

VAX020

High Voltage Amplifier

User's Manual



Megger

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1

Introduction

1 General

1.1 Description

VAX020 is a 2 kV voltage amplifier designed to work as an accessory to an IDA/IDAX test system, increasing the output voltage from 200 V to 2000 V peak (1414 V rms). The main application is insulation diagnostics in electric power systems with moisture assessment for oil-immersed transformers as a key area.

In particular, VAX020 is recommended in situations where measurements need to be performed during high interference, e.g. measuring low capacitance components in substations with severe AC and/or DC noise/offset.

1.2 Receiving instructions

Check the equipment received against the packing list to ensure that all materials are present. Notify Megger of any shortage. Telephone +46 8 510 195 00 and ask for the Customer Service Department.

Examine the instrument for damage received in transit. If damage is discovered, file a claim with the carrier at once and notify Megger, giving a detailed description of the damage.

This instrument has been thoroughly tested and inspected to meet rigid specifications before being shipped. It is ready for use when set up as indicated in this manual.

2 Safety

2.1 Symbols on the instrument



Caution, refer to accompanying documents.



Caution, risk of electric shock.



Protective conductor terminal.



WEEE, Waste Electrical and Electronic Equipment. Please utilize your local WEEE collection facilities in the disposition of this product and otherwise observe all applicable requirements.

2.2 Safety instructions



Important

Read and comply with the following instructions.

Always comply with local safety regulations.



Warning

- 1] The test set and the specimen to which it is connected are a possible source of high-voltage electrical energy and all persons making or assisting in tests must use all practical safety precautions to prevent contact with energized parts of the test equipment and related circuits.
- 2] Persons actually engaged in the test must stand clear of all parts of the complete high-voltage circuit, including all connections, unless the test set is de-energized and all parts of the test circuit are grounded. Persons not directly involved with the work must be kept away from test activities by suitable barriers, barricades or warnings.
- 3] High-voltage discharges and other sources of strong electric or magnetic fields may interfere with the proper functioning of heart pacemakers. Persons with heart pacemakers should obtain expert advice on the possible risks before operating this equipment or being close to the equipment during operation.
- 4] Treat all terminals of high-voltage power equipment as a potential electric shock hazard. There is always the potential of voltages being induced at these terminals because of proximity to energized high-voltage lines or equipment.
- 5] The instrument is equipped with a power cord with integral safety ground pin. The equipment must be connected to a grounded mains outlet.
The instrument case must also be grounded by the separate protective ground wire with connection to the protective earth terminal on the rear panel. This is to eliminate differ-

ence in earth potential between the instrument and the device to be tested. Check the continuity of the protective ground wire before each use.

- 6] Do not attempt to service the instrument yourself. Opening or removing covers may expose you to dangerous voltage. If you attempt to service the instrument yourself the warranty is no longer valid.
- 7] Do not use any accessories that are not intended for use together with the instrument.
- 8] Do not use the instrument for any purpose other than indicated by the manufacturer.
- 9] Never connect the test set to energized equipment.
- 10] Operation is prohibited in rain or snow.
- 11] Do not use the test set in an explosive atmosphere.
- 12] Disconnect the instrument from the mains before cleaning. Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleaners.



Important

- 1] Always use a safety ground stick to ground the high-voltage conductor. A safety ground jumper must then be installed between all terminals of apparatus under test and ground.
- 2] Always disconnect test leads from power equipment before attempting to disconnect them at the test set. The ground connection must be the first made and the last removed. Any interruption of the grounding connection can create an electric shock hazard.
- 3] Before making connection to the power source, determine that the instrument rating matches the voltage of the power source and has a suitable two-pole, three-terminal grounding connector.
- 4] The power input plug must be inserted only into a mating receptacle with a ground contact. Do not bypass the grounding connection. Any interruption of the grounding connection can create an electric shock hazard. Determine that the receptacle is properly wired before inserting the plug.
- 5] Routine maintenance is all that is required for these test sets. The cables and connector panel should be inspected frequently to be

sure all connections are tight and all ground connections intact.

- 6] A qualified operator should be in attendance at all times while the test equipment is in operation.
- 7] Refer to IEEE 510-1983, "IEEE Recommended Practices for Safety in High-Voltage and High-Power Testing," for information.
- 8] Make sure that air intake and fan exhausts are not blocked
- 9] Avoid dusty environments and locations because the accuracy can be affected by long-term exposure to dust
- 10] The VAX020 is designed for indoor and outdoor use. Although a rugged instrument, it should be well protected when moved or shipped.
- 11] The Protective Earth/Ground (PE) of the VAX020 is connected to the earth/ground pin of the inlet, making it grounded when the mains cord is connected.
- 12] Connect VAX020 to ground using the ground wing nut on the front panel to ensure protective grounding independent of the mains cord being connected or not.

