusting tools (AWPEE-Z4)**

**2 lever jigs (AWPE-M5)**

**2 lever jigs (AWPE M6)**

**2 lever jigs (AWPE-M8)**

**Delivery in solid plastic case**

## Electronic force measurement

LDM 01

071601\_1



### Test instrument for the non destructive measurement of the thickness of surface coatings on iron and non-ferrous metals

Test instrument for the non destructive measurement of the thickness of surface coatings on iron and non-ferrous metals. The ergonomically designed coating tester with integral measuring probe gives rapid, precise test results with a high degree of accuracy. The display consists of a 4-place LCD module.

- power supply by 4 x 1.5 V-batteries.
- supplied in a case with directions for use and calibrating standards
- wireless design permits convenient, single handed operation
- suitable for materials such as iron, steel, aluminium, copper and brass
- automatic material identification (F/NF)
- measuring range from 0 to 1250  $\mu\text{m}$
- measuring accuracy  $\pm 2\%$
- wear-free spring suspended measuring head
- automatic cutout

**Delivery in solid plastic case**

DKM 1500

071501



### Electronic force tester to check electric windows, electric sunroofs and liftdoors

Electronic force tester to check electric windows, electric sunroofs and liftdoors. The electronic force tester is an accurate instrument and provides reproducible results. Due to the construction of the sensor, the upper and lower side of the sensor have the same function, i.e. no matter how the sensor is used, the results are identical.

#### Application:

- checking the stop function of electric windows and sunroofs
- checking the stop function of liftdoors
- measuring the maximum pressure
- range 0...1500 Newton
- power supply by a 9 V battery
- 10 results/sec., accuracy  $\pm 1\%$
- automatic memory of the maximum value
- dimensions of the sensor (L /W/H) 70 x 50 x 27 mm
- further ranges on request.

**Delivery in solid plastic case**

DKM 15

071502



### Electronic force tester to check windscreen wipers

Electronic force tester to check windscreen wipers. Due to the construction of the sensor, the upper and lower side of the sensor have the same function, i.e. no matter how the sensor is used, the results are identical.

- range 0...15 Newton
- power supply by a 9 V battery
- 10 results/sec., accuracy  $\pm 1\%$
- automatic memory of the maximum value
- dimensions of the sensor (L /W/H) 40 x 12 x 15 mm
- further ranges on request

Delivery in solid plastic case

DKM 45

071503\_1

### Electronic force tester DKM 45

Electronic force tester, equivalent version of DKM 15, but range 0...45 Newton.

Delivery in solid plastic case

WKZ\_DKM 15

190102

### Factory calibration certificate

Calibration certificate for DKM 15 (Electronic force tester to check windscreen wipers).

WKZ\_DMK 45

190111

### Factory calibration certificate

Calibration certificate for DKM 45 (Electronic force tester to check windscreen wipers).

WKZ\_DMK 1500

190101

### Factory calibration certificate

Calibration certificate for DKM 1500 (Electronic force tester to check windscreen wipers).

## Tire pressure - checking and filling

### Plug versions



### Different plug versions for Hand tire inflators

**Note: If you exchange a calibrated manometer an official calibration is necessary.**

No	Plug version	Code
1	Filling station plug	HR T, HRD T
2	Lever plug	HRH, HRDH
3	Valve plug	HRV, HRDV

RDM 01

130452\_1



### Tire pressure gauge with valve plug

- Compact and handy tyre pressure gauge
- DS 63 mm with protective rubber cap
- Range 0...6 bar, with valve plug

Connection with valve plug. The device is calibratable.

Delivery in paper box



**HRxD 08.2** -



### Digital tire inflator

~~officially calibrated~~

Digital tire inflator for high quality expectations.  
Operation with workshop pressure 6 to 12 bar.  
Pressure measurement 0 to 8 bar (= possible outlet pressure).

Three different models available:

No	Version	Code	Ref No.
1	Filling station plug	HRTD 08.2	130481_1
2	Lever plug	HRHD 08.2	130480_1
3	Valve plug	HRVD 08.2	130482_1

**HRV 08.2AL**

**130474\_1**



### High quality hand tire inflator with valve plug

~~officially calibrated, with calibration mark~~

High quality hand tire inflator with valve plug, aluminium version. Pressure gauge DS 80 with rubber protection, dual scale 0...10 bar/145 psi. Ergonomic handle for connection to workshop compressed air system, with 2-stage inflation/deflation lever.

Completed with hook for use in the Workshop.

**HRx 08.2** -



### Hand tire inflator with ergonomic handle

For connection to workshop compressed air system, with 2-stage inflation/deflation lever.

Three different models available:

No	Version	Code	Ref No.
1	with filling station plug	HRT 08.2	130443
2	with lever plug	HRH 08.2	130442
3	with valve plug	HRV 08.2	130448

Working pressure between 6 and 12 bar. Clearly legible pressure on DS 80 mm (3 1/4") precision pressure gauge with robust rubber protective cap. Double scale, 0...10 bar/145 psi.

**HRx 01** -



### Hand tire inflator with pistol handle

For the connection to compressed air.

Three different models available:

No	Version	Code	Ref No.
1	with filling station plug	HRT 01	130401
2	with lever plug	HRH 01	130402
3	with valve plug	HRV 01	130403

High quality gauge with protective rubber cap DS 63 mm (2 1/2") with dual scale 0...10 bar/145 psi.

**Delivery in paper box**

HV 90.2

060107\_2



## Pressure and vacuum pump for the testing of low-pressure switches

Pressure and vacuum pump for the testing of low-pressure switches; rubber protected DS 63 mm (2 1/2") pressure gauge, double scale -1...+3 bar / 45 psi with fine divisions. Connector with 7/16"-20UNF male thread (for other adapters, see HVA-series)

Applications as listed for HV 90.3.

Adapterlist: HV 90.2 and HV 90.3

Code	Connection
HVA 01	Thread 3/8-24UNF (Inner thread)
HVA 02	Thread 3/8-24UNF (outer thread)
HVA 03	Thread M 12x1,5 (outer thread)
HVA 04	Thread M 12x1,5 (outer thread, sealing cone)
HVA 05	Thread M 12x1,5 (outer thread, sealing cone, GL 5 mm)
HVA 06	Thread M10x1 (outer thread)
HVA 07	Thread 7/16-20UNF (outer thread, sealing cone)

HV 90.3

060110\_1



## Pressure pump with rotary spindle and drain valve, for testing of medium and high pressure switches

With rubber protected DS 63 mm (2 1/2") pressure gauge, double scale 0...40 bar / 580 psi with fine divisions. Connector with 7/16"-20UNF male thread (for other adapters, see HVA-series).

### Applications medium and high pressure switches in

- refrigeration and air conditioning systems
- pneumatic brake systems (transport vehicles)
- oil pressure switches

### Testing capabilities

- determination of trip settings
- determination of on/off trip settings or switching differentials





Leak test at the exhaust system with the ADP 01.

