



vitaldrive

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**MOBILE CABLE TEST VAN
HVT-35**

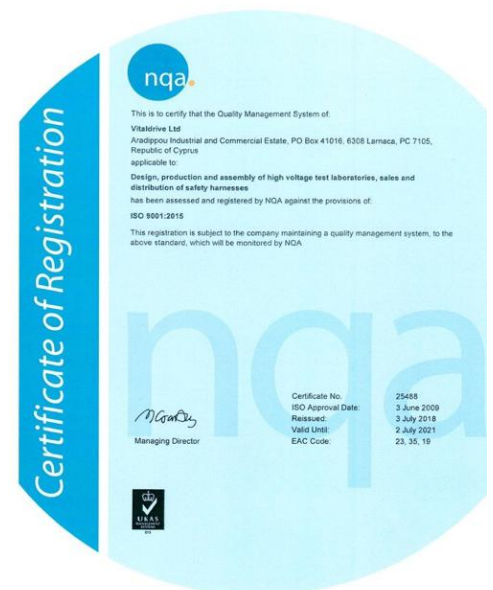


Larnaca, Cyprus

Mobile Cable Test Van HVT-35

The cable test van HVT-35 performs the following functions:

1. Very Low Frequency (VLF) AC voltage 0.1-0.01 Hz high voltage withstand test of power cables
2. DC high voltage withstand test of power cables
3. Burning down defective insulation of power cables
4. Pre-locating power cable faults by the pulse echo method (TDR), the arc reflection method, the impulse current method
5. Insulation Resistance Testing
6. Audio frequency cable route tracing and cable depth evaluation
7. Locating power cable faults by the acoustic and inductive methods
8. Isothermal relaxation current (IRC) and recovery voltage measurement (RVM) testing
9. Cable sheath fault location and testing
10. Earth ground testing
11. Cable phase identification measurements



A. MAIN EQUIPMENT

1. Central Control Operating Unit

The Central Control Operating Unit is designed around the operator needs. Ergonomic, all tests and controls easily accessible, operator can perform with ease all the required tasks for cable testing and fault location while being in a comfortable working position. An industrial panel computer, installed into the control panel, is provided to interact with the installed testing units and to store data and to prepare reports that can also be exported to USB drives. The system integrates automatic check-safety features and monitoring of mains supply voltage is performed with over-voltage and under-voltage automatic protection features. A transparent separation wall allows the operator to have complete and continuous visibility of the technical area. The polished, practical and efficient design of the cable fault locating van guarantees efficient operation of all systems from every perspective.



**image for reference only*

CABLE HIGH VOLTAGE TESTS

2. AC Hipot VLF-6022CMF

The VLF-6022 CMF hipot is an AC output tester but with an output frequency of 0.1 Hz or lower rather than 50Hz. Although the frequency is very low, it is still an alternating current with polarity reversals every half cycle. At 0.1 Hz output, rather than 50Hz, it takes 500 times less current and power to apply an AC voltage to a capacitive load, like a long cable. This model, with its 62 kVac peak output, is suitable for testing cables rated up to 36 kV. Its high load capacity enables it to test up to 24 km of cable, depending on type. The model includes an enhanced features package: a charging current and load capacitance meter, test dwell timer, and polarity indicating lights.



Input:	230V, 50/60Hz, 5 amps
Output	0 - 62 kVac peak, 0.1/0.05/0.02 Hz sinusoidal
Duty	Continuous
Load	1.1 μ F @ 0.10 Hz: 1.6 - 3.2km of 15 kV cable
Rating	2.4 - 4.8km of 25 kV cable
	3.2 - 6.8km of 35kV cable
	2.2 μ F @ 0.05 Hz: twice the above distances shown for 0.1Hz.
	5.5 μ F @ 0.02 Hz: five times the above distances shown for 0.1Hz
Metering	Voltmeter: 0 - 65 kVac peak
	Charging Current meter: 0 - 100 mA peak
	Load capacitance meter: 0 - 6 Microfarads
	User programmable test duration timer