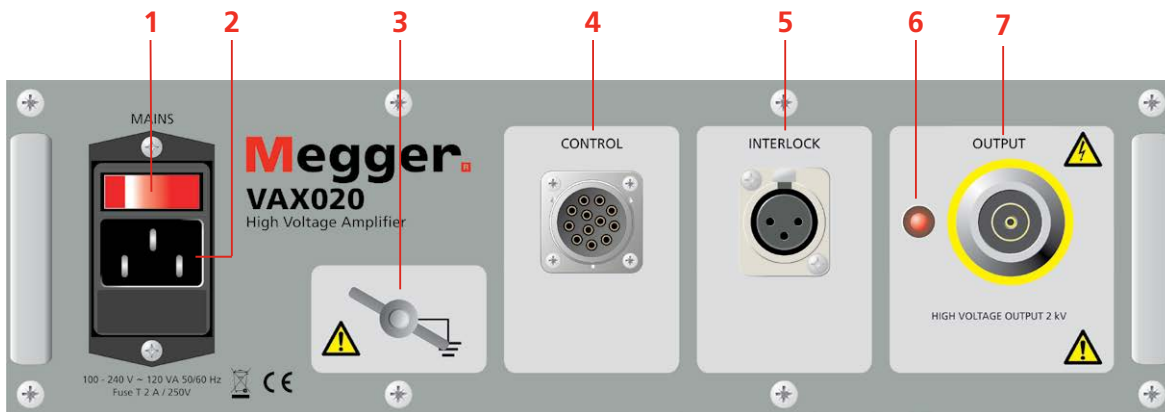
3 Control, indicators and connectors

3.1 Front panel

1.	ON / OFF switch
2.	Mains inlet
3.	Ground: wing nut/screw (PE)
4.	Control: multi-pin connector to IDAX
5.	Interlock: 3-pole XLR
6.	Output: red LED is lit when high-voltage output is active
7.	Output: HV connector for 0-2000 V