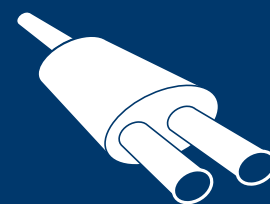
\*AdBlue® is a registered Trade Mark of VDA, Verband der Deutschen Automobilindustrie e.V.



## Exhaust System

- Service equipment for SCR systems
- Tightness of SCR-system
- Diagnosis, flushing, cleaning of DENOX-modules
- Filler unit to fill SCR systems
- Vacuum box for evacuation of the SCR tank
- Device to measure the operating pressure of SCR-systems
- Mini test bench for SCR injectors
- Test device for engine's turbo loader
- Air disturbance simulator
- Leakage test exhaust system

### EXHAUST SYSTEM



QR-code on the topic of  
Exhaust System



## Service equipment for SCR systems

\*Notes on AdBlue® operating additive (urea-water-solution):  
AdBlue® is a registered Trade Mark of VDA, Verband der Deutschen Automobilindustrie e.V.

**RFM 03\_%AB**

**110306\_25**



### Refractometer for testing the Urea concentration in AdBlue®\* operating additive

Test instrument recommended by Daimler AG.

Refractometer for testing the Urea concentration to evaluate the quality of the operating additive AdBlue®\*. Prolonged periods in storage will cause a creeping decomposition of AdBlue®\* operating additive. On the delivery of new AdBlue®\* operating additive containers (quality as supplied) during storage on one's site in customers' vehicles.

**AEKP 01**

**061202\_1**



### Sampling and concentration test kit for AdBlue®\* operating additive

With the AEKP 01, specimens of AdBlue®\* can be extracted from the tank and evaluated.

Evaluation options:

- refractometer for AdBlue®\* operating additive concentration (f.descrip. see RFM 03\_%AB)
- delivery rate of the SCR pump (only with the support of the vehicle's software)
- determination of the injected volume of AdBlue®\* operating additive (only with the support of the vehicle's own Software)

**1 RFM 03 refractometer**

**10 pipettes**

**1 extractor for specimens with suction ball**

**1 measuring cylinder with scale, 500 ml**

**1 narrow-necked PE bottle, 1000 ml capacity**

**1 silicone hose, Ø 9 mm, length 5.00 m**

**Delivery in solid plastic case**

**AEKP 06**

**061207\_1**



### Tightness of SCR-system

The Leitenberger test device AEKP 06 was designed to detect and localize leaks in SCR-systems. With the test device AEKP 06 an empty SCR-system can be tightness tested.

The test pressure is fixed according to the customers requirements – so the operator cannot adjust the test pressure accidentally to high in order to avoid any damage of the SCR-System. The test pressure is induced via the regular filling neck and is pressurizing the whole SCR system. Operated with workshop pressure. Results can be obtained in a very short time.

**AEKP 08\_LR**

**061209\_2**



### Diagnosis, flushing, cleaning of DENOX-modules (also referred DeNOx)

AEKP 08\_LR is offering various diagnosis and flushing/cleaning possibilities of the DENOX-modules. DENOX-modules are used in conjunction with larger engines for exhaust after treatment (e.g. in construction, forestry and agricultural equipment).

**Delivery in solid plastic case**

ABE 02\_MB

061201\_4



## Filler unit to fill SCR systems with AdBlue®\* operating additive

Filler unit recommended by Daimler AG.

Filler unit to fill SCR systems with AdBlue®\* operating additive. To be used, especially, for all Mercedes-Benz cars with an SCR system. Not to be used for commercial vehicles, e.g. Sprinters or transport vehicles. It is possible to use the filler unit directly with the original AdBlue®\* operating additive container A 004 989 04 20. This saves transferring the fluid from one container to another and eliminates the possibility of contaminating the AdBlue®\* operating additive. The filler is designed to function without compressed air.

- easy to use
- can be used anywhere
- integrated device to prevent overfilling the SCR system
- low cost, entry level maintenance of SCR systems

**1 filler unit, including container connection**

**1 tank filling socket for MB vehicles**

**1 plastic container, capacity 10 litres (for emergency use, empty)**

**1 transparent filler hose, length 1.60 m**

**1 transparent venting hose, length 2.00 m**

ABE 03\_LR

061201\_5



## Filler unit to fill SCR systems with gas-displacement techniques

Filler unit, to be used, especially to fill SCR systems with AdBlue®\* operating additive, incl. 10 l container.

- filling with gas-displacement techniques
- for mobile use (independent of electrical power supply and compressed air)
- geschlossenes System verhindert Überfüllung
- integrated device to prevent overfilling the SCR system
- low cost, entry level maintenance of SCR systems
- no unpleasant smell for the personnel

**1 filler unit, including container connection**

**1 plastic container, capacity 10 litres (for emergency use, empty)**

**1 transparent filler hose, length 1.60 m**

**1 transparent venting hose, length 2.00 m**

ABE 04\_LR

061208\_1



## Inflating hose for 10 l container

To fill SCR systems with AdBlue®\* operating additive. To be used as adapter between container and tank. For transferring the fluid from the container into the tank. Eliminates the possibility of contaminating the environment with AdBlue®\* operating additive.

VB 01.1\_AB

100801\_5



## Vacuum box for evacuation of the SCR tank

The VB 01.1\_AB vacuum box is suitable to extract AdBlue®\* operating additive out of the SCR tank. The unit can be used mobile and stationary. It has a capacity of 11 l. For a detailed description, see section BRAKE SYSTEM, page 75, VB 01.

### Applications:

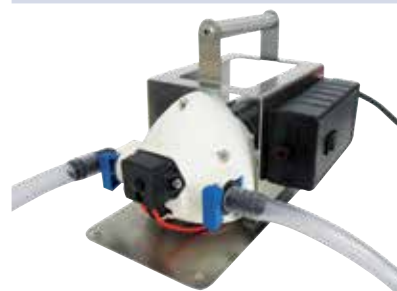
- before replacing damaged components, e.g. the SCR pump
- to change the AdBlue®\* operating additive

**1 vacuum box with venturi nozzle**

**1 transparent suction hose with connections, length 2.50 m (8.3 ft) supplied in a carton pack**

EAP 10\_12VDC

061301\_1



## Rugged suction pump, with stainless-steel housing, 12 VDC

Rugged suction pump, 12 VDC, with stainless-steel housing. Designed especially for use with operating materials in SCR systems (urea-water solution). Design with

# - 120 - Exhaust System

ON/OFF switch and priming protection. Power supply with either plug for cigarette lighter or battery terminals (motor vehicle).

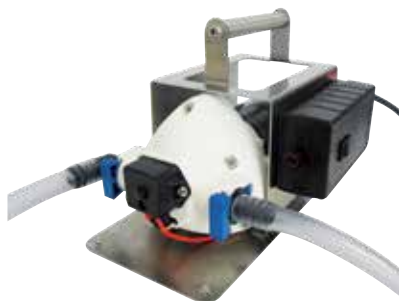
- feed rate 10 l/min.
- sturdy stainless-steel housing
- self-priming
- easy to use
- quiet operation

Caution: Cannot be used for gasoline and highly flammable media!