Size & Weight Controls: 660 mm w x 330 mm d x 406 mm h,
 HV Tank: 381 mm w x 260 mm d x 546 mm h,
 Controls: 34 kg, HV Tank: 45 kg

3. DC Testing – PTS-80F

The PTS DC Test Set of CE marked products is a combination of high voltage DC proof and HiPot testers and HV Megohmmeters. Testing for dielectric strength and insulation resistance is now served with one instrument, saving money, size and weight. The PTS is designed and constructed with field use in mind. It is rugged, reliable and contains all of the features needed for electrical maintenance testing of new or installed electrical apparatus.

Specifications:



Input: 230V, 50/60Hz, 5 amps
HV Output: 0-80 kVdc, 10mA
 Negative Polarity, Positive Ground
Duty: Continuous
Kilovoltmeter: 3.5", Scaled 0-40/80 kVdc, $\pm 2\%$ F.S.
Currentmeter: 3.5", Scaled 0-1.0 uAdc, $\pm 2\%$ F.S. with multipliers of x1, x10, x100, x1k, 10k Guard/Ground Load return
Megohmmeter: Scaled 100-1 MOhms, with multipliers of x0.1, x1, x10, x100, x1k
Dimensions: 356x279x457 mm
Weight: 28 kg

Advantages of PTS Portable DC Test Sets:

- Five range current meter with a 0-1 uA low range for Leakage Current measurements
- 10 mA output current rating for fast charging
- Resistance measurements at any output voltage
- Regulated input for accurate, reliable results (ideal for field generator use) $\pm 1\%$ stability with $\pm 10\%$ line change
- Ripple less than 2.5% RMS
- Internal HV shorting solenoid with discharge resistor
- Continuous Duty Operation
- Automatic transit protected meters
- Rugged case with cushion grip handles and shorting stick included.

CABLE FAULT LOCATION

4. Surge Generator, Fault Burner – CDS-3632

A surge generator is used to inject a high voltage DC surge into the faulty cable. By supplying a sufficiently high voltage to the faulty cable, the open-circuit fault will break down creating a high-current arc. This high current arc makes a characteristic thumping sound at the exact location of the fault. To find the location of cable fault using the thumping method, a thumper is set to thump repeatedly and then walking along the cable route to hear the thumping sound. The higher the dc voltage applied, the louder will be the resulting thump.

To deliver the full joules of energy possible to a fault, the capacitors within a thumper must be charged to the maximum voltage. With the wrong thumper, this often results in thumping a cable at an excessive voltage, causing significant damage to insulation and accessories. Since the applied voltage is a square function ($\frac{1}{2} CV^2$), if the thumper is at $\frac{2}{3}$ voltage, only 45% of the joules are delivered to the fault. At half voltage only 25% energy is delivered, making the fault hard to hear. Either fault locating takes far longer than necessary or the crew gets impatient and turns the voltage all the way up to get the loudest bang. The fault is found but more are made. This practice can and should be avoided.

The CDS 3632 is a controlled energy fault locator/burner for testing and fault locating in primary cable systems. It is designed to provide constant energy at each of three different selectable output voltages. This controlled energy feature provides full energy at each output voltage tap, allowing the user to thump at a lower voltage with a higher energy while minimizing further cable damage. The measure of a good thumper is not the maximum voltage it can discharge, but the minimum voltage still capable of delivering the full energy.



Technical Specifications:

Input:	230V, 50/60Hz, 15 amps
Output Burn:	0-9/18/36kV
Current:	280/140/70 mA
Energy:	3200J at full output on all output taps
Polarity:	Negative output
Duty:	Continuous
Repetition rate:	6 to 10s, variable
TDR interface	ARC Reflection, Current Impulse and Voltage Decay
Voltmeter:	3.5", Scaled 0-40kVdc, $\pm 2\%$ F.S.
Current-meter:	3.5", $\pm 2\%$ F.S. Ranges: 0-500uA, 0-50mA, 0-500mA
Dimensions:	635x737x1130 mm
Weight:	204 kg

