

ASSOCIATED RESEARCH, INC.

MODEL SPECIFICATION - DC HYPOT

MODEL NUMBER: O 5220A

DESCRIPTION: Portable DC Hypot

PRIMARY APPLICATION: Dielectric withstand testing of rotating machinery, transformers, switchgear and cables for acceptance and routine maintenance in the field.

INPUT

Voltage: 115 volts AC

Frequency: 60 Hz

Phase: Single

Current: 2 amperes

OUTPUT

Voltage: 0-15 KV DC continuously adjustable

KVA: .03

Frequency: DC

Current: 2 milliamperes operating, 15 milliamperes short circuit

Duty Cycle: Continuous

Failure Detector: None - current limited against overload.

VOLTAGE CONTROL: Manually operated. No zero return interlock system.

METERING

Kilovoltmeter: Analog -- 0-6/15 KV

Milliammeter: Analog -- 0-2/20/200/2000 microamperes

Range: Dual range KV meter, four range microammeter.

TERMINATION

Input: Five foot, 3 conductor power cable terminated in 3 prong grounding type plug.

H.V.: Receptacle with disconnectable 15 ft. cable terminated in insulated clip.

Return: Metered-Bypass-Ground terminals with disconnectable 15 ft. cables terminated in insulated clips.

CABINETY: Portable style, 13½" x 14 x 8

WEIGHT: 27 lbs.

SECTION II
GENERAL FEATURES

GENERAL FEATURES

LINE CABLE

Three conductor input cable terminated in standard three-prong grounding type plug.

HIGH VOLTAGE CABLE

Single conductor high voltage cable terminated in male connector and insulated clip for connecting item to high voltage output.

RETURN CABLES

Single conductor cables each terminated in spade lug and clip for connecting the test item to the RETURN terminals.

HIGH VOLTAGE OUTPUT RECEPTACLE

Female connector to receive the high voltage output cable connector.

POWER SWITCH / CIRCUIT BREAKER / INDICATOR

Makes or breaks all primary power (line voltage) to the instrument. The illuminated switch indicates line power is available to the high voltage control circuit and any internal assemblies.

HIGH VOLTAGE SWITCH

Operating in the primary side of the high voltage control circuit it controls the energizing and de-energizing of high voltage.

HIGH VOLTAGE INDICATOR

Red lamp indicates the high voltage control circuit is energized and high voltage is available at the output.

KILOVOLTS RANGE SWITCH

Allows selection of the full scale range of the KILOVOLTMETER for more accurate setting of the output voltage.

VOLTAGE CONTROL

Permits continuous adjustment of the test voltage to the desired value from zero to maximum output of the instrument.

KILOVOLTMETER

Connected directly across the output to indicate correctly the voltage actually being applied to the test item, and is therefore independent of internal regulation.

MICROAMPERES RANGE SWITCH

Operating in the electronic metering circuit, this four position selector switch provides for changing the sensitivity of the amplifier to obtain the best meter readability. The MICROAMPERES range indicates full scale sensitivity of the microammeter.

MICROAMMETER

The MICROAMMETER indicates the leakage current in the METERED RETURN side of the output circuit. The meter is driven by a high gain balanced bridge electronic amplifier and is electronically protected against burn-out should it be accidentally overloaded.

GROUNDING SWITCH AND RETURN TERMINALS

Since this instrument incorporates a very low current range, provisions have been made for bypassing undesirable currents around the MICROAMMETER.

GROUNDING SWITCH AND RETURN TERMINALS (Continued)

The GROUNDING switch in conjunction with the METERED and BYPASS terminals provides a means for directing the unwanted current around the meter and the desired current through the MICROAMMETER.

By connecting the return side of the specimen to the METERED terminal and selecting BYPASS RETURN with the GROUNDING switch (which grounds the BYPASS terminal) all leakages from the high voltage connection to the specimen and other unwanted leakages to ground will be directed around the MICROAMMETER. Only the specimen leakage current will flow through the MICROAMMETER. By selecting METERED RETURN with the GROUNDING switch (which grounds the METERED terminal), the total leakage to GROUND will flow through the MICROAMMETER.

When testing a specimen that may have isolated metallic parts that provide a leakage or high resistance path between the two points where the high voltage and return connections are made, the BYPASS terminal may be used as a guard circuit. If these isolated metallic parts are connected together and to BYPASS terminal, any leakage from the high voltage point to these parts will be directed around the metering circuit.

NOTE: When using the BYPASS terminal as a guard circuit, the GROUNDING switch should be in the BYPASS RETURN position unless the specimen return side is earth ground. Under this condition the GROUNDING switch should be in the METERED RETURN position.

HIGH VOLTAGE POWER SUPPLY

The high voltage D.C. power supply uses long life silicon rectifiers. For operator safety and protection of the power supply against overloads a high reactance transformer is used. A high reactance type transformer is designed so that the output voltage will collapse should the current output exceed a given value. The chief advantage of the high reactance transformer is this inherent current limiting action which eliminates the need for a circuit breaker and prevents destruction of the item under test. Since current limiting does not depend on mechanical parts, its action is instantaneous and affords operator protection.

* OVERLOAD CURRENT SELECTOR SWITCH AND CONTROL

This instrument is equipped with an electronic circuit breaker, which allows the operator to select any desired output current from minimum to maximum microamps. Any time this selected output current is exceeded, when tests are being made, the output high voltage will be de-energized and it will be necessary to turn the H.V. switch OFF and then ON again before the high voltage can be re-applied.

* IF PRESENT (SEE SPECIFICATIONS SHEET).

"METERED RETURN" AND "BYPASS RETURN SELECTOR" SWITCH AND TERMINALS

Since this instrument incorporates a low current range, provisions have been made for bypassing undesirable leakage currents around the MILLIAMMETER circuit. These undesirable currents are usually due to leakage paths between high voltage connections and isolated metallic parts near or at ground potential.

The GROUND RETURN switch in conjunction with the METERED RETURN and BYPASS RETURN terminals provides a means for directing the unwanted current around the MILLIAMMETER and the desired current through the MILLIAMMETER.

By connecting the return side of the specimen to the METERED RETURN terminal and selecting BYPASS with the GROUND RETURN switch (which grounds the BYPASS RETURN terminal) all leakages from the high voltage connection to the specimen and other unwanted leakages to ground will be directed around the MILLIAMMETER. Only the specimen leakage current will flow through the MILLIAMMETER. By selecting METERED with the GROUND RETURN switch (which grounds the METERED RETURN terminal), the total leakage to GROUND will flow through the MILLIAMMETER.

When testing a specimen that may have isolated metallic parts that provide a leakage path between the two points where the high voltage and return connections are made, the BYPASS RETURN terminal may be used as a guard circuit. If these isolated metallic parts are connected together and to the BYPASS RETURN terminal, any leakage from the high voltage point to these parts will be directed around the metering circuit.

NOTE: When using the BYPASS RETURN terminal as a guard circuit, the GROUND RETURN switch should be in the BYPASS position unless the specimen return side is earth ground. Under this condition, the GROUND RETURN switch should be in the METERED position.

On the following pages are a simplified MILLIAMMETER circuit for this instrument and typical examples for connection for various types of high voltage tests.