- 1 EAP 10\_12 suction pump**
- 1 suction hose, length 1.00 m (3.3 ft)**
- 1 outlet hose, length 2.00 m (6.6 ft)**
- 1 power supply cable with plug and battery clamps, length 3.00 m (10 ft.)**

**EAP 10\_24VDC**

**061302\_1**



**Rugged suction pump, with stainless-steel housing, 24 VDC**

Same construction and function as EAP 10\_12 but with power supply 24 VDC.

EAP 10\_24 suction pump

- 1 suction hose, length 1.00 m (3.3 ft)**
- 1 outlet hose, length 2.00 m (6.6 ft)**
- 1 power supply cable with plug and battery clamps, length 3.00 m (10 ft.)**
- Delivery in solid plastic case**

**VBA 04**

**100814\_1**



## **Universal adapter for emptying and lowering the level of SCR tank**

Universal adapter for narrow cross-sections.

Universal adapter for emptying and lowering the level of SCR tank with narrow cross-sections. Can only be used in conjunction with the vacuum box VB 01\_AB. Accessorie of VB 01\_AB.

AdBlue® resistant version with hose 2.50 m (8.3 ft).

**ET 888**

**111863\_1**



## **SCR-adapter, refuel connector, intermediate piece**

Accessory for ABE 03\_LR, ABE 03\_LR, ABE 02\_MB, AEKP 06.

Connector for ABE 03\_LR, if opening is in fuel tank neck. Intermediate piece. In case that the filling opening is located in the fuel tank neck, remove the 2 hoses of the ABE 03\_LR from the tank side adapter and connect them with the ET 888.

**FP 07\_AB**

**041228\_1**



## **Device to measure the operating pressure and tightness of SCR-systems**

With push-in fitting for the connection to SCR-system.

- measuring range -1...+9 bar
- compound gauge DS 63 mm (2 1/2")

**FPD 07\_AB**

-



## **Device to measure the operating pressure and tightness of SCR-systems, with digital gauge**

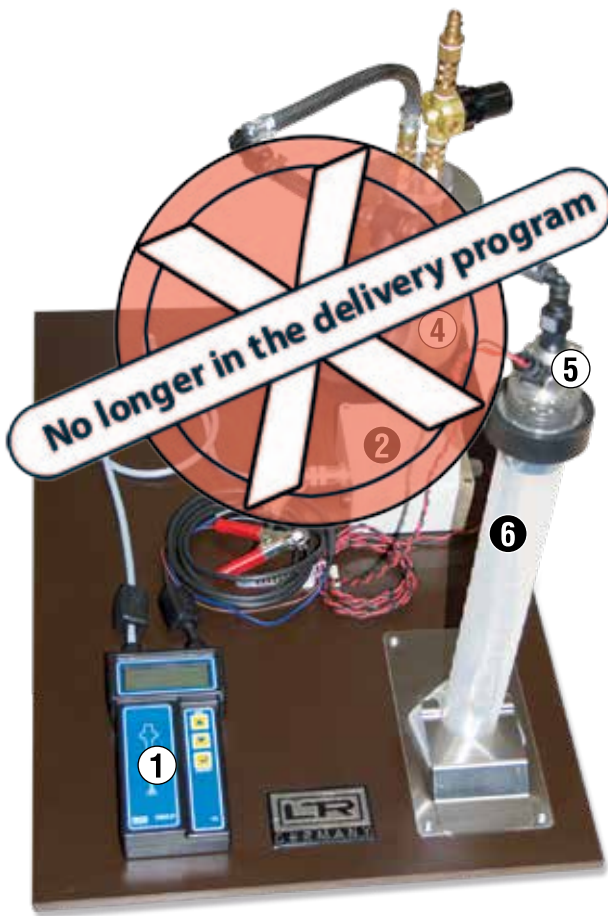
With digital gauge for higher measurement accuracy and easier read out. With push-in fitting for the connection to SCR-system.

- measuring range -1...+16 bar
- digital gauge with rubber protective cap



MP\_SCR 01

041253\_1



## Mini test bench for SCR injectors

To test SCR metering valves (passenger cars).

### With this set-up the following tests can be run:

- single shot test
- inspection, if all injection drillings are open
- “10 minute test”: injection volume within 10 minutes under a fixed program

No	Code	Description
1	CREIS 01_SCR	electronic injection controller, 12 VDC
2	CREL 01_SCR	electronic power section
3	FP 07_AB	pressure tester
4	Reservoir 1 L	water or urea-water resolution, incl. pressure regulator
5	SCR-metering valve	(test specimen) NOT included
6	Measuring beaker	

To operate the mini test bench, a 12 VDC battery is required, as well as compressed air. All components are fitted on an urea-resistant panel.

Further applications on request.

**\*Notes on AdBlue® operating additive (urea-water-solution):**  
AdBlue® is a registered Trade Mark of VDA, Verband der Deutschen Automobil-industrie e.V.

## Test tools for charge air systems

TDU 04

040405



### To test pressure and vacuum of the engine's turbo loader

- high quality compound gauge DS 100 mm (4")
- range -1...+3 bar
- with robust protective rubber cap and hook
- high resolution

Available with an ISO certificate of calibration (at extra charge).

**1 compound gauge with hook**

**1 fuel resistant hose 3.00 m (10 ft) long incl. T-piece**

**1 hose 0.30 m (12 in.) long**

## Leakage test exhaust system

The lambda probe is an important sensor for measurement of residual oxygen concentration in SCR systems. In the event of a leak, fresh air gains access to the SCR system, causing the lambda probe to detect an excessively high concentration of oxygen. The engine management system takes suitable action, but this has no effect, as the unused oxygen in the exhaust gas does not originate from the combustion process.

SV 01

130607\_1



### Air disturbance simulator

A part of the exhaust gas test - the circuit test - is effected to guarantee that the Lambda probe is working correctly.

By means of the adjustable disturbance air valve SV 01, a precisely measured quantity of disturbance air is introduced to the engine at a defined spot.

The disturbance air with the SV 01 can be introduced from 0.0 to 2.3 mm.

# - 122 - Exhaust System

AGD 01

130605



## Leakage test exhaust system

Overheating and dirt of a catalytic converter has negative influence on the emission of exhaust gases. The testing of the exhaust gas pressure allows a quick catalyst diagnosis. The connection is at the exhaust gas system between engine and catalyst by means of a thread connector instead of the Lambda probe. The connector can be coupled with the pressure hose.

Gauge with protective rubber cap, DS 63 mm (2 1/2"), range -1...+3 bar, equipped with a red/green marked scale. When the indication remains within the green area, the catalytic converter is in order; however, if the catalyst is defective or clogged, the indication is in the red area.