Features:

- Single piece combination Hipot, Burner and Surge Generator to support Fault Location on power cables
- Constant energy at each output voltage setting

- Adjustable thump (impulse) repetition rate, from 6 to 10 seconds
- Motorized output voltage tap switch
- Simplified Controls for minimal operator training
- Zero Start high voltage interlock
- Single pulse or continuous discharge modes

5. Reflectometric system TS 80

The TS 80 and TS80R reflectometric system is a powerful system for the prelocation of faults by the most popular systems TDR (Time Domain Reflection), ICE (Impulse Current Equipment Method), ARC (Arc Reflection Method) which use a surge generator current impulses or also known as

a shock wave generator, and finally the novel method of DECA Y (Voltage Decay) this method requires a high voltage source that allows us to pre-locate faults with breakdown voltages higher than 40kV.

The main objective of the use of reflectometry is to define an environment where a power cable is failed in the fastest and most accurate way, which allows us to generate the optimal base and then be able to accurately point out the aforementioned fault.



Technical Specification:

Range of distance	<i>Km @ 1000 m 250 80m / usec</i>
Pulse Width	150 ns to 8µs
Pulse amplitude	20Vp to 100 Vp
Resolution	1m @ 80m / usec
Sample frequency	80 Mhz
Methods	TDR, ICE, ARC and DECA Y
Output Impedance	50 ohms
Measurement	Scrollable Cursors on the screen
VP / 2	Adjustable between 50 m / usec-150m / usec
Zoom	Yes
Memory	> 1000 reflectograms
Connections	USB2.0 - BNC
Screen	8.4 "TFT color high contrast, 800 x 600 pixels, LED backlight
Dimensions mm. (width height depth)	162 x 365 x 273
Weight	2 kg
Feeding	100 – 240 VAC / 50 Hz
Operating Temperature	-10 ° C ... + 50 ° C

B. ADDITIONAL EQUIPMENT

6. Super Directional Acoustic Detector S.D.A.D



For pinpointing of faults in buried cables the acoustic method is used to pin-point the exact fault location. The surge generator CDS-3632 is used in repetitive pulsing mode. High energy pulses which are released from the CDS-3632 force a voltage pulse to travel along the cable. At the fault the flashover happens. This causes a high acoustic signal that is locally audible. Depending on the pulse energy, the intensity of the acoustic signal varies. These noises are detected on the ground surface with the addition of the S.D.A.D. The Super DAD conveys more information about the fault location, and faster, with the addition of new microprocessor-controlled electronics that provide bright, easier-to-see-and-read signals - day or night.

The SDAD has three modes of operation:

- Basic DIRECTION-TO-FAULT, with centering ability
- Time-based distance to fault, triggered by ballistic impulse (Magnetic thumper wave) to eliminate false tripping due to background noise
- FAULT DEPTH indication

All other features are the same as the D.A.D., which has been proven to be the industry-standard for detection of thumper pulses, and is in use by most leading utilities in the U.S.

Complete Detection System includes:

- Two earth Probe Microphones
- Two Tripods (for use on hard surfaces)
- Two Microphone Cables
- A-T Ballistic Impulse LED bargraph display
- Direction to fault indication (Super bright LED's)
- Stereo Headphones - High quality and comfortable
- Audio output limitation: Automatic ear protection for the operator, even if a microphone is dropped.
- Foam lined carrying case
- Instruction Manual & Batteries



Features:

- Dual channel system designed to work with any brand thumper
- Ultra-high speed clock indicates direction to the fault
- Soft coil microphones (earth probes) with tri-pod bases for hard surface location
- Ballistic impulse detector visually confirms the presence of the “thump”
- Three different modes of operation: Direction-to-fault, time-based distance to fault and fault depth indication

7. Audio Frequency Cable Tracer Set IFL-1210

The IFL-1210 cable locator set is used for the successful location of the exact track and depth of different underground networks (cables and metallic pipelines). This lightweight user friendly instrument operates at multiple active frequencies and provides passive 50/60 Hz detection services as an excellent safety feature for identifying live underground utility cables. The IFL-1210 features a digital readout of the depth reading that helps to identify service depths prior to digging.