3.2 Back panel

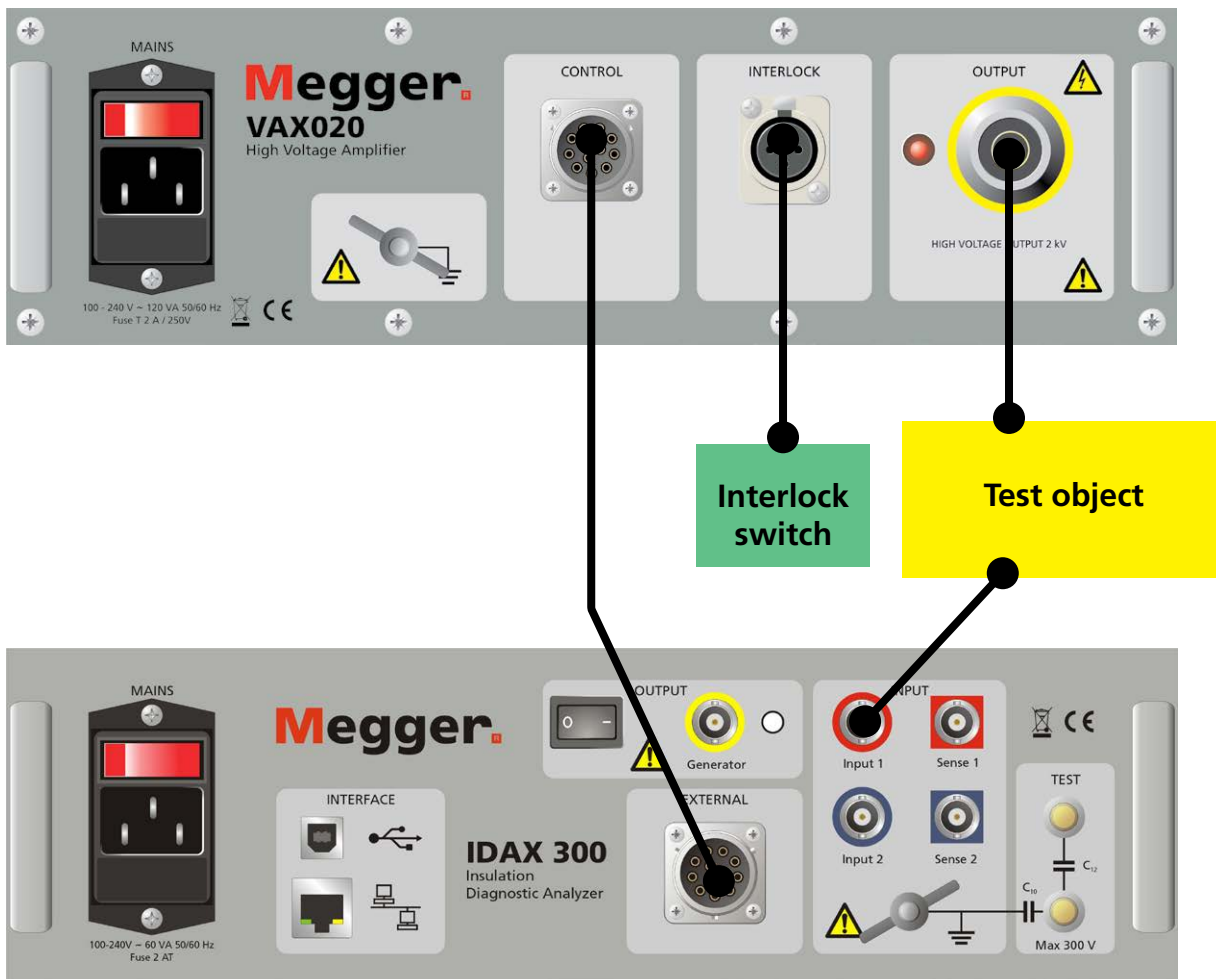
- Two holes/grids for fans
- Air inlet



4 Run VAX020

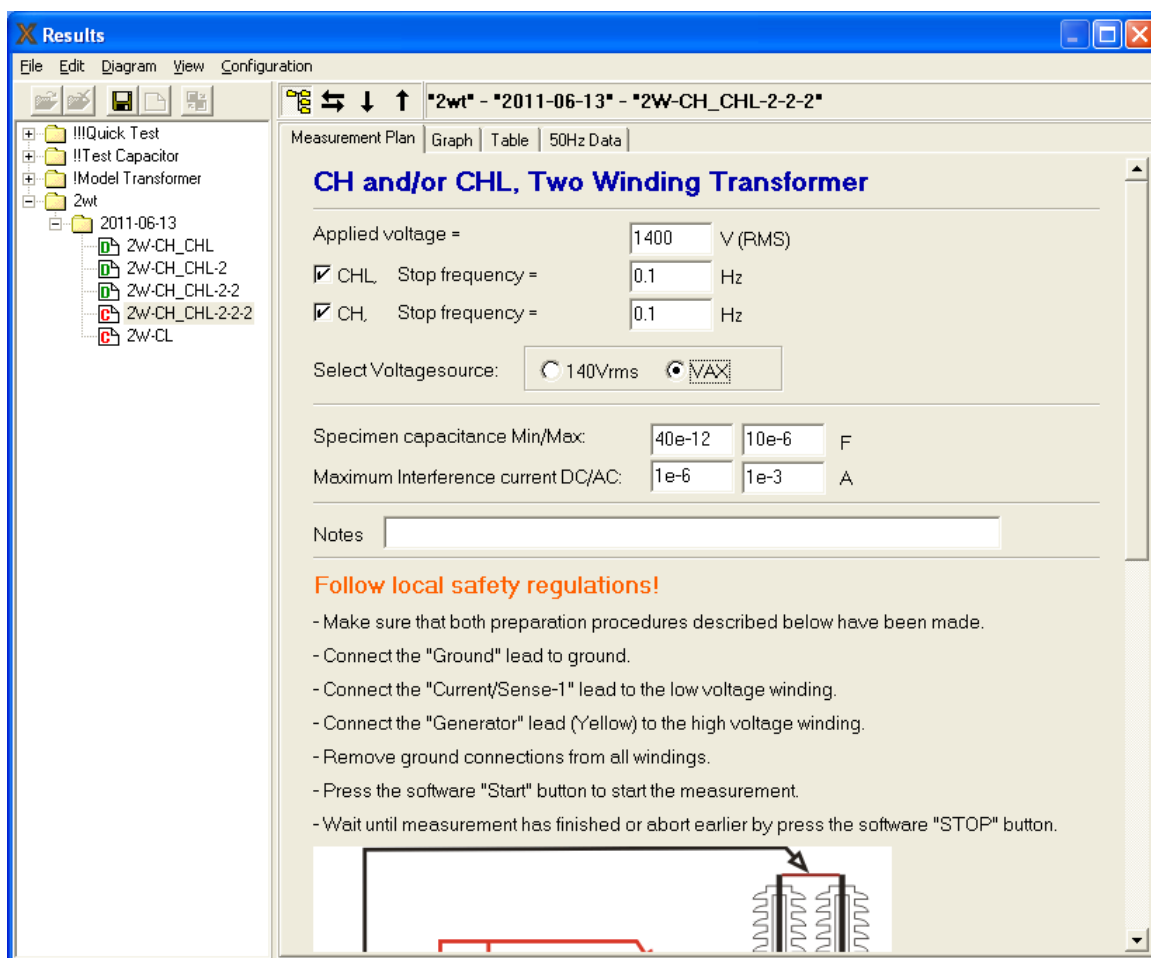
4.1 Connections

- 1] Connect VAX020 to protective ground on the IDAX using the Ground cable (green in the figure below)
- 2] Connect VAX020 (CONTROL) to IDAX (EXTERNAL) with the 12 pole multi-cable (blue in the figure below)
- 3] Connect an Interlock cable to the Interlock input (violet in the figure below)
- 4] Connect the VAX020 to the test object using the Generator cable (18 meter) with HV connector and clamp
- 5] Connect the Measure cable from the IDAX to the test object



4.2 Perform a measurement

- 1] Turn on the IDAX and the VAX020
- 2] Follow the standard IDAX procedure for measurement setup
- 3] When prompted to select voltage: choose VAX
- 4] Then add required voltage, e.g. 1400 V (RMS) (same as 2 kV peak)
- 5] Perform the measurement in the same way as a standard IDAX measurement. See IDAX User Manual for more details.



5 Specifications

Specifications VAX 020

Environmental

<i>Application field</i>	The instrument is intended for use in medium- and high-voltage substations and industrial environments.
<i>Ambient temperature</i>	
<i>Operating</i>	-20°C to +55°C (-4°F to +131°F)
<i>Storage</i>	-40°C to +55°C (-40°F to +131°F)
<i>Humidity</i>	< 90%RH, non-condensing
<i>CE-marking</i>	
<i>EMC</i>	2004/108/EC
<i>LVD</i>	2006/95/EC
<i>Category</i>	CAT 1
<i>IP class</i>	IP21

General

<i>Mains voltage</i>	100-240 V AC, 50 / 60 Hz
<i>Power consumption</i>	120 VA (max)
<i>Dimensions</i>	Instrument 335 x 300 x 99 mm (17.7" x 6.3" x 16.1")
<i>Transport case</i>	520 x 430 x 220 mm (20.5" x 17" x 8.7")
<i>Weight</i>	4.4 kg (9.7 lbs) without accessories

Interface

<i>Control</i>	Connects VAX020 with IDAX