**1 compound gauge, 63 mm, -1...+3 bar**

**1 pressure hose 3.00 m (10 ft) long**

**1 connector M 18x1.5 (ANK 40, male)**

**Delivery in solid plastic case**

ADP 01

130608\_1



## Leakage test exhaust system

The leak test is carried out when the engine is cold. The test device works using workshop compressed air and an integrated pressure regulator. The display is provided by a pressure gauge with a measurement range of 0 to 600 mbar.

A pressure drop is indicative of possible leaks in the SCR system. The leak is localized acoustically by listening for the noise of escaping air, or with the aid of a leak spray.

**1 tester DPL 01**

**1 test and sealing adapter with hand wheel UA 4AG**

**1 test seal with hand wheel UA 4VK**

**1 test hose with quick-release coupling**

**Delivery in solid plastic case**

## NOTES

Two columns of horizontal blue lines for writing notes.



Cleaning the air intake valve with the device EVR 01.

Blow-by-gases measurement with the DFL.



Tightness test of the cold air intake system with the MLPS.



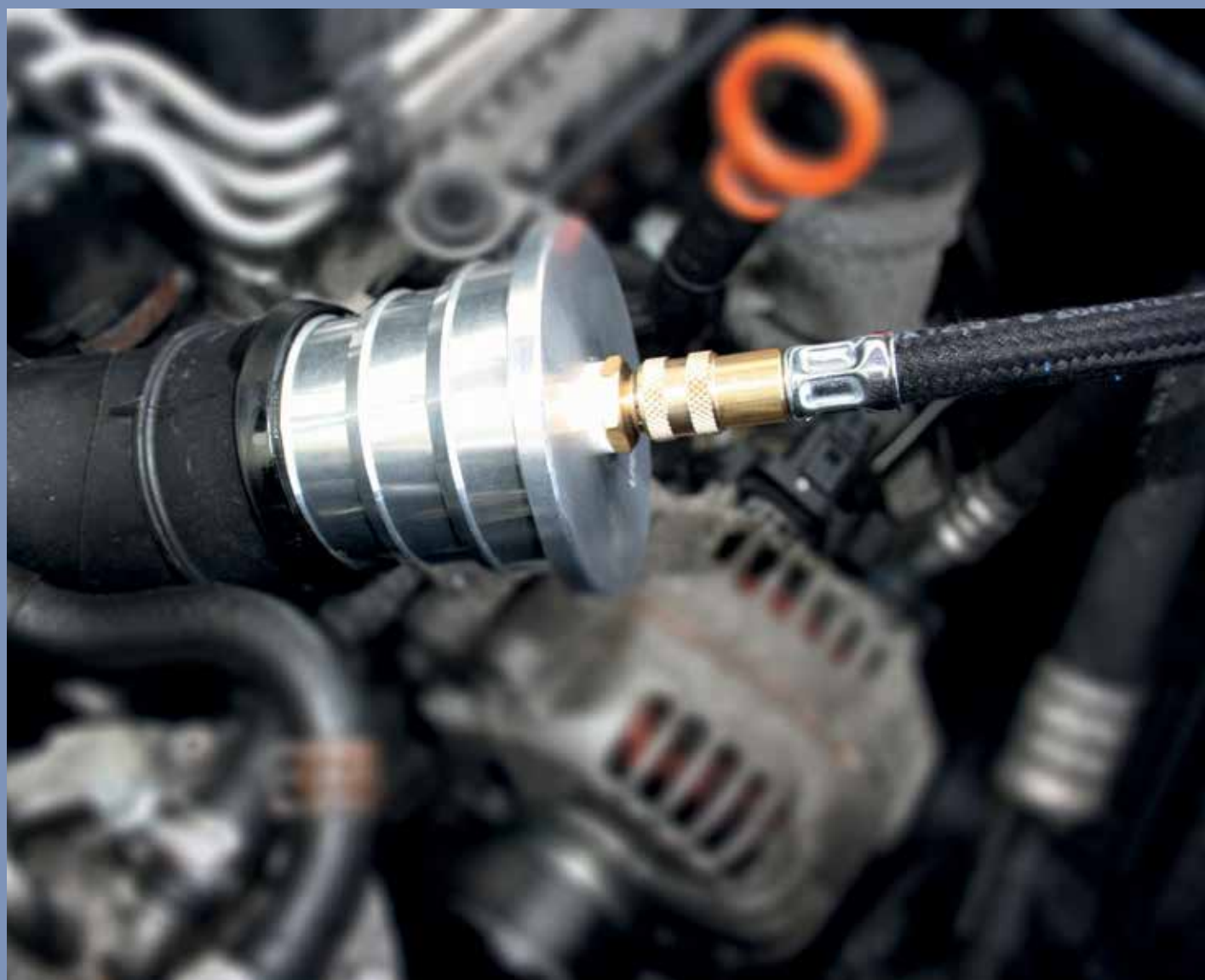
## Cold air intake system

- Leakage test fresh air intake
- Leak testing of charge air systems
- Cleaning tool exhaust gas counter-pressure sensor
- Blow-by-gases measurement device
- Intake System Cleaner

### COLD AIR INTAKE SYSTEM



QR-code on the topic of  
Cold air intake system



# - 126 - Cold air intake system

## Leakage test fresh air intake

LPS 01

061110\_1



### Leak testing of charge air systems

To check the charge air system and its individual components for leaks. Suitable for engines of the VW group.

**1 manifold (adjustable pressure)**

**1 filling hose**

**9 adapters**

**3 hose fittings with clamps**

**Delivery in solid plastic case**

LPS 01.2

061110\_2



### Leak testing of charge air systems

To check the charge air system and its individual components for leaks. Suitable for engines of the VW group. Same function and design as LPS 01, but manifold with fixed measuring pressure (1 bar).

**1 manifold**

**1 filling hose**

**9 adapters**

**3 hose fittings with clamps**

**Delivery in solid plastic case**

MLPS 03

061114\_1



### Leak testing of charge air systems

To check the charge air system and its individual components for leaks. Time saving and proper work, locate leaks very fast. Safety valve prevents overpressure, maintenance free.

- universal use
- display 0...2.5 bar
- pressure relief valve max. 1 bar output
- hose length 0.4 m

**1 MLPS pressure regulator**

**1 filling hose**

**1 adapter (Ø in mm = 50, 60, 70)**

**1 closing plug (Ø in mm = 50, 60, 70)**

**1 operating manual**

**Delivery in solid plastic case**

MLPS 04

061115\_1



### Leak testing of charge air systems

To check the charge air system and its individual components for leaks. Time saving and proper work, locate leaks very fast. Safety valve prevents overpressure, maintenance free.

- universal use
- display 0...2.5 bar
- pressure relief valve max. 1 bar output
- hose length 0.4 m

**1 MLPS pressure regulator**

**1 filling hose**

**3 adapter (Ø in mm = 36, 41, 47, 52, 57, 63, 68, 78, 83, 88)**

**3 closing plug (Ø in mm = 36, 41, 47, 52, 57, 63, 68, 78, 83, 88)**

**1 operating manual**

**Delivery in solid plastic case**

MLPS 06

061117\_1



## Leak testing of charge air systems

To check the charge air system and its individual components for leaks. Time saving and proper work, locate leaks very fast. Safety valve prevents overpressure, maintenance free.