Application:

- Accurate (30-50 cm) localization of the pipe or cable site,
- Accurate definition of the depth of location (up to 10 meters).
- Digital measurement of their bedding
- Tracing of loaded and dead cables
- Determination of a current in discovered loaded cables.
- Investigation of the ground before earth-working
- Determination of the cables deviation from the utility pipelines.



TRANSMITTER

Operating Frequency:	200-10000 Hz
Modes of Generation:	Continuous, Intermittent, tri-band (three frequencies)
Permissible Load Resistance:	0 ... ∞
Specified Output Current:	
Continuous and tri-band Intermittent	0,1 ... 10 A
Max Output Power Battery Operated	0,1 ... 15 A
External Battery Operated	120 W (continuous) / 180 W (intermittent)
Protection	180 W (continuous) / 270 W (intermittent)
Dimensions	IP 54
Weight:	305 x 270 x 194 mm
	12 Kg



RECEIVER

Operating Frequency:	Active: 512, 1024, 1450, 8928, 9820 Hz
	Passive: 50/60 Hz, 100 Hz, 12-24 KHz
Max Depth Measurement	Up to 10 m
Max Depth of Detection:	Up to 25 m
Max Distance of Detection:	Up to 5 Km
Continuous Operating Time:	Up to 50 h
Operating Temperature:	-40 ... +60 °C
Dimensions:	720 x 110 x 150 mm
Weight:	1,7 Kg

8. Insulation Resistance Tester C.A 6550

The CA6500 insulation tester with its site-proof casing is suitable to check equipment insulation during manufacturing, on-site installation work, periodic inspections and recommissioning of installations. It complies with the most recent recommended practices while taking into account future developments. The multiple test modes mean that you can both assess the insulation in qualitative terms by non-destructive testing and use samples to investigate insulation ageing problems for preventive maintenance purposes. The unit offers quick, effective checking of test execution by displaying the evolution of the test in progress in graphic form.



Technical Specifications:

Test Voltages	Ranges	500V: 10 kΩ to 2 TΩ 1000V: 10 kΩ to 4 TΩ 2500V: 10 kΩ to 10 TΩ 5000V: 10 kΩ to 15 TΩ 10000V: 10 kΩ to 25 TΩ
	Fixed Test Voltages	500, 1000, 2500, 5000, 10000
	Variable Test Voltages	40V – 10000V, 3 pre-settable voltage values
	Adjustment Increment for Variable Voltages	Variable:40-10KV Step: 40V-1KV:10V 1KV-10KV:100V
	Ramp Mode	3 pre-settable ramps: start voltage/end voltage/duration
	Ramp Configuration Range	40-1100V / 500-10000V
	Step Mode	Up to 10 steps (value and duration configurable for each step)
Voltage Measurement		AC:0-2500V / DC: 0-4000V
After Test Capacitance Measurement		0.001-9.999 μF / 10.00-49.99 μF
Leakage Current Measurement		0 – 8 mA
Discharge After Test		Yes / Automatic
Additional Test Stop Modes	I-limit	Programmable: 0.2-5mA
	Early-Break	di/dt
	Timer	Up to 99 minutes 59 seconds
Burning Mode	Burning	Constant testing
Ratio Calculation		PI, DAR, DD
Calculation of R at ref. T°		Yes
Measurement Filter	Display	3 filters with 3 possible time-constant
Graphs on Display		R(t)+u(t);i(t);i(u)
Storage		256 recordings, 80000 points: R, U, I and date
Communication		Optically isolated port for USB and RS232 links
PC Software		Dataview
Power Supply		NiMH rechargeable batteries, 8x 1.2 V / 4,000 mAh, charging by external voltage: 90-260 V 50/60 Hz
Battery Charging		Battery charging possible while performing insulation measurements
Electrical Safety		1000 V CAT IV – IEC 61010-1 and IEC 61557
EMC, Mechanical Protection, Altitude		EN 61326-1, IP54, 3000m
Dimensions		340x300x200 mm (LxWxH)
Weight		6.2 kg

9. Cable Identification Live

Easily identify one cable from another. Whether you are in the trench or out of the trench, transformer to transformer, house to transformer, pole to transformer, or ground rod to ground rod you will be able to diagnose the situation quickly.