<i>Interlock</i>	An external contact must be closed to allow the VAX020 to generate any voltage
<i>Output</i>	HV connector that connects VAX020 to the test object
<i>VAX020 can be used together with the following IDAX systems:</i>	IDAX300, IDAX300S, IDAX206-FR, IDAX206 and IDA200

Output

<i>Voltage</i>	2 kV (peak)
<i>Current</i>	50 mA (peak) above 50 Hz derating linearly to 30 mA below 10 Hz
<i>Frequency range</i>	DC-1 kHz
<i>Capacitive load capability</i>	0-20 µF
<i>Max capacitive load at 2 kV</i>	80 nF at 50 Hz 67 nF at 60 Hz

Your "One Stop" Source for all your electrical test equipment needs

- Battery Test Equipment
- Cable Fault Locating Equipment
- Circuit Breaker Test Equipment
- Data Communications Test Equipment
- Fiber Optic Test Equipment
- Ground Resistance Test Equipment
- Insulation Power Factor (C&DF) Test Equipment
- Insulation Resistance Test Equipment
- Line Testing Equipment
- Low Resistance Ohmmeters
- Motor & Phase Rotation Test Equipment
- Multimeters
- Oil Test Equipment
- Portable Appliance & Tool Testers
- Power Quality Instruments
- Recloser Test Equipment
- Relay Test Equipment
- T1 Network Test Equipment
- Tachometers & Speed Measuring Instruments
- TDR Test Equipment
- Transformer Test Equipment
- Transmission Impairment Test Equipment
- Watthour Meter Test Equipment
- STATES® Terminal Blocks & Test Switches
- Professional Hands-On Technical and
- Safety Training Programs

Megger is a world leading manufacturer and supplier of test and measurement instruments used within the electric power, building wiring and telecommunication industries.

With research, engineering and manufacturing facilities in the USA, UK and Sweden, combined with sales and technical support in most countries, Megger is uniquely placed to meet the needs of its customers worldwide.

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