- universal use
- display 0...2.5 bar
- pressure relief valve max. 1 bar output
- hose length 0.4 m

**1 MLPS pressure regulator**  
**1 filling hose**  
**6 adapters**  
**6 closing plugs**  
**Delivery in solid plastic case**

## Cleaning, Indication

AGS 01

400005\_2



## Cleaning tool exhaust gas counter-pressure sensor

Removes deposited carbonisations without damages. For the flawless function of the exhaust gas counter-pressure sensor. For common rail engines of Mercedes-Benz automobiles models OM 651 and OM 646.

DFL 10-150\_LR

061113\_1



## Blow-by-gases measurement device

To measure Blow-By gases. Blow-By gases (also well known as leakage gases) are an indicator of the wear conditions of an engine. This gases can escape on leaking piston rings, valve guides or turbocharger bearings. Blow-By gases are measured in a realistic scenario.

- measurement range: 10 – 150 l/min
- high repeatability
- quick measurement results

DFL 20-220\_LR

061118\_1



## Blow-by-gases measurement device

To measure Blow-By gases. Blow-By gases (also well known as leakage gases) are an indicator of the wear conditions of an engine. This gases can escape on leaking piston rings, valve guides or turbocharger bearings. Blow-By gases are measured in a realistic scenario.

- measurement range: 20 – 220 l/min
- high repeatability
- quick measurement results

EVR 01

041809\_1



## Intake System Cleaner

**A cleaning process is recommended with every engine-oil change.**

EVR 01 is powered by 12 VDC. The special cleaning liquid (suitable for Petrol and Diesel-engines) is injected into the air intake to be cleaned by an implemented pump. The special nozzle/injector makes sure the cleaning liquid is injected/sprayed with ca. 3 bar. This guarantees the best possible cleaning results at a stationary vehicle with an engine at idle speed.

Via a pushbutton the injection-process is controlled (injected volume of cleaner). Undesired residues on the intake valve and intake channel are resolved and removed. After a successful removal of these residues the engine will run (again) smoothly and powerfully and its exhaust gas values will be in the expected range

More informations: See topic Engines, page 26.



2 way manifold test kit for service and diagnosis of the air-conditioning system.

Leak detection of the air-conditioning system with the ELS 04.



Leak test of the air-conditioning system with the KLDS 01.

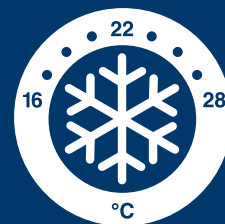




## Air conditioning

- Tightness Test System for Air Conditioning Systems
- Electronic Leak Detector
- 2 way manifold test kit
- Barrel suction pump

AIR CONDITIONING



QR-code on the topic of  
Air conditioning



# - 130 - Air conditioning

KLDS 01

060050\_1



Also suitable for holding 50 l gas bottles.



R744



R1234yf



R134a

## Tightness Test System for Air Conditioning Systems on cart, usable worldwide

KLDS 01 is designed to run out simple and safe tightness tests of any mobile AC-system before the AC-system is charged. It is suitable for refrigerants R744 (CO<sub>2</sub>), R1234yf and R134a.

### Tightness-tests, using any contrast agents are NO longer permitted.!

KLDS 01 is introducing forming gas (N<sub>95</sub>/H<sub>5</sub>) into the AC-system, using a high performance pressure regulator. A pressure drop and thus a leakage can be detected very simple and fast. The very practical cart allows the storage of all 6 testing hoses with 3 m each, accessories, removed parts and tools. The cart is providing a secure standing and a good maneuverability with its 10L or 50L forming gas containers Certified Pressure Safety Valves guarantee a maximum protection for the AC-system and for the operator during the test procedure. „High end“ components „Made in Germany“ guarantee a safe and long life operation under often harsh workshop conditions.

- tightness test without contrast agent
- suitable for AC-systems R744, R1234yf and R134a
- adjustable testing pressure
- easy and accurate readability of pressure drop
- „high end“ AC-couplers HP and LP for refrigerants R744, R1234yf and 134a
- 3 m filling and test hoses / each
- **mobile cart: suitable for 10 or 50 L containers of forming gas**
- mobile cart: spacious, secure standing and good maneuverability
- mobile cart: 2 swivel wheels with brakes and 2 fixed wheels
- Certified Pressure Safety Valves guarantee maximum protection
- „high end“ components „Made in Germany“

1 KLDS 01 on carriage

1 Adapter for forming gas bottle (10 l)

3 Sets filling and test hoses (2 pcs.), 3,0 m, for refrigerants R744 (CO<sub>2</sub>), R1234yf, R134a

1 Operating manual

ELS 04

030215\_1



## Electronic Leak Detector

We recommend the hydrogen detection kit ELS 04 for leak detection and localization.

- Meets all requirements of W000 588 03 21 00
- easy and accurate leak localization supported by acoustic and optical signals
- long and flexible swan-neck (>500 mm) allows maximum reach
- operated by AA-batteries (not included in the delivery)
- Measurement range: 1 ppm...2.2 Vol.-%

1 ELS 04 incl. 500 mm swan-neck

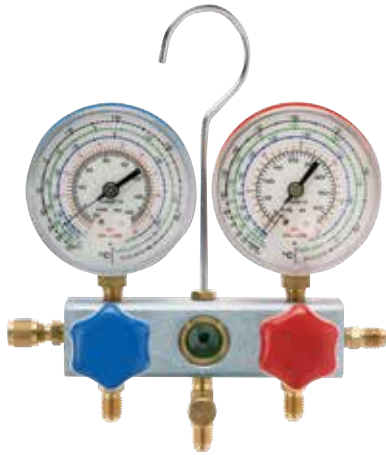
1 operation manual, multilingual, hard copy

Supplied in solid plastic case.

## Service equipment for air conditioning systems

PM 02.1

060619



### 2 way manifold test kit for service and diagnosis on air conditioning and refrigeration systems, including hoses and quick couplings

PM 02.1 - tester kit with 2 way manifold PM 02 for service and diagnosis on air conditioning and refrigeration systems including refrigerant hoses (red/yellow/blue), each 0.90 m long, 1 quick coupling set for refrigerant R 134a.

- pressure units bar / psi
- temperatur unit °C
- coloured scales for refrigerants

Supplied in solid plastic case.

HAP 21C, HAP 21\_MK

060427\_1, 060427\_2



### Barrel suction pump with 1/4 SAE connection with aluminum design

Barrel suction pump with 1/4 SAE connection with aluminum design. Can be used for media such as oil and brake fluid, non-flammable and non-aggressive liquids corrosion-free maximum achievable pressure 30 bar pump volume 400 ml/stroke.

For detailed description see chapter PUMPS, HAP 21C and HAP 21\_MK.