- Primary or Secondary
- In or Out of the Trench
- Tx-Former to Tx-Former
- Tx-Former to Meter
- Energized or Grounded
- Secondary, jacketed primary, or streetlight.
- Simple & Easy to Use

10. Cable Sheath Tester EG3000T

The cable sheath tester EG3000T is a complete system, employing the most effective fault location electronics, plus many features and operational convenience. The unit with its automatic cable-saving voltage control is used to locate all unshielded cable faults and sheath-to-ground faults. When pulsing a line to establish a fault, the tester applies only the breakdown voltage needed. Just as important, once the breakdown or flash to ground is achieved, the voltage is automatically reduced to the minimum amount needed to keep the fault alive and the fault current is increased. Up to 2.2 amps is available to locate through asphalt and concrete or dry sand and soil.\

- Faults up to 20 Meg Ohm
- Over 2 amps of current available
- Automatic voltage control
- Up to 3 kV output
- Operates from 230V source, 12V external source, or 12V 7Ah rechargeable internal battery
- Prevents cable and insulation damage
- Proof tests cables before returned to service



11. Earth Ground Resistance Meter 1632-2

The Earth Ground Tester performs all four ground tests quickly and accurately. The earth ground tester measures earth ground loop resistances using only clamps, only stakes, or one clamp and stakes. With the stakeless test method, the unit is able to measure earth ground loop resistances for multi-grounded systems using only current clamps. This technique eliminates the dangerous, and time-consuming job of disconnecting parallel grounds, and finding suitable locations for auxiliary ground stakes.

Technical Specifications:

Display 1999 Digit LCD:	Display with special symbols, digit height 25 mm, fluorescent backlight
User Interface:	Instant measurement through TURN and START one button concept. The only operating elements are rotary switch and START button
Memory:	Internal memory storage up to 1500 records accessible via USB port
Temperature Coefficient:	$\pm 0.1\%$ of reading
External Voltage:	V ext, max = 24 V (DC, AC < 400 Hz), measurement inhibited for higher values
V ext Rejection:	> 120 dB (162/3, 50, 60, 400 Hz)
Measuring Time:	Typical 6 seconds
Battery Life Span:	Typical > 3,000 measurements
Dimensions:	250 x 133 x 187 mm
Weight:	7.6 kg incl. accessories



12. Digital Multimeter 83V

The digital multimeter 83V has improved measurement functions, trouble-shooting features, resolution and accuracy to solve more problems on motor drives, in plant automation, power distribution and electro-mechanical equipment. The units are independently tested to comply with the 2nd edition of ANSI/ISA S82.01 and EN61010-1 CAT IV 600V/CAT III 1000V.



Voltage DC:	Maximum Voltage: 1000V Accuracy: $\pm(0.1\%+1)$ Maximum Resolution: 100 μ V
Voltage AC:	Maximum Voltage: 1000V Accuracy: $\pm(0.5\%+2)$ AC Bandwidth: 5kHz Maximum Resolution: 0.1 mV
Current DC:	Maximum Amps: 10A(20 A for 30 seconds maximum) Amps Accuracy: $\pm(0.4\%+2)$ Maximum Resolution: 0.01 mA
Current AC:	Maximum Amps: 10A(20 A for 30 seconds maximum) Amps Accuracy: $\pm(1.2\%+2)$ Maximum Resolution: 0.01 mA
Resistance:	Maximum Resistance: 50 M Ω
Capacitance:	Maximum Capacitance: 9,999 μ F
Frequency:	Maximum Frequency: 200 kHz

C. CONNECTING DEVICES

13. Main HV Switch

The main high voltage switch along with the control panel form the heart of the testing process of the cable test van. The unit is air-insulated with a reliable and robust design. The switch once it receives power through the control panel it selects and gets locked to a particular high voltage instrument. Once the test is completed the unit automatically connects to ground making the operation of the test van safe.



14. Cable Drum Racks

External connections for the cable diagnostic test van are provided with power feeding cable drum, grounding cable drum and a high voltage cable drum.



- Drum with main power cable, $U_{\text{insulation}} = 1000 \text{ V}$, cable length 50 m
- Drum with grounding cable with a cross-section 25 mm^2 copper transparent plastic sheath with connection every 4 to 5 m, cable length 50 m
- Drum with output HV shielded cable, cable length 50 m
- Drum with auxiliary ground cable, cable length 15 m

D. ELECTRICAL SAFETY SYSTEM

15. Electrical Safety Check System

The electrical safety system provides protection to the operating personnel as follows:

- Monitoring the potential on the car (switching off if the potential is higher than 24V)
- Monitoring the earth resistance (switching off if the resistance is higher than 25 Ohm)
- Monitoring the door of the high voltage compartment (switching off the equipment if doors are opened)
- Emergency Switch to shut down the equipment in case of hazard
- Visible break load switch
- Beacon and warning siren



E. PROTECTIVE EQUIPMENT

16. Voltage Detector

Voltage Detectors are used to verify live or de-energized conductors. These testers may be used with rubber insulating gloves or hot sticks using the splined universal end fitting. Testers indicate the presence of voltage with an extra bright LED light and a distinctive audible signal. It is recommended that the tester be moved closer to conductor until warning is indicated, or it touches conductor, apparatus, or test point. Test the unit on a nearby energized conductor.



17. Personnel Protective Equipment / Tool Kit

1	Ground pole / Insulating stick	1 unit
2	Dielectric gloves	2 pair
3	Dielectric boots	1 pair
4	Protective helmet	2 units
5	Tool kit	1 unit
6	Fire extinguisher	2 units
7	Reflecting triangle	1 unit
8	Ground spike	1 unit
9	Measuring wheel	1 unit

F. AUXILIARY GENERATOR

18. PowerAll PA200

When AC power is required and network connection is not possible, then PA200 is a system that will help. By using the vehicle's engine as the primary source of energy, the PA200 is a light weight, easy-to-use, efficient, and reliable 230V AC power source in mobile applications. As the system is battery-independent, the PA200 can generate its rated power all day without compromising performance or efficiency.



Technical Specifications:

Rated Voltage	230 V
Rated Current	30 A
Rated power	7350 VA
Rated Frequency	50/60 Hz
Construction	Class 1
Cabinet	Black powder coated steel
Dimensions	393 x 183 x 160mm
Weight	6.5 kg

Features:

- Continuously rated – generate power all day with no need to refuel
- Light weight – typically 87% lower than a generator, increasing available payload
- Less space requirement – typically 98% less volume than a generator
- Low engine revs (typically 1250 rpm) to reduce fuel consumption and clean exhaust emissions
- CE marked and fully EMC compliant

G. VEHICLE

19. Chassis: Mercedes Sprinter



High performer and workhorse – the new Sprinter is more than a vehicle: it's a true partner you can always rely on to support you all the way when there's a job to be done. As the van that established a whole vehicle segment, the Sprinter has been ahead of the crowd since 1995. It is known above all for its outstanding operational reliability which gives users the freedom to concentrate fully on their business activities. The latest generation of the Sprinter lives up to this impressive reputation. It is the result of the process of continuous development with which we ensure that the Sprinter always offers the best in terms of reliability, quality, safety, flexibility, cost effectiveness, sustainability and service.

20. Vehicle Body Work

The test van is designed to be easy to operate and service. It is equipped with high quality insulated wall paneling and air conditioning. The body is divided into technical and operator compartments separated by a partition wall. The technical compartment includes all the necessary tools and equipment for carrying out testing and inspections. Safety is an important feature of the test vans and hence all equipment is properly mounted and secured for transit. The operator compartment provides a pleasant environment to work in with more room and plenty of storage. It is equipped with cabinetry and workbenches that increase the operators' efficiency and productivity.