ET 447

121477\_1



### Filling hose set

3 Filling hoses for refrigerant, red, blue, yellow, 0.9 m length, 1/4"-connection.

ET 402

121438



### Set quick couplings for refrigerant R 134a

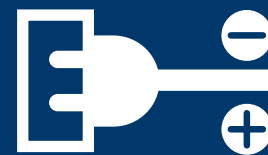
1 set of quick couplings for the 2 way manifold test kit PM 02.1, for connection to the refrigerant filling hoses ET 447, for refrigerant R 134a.



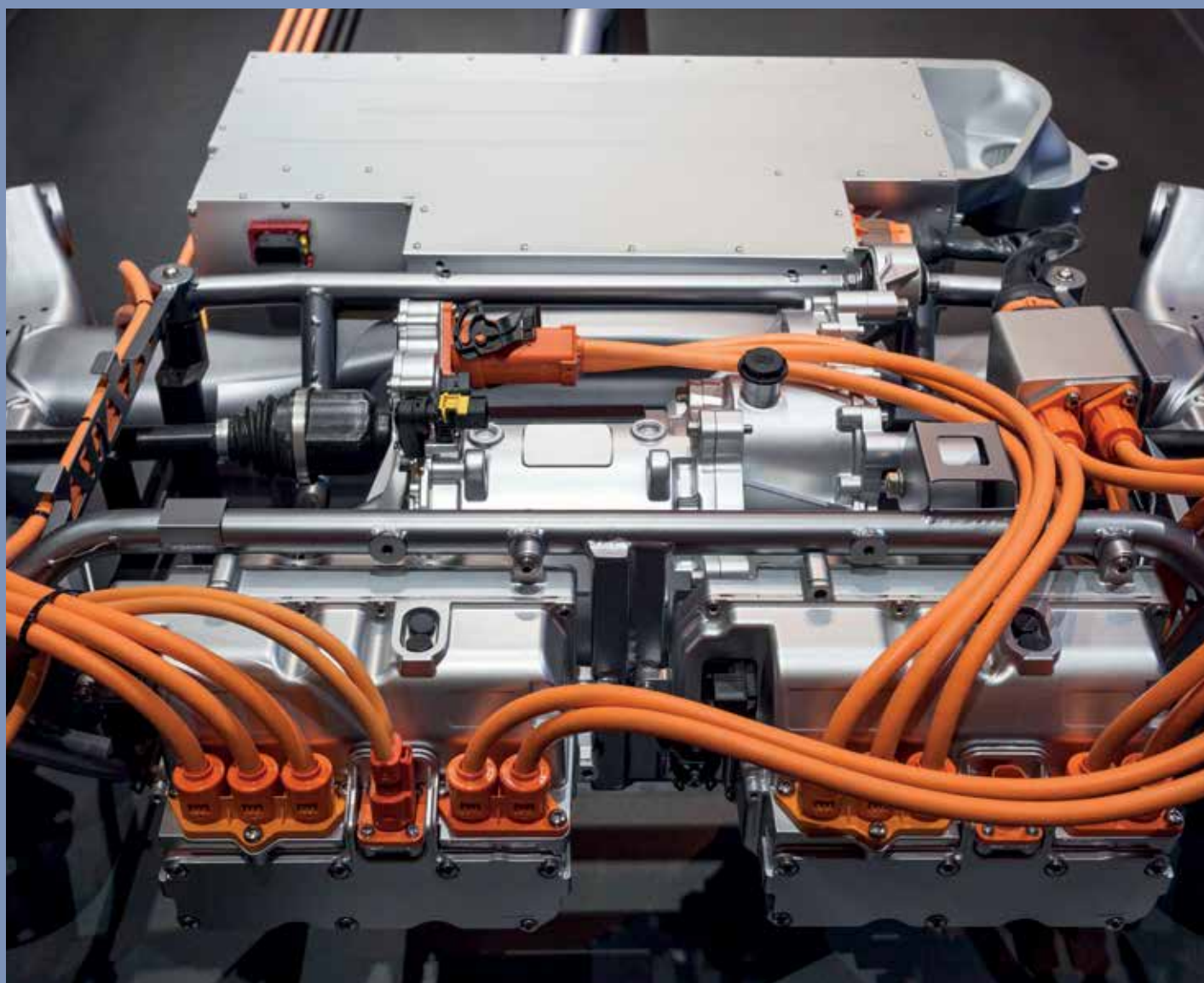
## Alternative Propulsion System

- Leakage tester for battery housings
- Pressure measurement
- Measuring leakage rates
- Tightness test
- Cooling system filler
- Automatic evacuation, filling and testing
- Refractometer

ALTERNATIVE  
PROPULSION  
SYSTEMS



QR-code on the topic of  
Alternative Propulsion System



# - 134 - Alternative Propulsion System



## High voltage technology

Autotestgeräte LEITENBERGER develops and produces devices for the High voltage technology. The market for electric- and hybrid vehicles is increasing rapidly. That leads to new developed tools and measurement technologies, which find their field of application in this special topic, like tools and testing devices for:

- Resistance measurements
- Tightnesstest on battery housings
- Quality of coolant
- Leakage test on battery housings
- Evacuating and filling

## Leakage tester for battery housings

DFG 200

042724\_1



### Flow gauge with digital pressure measurement and display

Digital flow meter for measuring leakage rates in the range 0...200 cm<sup>3</sup>/min in high-density units under test.

#### Examples:

- tightnes test on components
- tightnes test on high voltage batterie cases

Only usable with the LTBG 03/05 (for vacuum and pressure generation)

Measurement range:: 0...200 cm<sup>3</sup>/ min

Pressure max: 1.7 bar

Accuracy: 3 % FS

Power supply: 9V monobloc battery (not part of the delivery)

Without USB interface.

#### Note:

DFG 200 works with the prinzip of mass flow method. This method is a competitive method for pressure loss test / pressure drop method. Both methods complement each other frequently.

#### Delivery in solid plastic case

DFG 200\_230VAC\_S

042724\_2



### Flow gauge with digital pressure measurement and display with USB-interface for data management

For tightnesstests with 230 VDC connection and power supply.

Same function as DFG 200, but with USB interface and user software for visualisation and documentation of measured values.

1 DFG 200\_230VAC\_S

1 power supply 230 VDC

2 Adapter hoses with quick coupling 0,5 m

1 USB cable

1 CD with software

1 manual

Delivery in solid plastic case

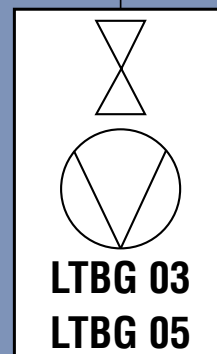
## Mass flow method

### Unit under test

$P_o = -50 \dots 50 \text{ mbar (P}_{rel})$

Mass flow 0...200 cm<sup>3</sup>/min

DFG 200  
flow



closure

Vacuum pump

Venturi nozzle

LTBG 03  
LTBG 05

LTBG 03\_EV

042716\_1



## Tightness test of battery housings

LTBG 03\_EV enables a tightness test with vacuum and/or pressure. It is fitted with special HV-connector\* to induce vacuum or pressure into the battery housing. (\*HV = high voltage)

**Application:** If small leaks/pressure loss has to be detected.

- measuring range: -50 mbar ... +50 mbar
- accuracy: 1.6 % FS
- resolution: 5 mbar (0.005 bar)

Pressure gauge also available in digital version.

**Delivery in solid plastic case**

LTBGD 03\_EV

042716\_2



## Tightness-Testing Kit for Battery Housings - digital version

LTBGD 03\_EV allows a Tightness-Test-Procedure with vacuum or/and Pressure. The device ist equipped with a special HV-Test-Adaptor (HV = High Voltage) in order to induce vacuum or pressure into the battery-housing tested. Vacuum and Pressure generator are powered by workshop pressure

- measurement range: -50 mbar ... +50 mbar [Prel]
  - accuracy: 1.6 % FS
  - resolution: 5 mbar (0,005 bar)
- also available as analog version

**Lieferung im stabilen Kunststoffkoffer**

LTBG 05\_EV

042717\_1



## Tightness test of battery housings with large-volume (more than 5 dm³)

LTBG 05\_EV enables a tightness test with vacuum and/or pressure, even on battery housings with a large volume. It is fitted with special HV-connector\* to induce vacuum or pressure into the battery housing. (\*HV = high voltage)

- measuring range: -50 mbar ... +50 mbar

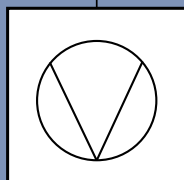
**Delivery in solid plastic case**

## Pressure drop method

### Unit under test

$P_o = -50 \dots 50 \text{ mbar (P}_{rel})$

LTBG 03  
LTBG 05



Vacuum pump

# - 136 - Alternative Propulsion System

LTBGD 05\_EV

042717\_2



## Tightness-Testing Kit for Battery Housings with higher volumes e.g. HV-battery (more than 5 cdm) - digital version

LTBGD 05\_EV allows a Tightness-Test-Procedure with vacuum or/and Pressure LTBGD 05\_EV ist equipped with a special HV-Test-Adaptor (HV = High Voltage) in order to induce vacuum or pressure into the battery-housing tested Vacuum and Pressure generator are powered by workshop pressure

- Measurement range: -50 mbar ... +50 mbar [Prel]
  - Accuracy: 1.6 % FS
  - Resolution: 5 mbar (0,005 bar)
- also available as analog version

Delivery in solid plastic case

LTBG\_PA 01\_LR

042728\_1



## Tightness-Test-Adaptor for battery cases via HV-connection

Adapter for connection to the battery housing via the high-voltage connection. For the inflation of pressure or vacuum for leak testing.

LTBG\_PV 01\_LR

042729\_1



## Tightness-Test-Adaptor for LTBG\_PA01\_LR

Adapter for closing the LTBG test adaptor (LTBG\_PA 01\_LR), for leak testing of LTBG devices (self-test).

## Cooling system

FT 2030\_AL

110311\_1

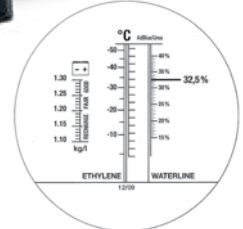


## Refractometer

Refractometer in solid aluminium housing, very robust. Adjustable eyepiece permits adaptation to the user's eyesight.

Scales for different liquids available.

Further description, see chapter Cooling System, page 18 and following.



TVUD 139/1

010136\_1



## Cooling system tester with digital pressure measurement and indication

Application: If small leaks/ pressure loss has to be detected.

- Measurement range: 0...4 bar
- Accuracy: 1 % FS
- Resolution: 10 mbar (0.01 bar)

Further description, see chapter Cooling System, page 10 and following.

## K-Adapters



## Example adapters

for electric and hybrid vehicles. Can also be used for cooling systems or thermal management systems.



KVB 01

011401\_1



## Vacuum cooling system filler with quick coupling

The unit can be used with any LEITENBERGER Radiator Adapter with a K., KS., KW. or UA. prefix (for customers who already have K., KS., KW. or UA Adapters).

1 vacuum cooling System filler

1 venturi nozzle

2 suction/emptying tube PVC, each 1.50 m long

Delivery in solid plastic case

### Applications:

- rework process
- test benches
- suitable to charge „wet“ and „dry“ systems
- operator independent and reproducable filling results
- automatic or manual processes possible
- creation of Testand/or Filling processes (RD/ process-planning purposes)
- static and dynamic tightness test of cooling systems

### Controller and Operation:

- via graphical user interface of external computer
- the „Admin-level“ allows to create and save new processes
- the „User-level“ allows the „run out“ of processes

### Adaptors:

- The adaptors to the expansion tanks are NOT included in the delivery.
  - We offer a range of ca. 400 different adaptors.
  - Adaptors at 180°, 90° or 90° with a flexible hose are available.
- Please do not hesitate to contact us concerning this issue.

1 mobile cart

1 high performance vacuum pump, 230 VAC, adjustable final vacuum

1 drainage container (to protect vacuum pump)

1 Controller-Box

2 Hoses á 1.5 m, (for suction and filling)

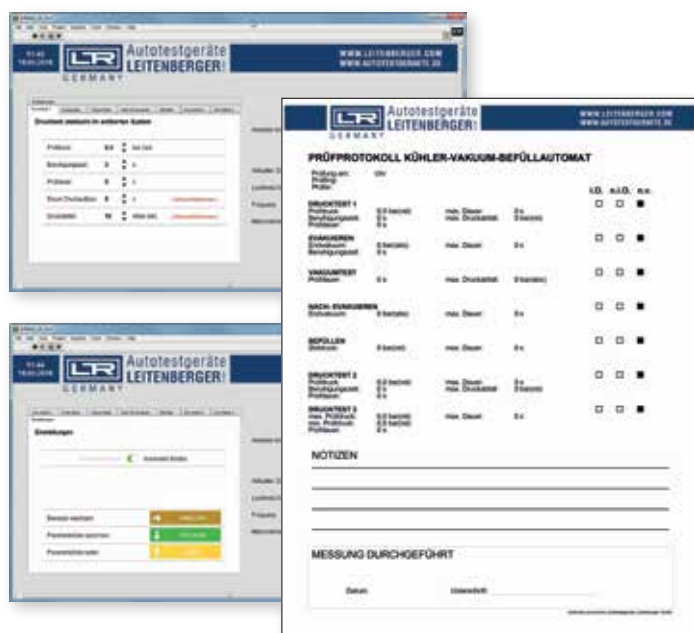
1 x 30 Liter container for fresh coolants  
without adaptors to the expansion tank

KVBA 01

011415\_1



Automatic evacuation, filling and testing device for cooling systems, thermal management systems and Fuel cells of electric vehicles.



# - 138 - Alternative Propulsion System

EV 30\_12VDC

011411\_1



## Mobile, electrical vacuum pump absolute vacuum 30 mbar (pabs)

For mobile use! Absolute vacuum ca. 30 mbar.