Features:

- Roof mounted air conditioner
- Internal lighting 230 VAC & 12V DC
- Insulated walls and roof for thermal and noise
- Special antistatic floor in operator area
- Special aluminum tread plate suitable for rough loading in high voltage area
- Partition wall, Operating desk & Swivel chair
- Drawers for storage of accessories



View of the Operator area

*Image for reference only



View of the Technical area

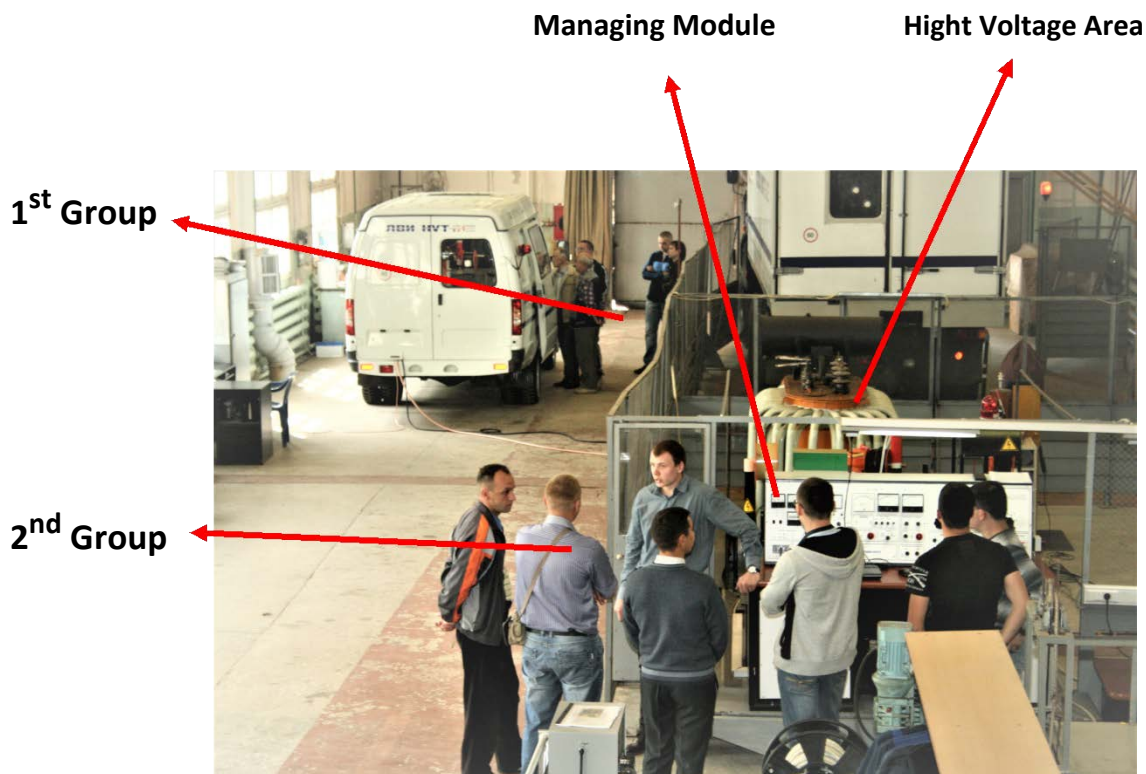
*Image for reference only

H. DOCUMENTATION

21. Included one full set of laboratory documentation.

I. TRAINING

22. Full training is provided for the test van personnel. The training includes the full use of the equipment and covers the basic test van operations such as safety management, routine and preventative maintenance of equipment.



J. WARRANTY

23. Our test vans are covered by a warranty for a period of one (1) year. At the end of this period, the manufacturer can provide upon order an after-sales service of the equipment.

K. CONTACT INFORMATION

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