A better (deeper) final vacuum, better filling results can be obtained. Of course all components exposed to the vacuum level must be designed and manufactured to withstand these physical conditions.

- Operating voltage: 12 VDC, suitable for mobile use
- Current consumption: approx. 3.5 A
- Final vacuum: (pabs): 30 mbar, (prel): ca. -970 mbar / ca. -0.97 bar
- Weight: 1.6 kg

EV 30\_12VDC can be used with any of the Leitenberger KVB and it is delivered "ready to use". In the delivery of EV 30\_12VDC no adapter towards the expansion tank is included.

MTi 801

041710\_1



## Insulation Resistance Tester

As the EV (Electric Vehicle) and HEV (Hybrid Electric Vehicle) market is becoming larger, the importance of accurately measuring insulation resistance values is growing bigger and bigger.

With the new developed MTi 801 you have an accurate, reliable insulation tester with „analog“ bar graph for voltage and resistant measurements, continuity and insulation test.

## Coolant diagnosis

CD

-



## Coolant diagnosis

For monitoring the coolant quality in internal combustion engines and technical systems.

Coolant is used for thermal protection and for increasing performance and operating safety in the majority of internal combustion engines that are currently used in motor vehicles, rail vehicles, ships, block-type thermal power stations and industrial systems, for example.

Monitoring of the coolant quality as a preventive measure increases operational safety and reduces the operating costs.

Code	Description	Ref No.
CD 01	The most extensive coolant analysis will be returned 4 - 5 working weeks after receipt of the samples.	110407_1
CD 02	A complete coolant analysis will be returned 2 - 3 working weeks after receipt of the samples.	110407_1
CD 03	A preliminary coolant test will be returned 1 - 2 working weeks after receipt of the samples.	110407_1

PEK 01

110400\_1



## Sample taking kit

With the PEK 01 - the sample taking kit - you can easily and conveniently put liquid samples into the supplied sample bottles. **Caution: Not for aggressive acids. Vapours could destroy the pump.** It may only be used for substances against which its plastic components are resistant. Please inform yourself about „Chemical Resistance of Plastics“.

A vacuum is created with the manually-operated piston that draws the fluid into the original sample bottle.

**1 PEK 01 pump**

**6 Sample bottles 100 ml**

**6 PE suction hose à 900 mm**

**1 Direction for use**

**Delivery in solid plastic case**

NOTES

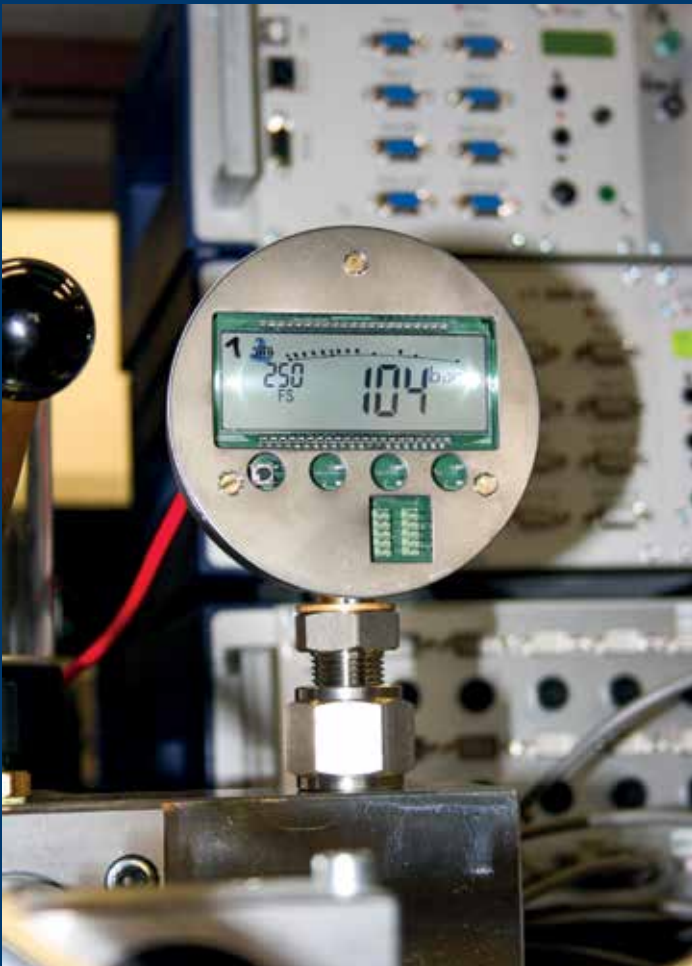
A series of horizontal blue lines on a white background, providing space for notes on both sides of a central vertical line.



Quality testing and assurance, the last step at the end of series production of our hydraulic test equipment.

Digital Manometer on the pressure comparator for calibration.

CNC production for large and small series, prototypes and one-off production.



## Miscellaneous

- Tool Set for park distance control
- Pressure plate set
- Flowmeter for air
- Mudguard protection
- Steering wheel protection
- Seat cover

MISCELLANEOUS



QR-code on the topic of  
Miscellaneous



## Tools

Useful, popular tools for everyday problems in the repair or maintenance of vehicles.

PDC 01

130600\_1



### Tool Set for park distance control

13 pcs. tool set for drilling, punching and milling of holes for park distance controls that fits exact.

- burr-free drilled hole edges
- drilling without scrapes or dents in the paintwork
- fits accurately
- easy to use

- punching tool, round 18,0 mm**
- punching tool, round 20,0 mm**
- punching tool, round 22,5 mm**
- punching tool, round 26,0 mm**
- stepped drill, titan nitrided 4 - 12 mm**
- stepped drill, titan nitrided 4 - 20 mm**
- stepped drill, titan nitrided 4 - 32 mm**
- set of millers, 6 pcs. HSS shaft 6 mm**

**Delivery in solid plastic case**

DPS 01\_LR

400004\_2



### Pressure plate set

Plate to be used in workshop presses, load 30 tons. Universal 3 spot adjustment ensures a tilt-free working. Bolts adjustable in height.

DFLp

-



### Flowmeter for air

DFLp-series is suitable to test small mobile compressors.

**Applications:** e.g. suspension, pneumatic pressure driven SCR-Systems (in large mobile engines), etc.

	DFLp 4...30_LR	DFLp 5...50_LR
Ref No.	061121_1	061122_1
Flow measurement range	4...30 L/min	5...50 L/min
Calibration: at 20°C and atmospheric pressure		
Media: Air only		
Pressure measurement range: 0...25 bar		
Inlet: Quick connector for PA-tube		
Outlet: 3/8", open		

### Note:

DFLp is NOT suitable to test the compressor of pneumatic brake systems! For this specific application we recommend the Leitenberger-device VPG 02.

Further versions on demand.



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**Explanation:**

**MB** measuring range  
**GSK** protective rubber cap  
**AG** male thread  
**IG** female thread  
**DS** dial size

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