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2.1 GENERAL DESCRIPTION

Hipotronics offers a complete line of dc power supplies with output voltages ranging from 1 to 2000 kV for high voltage testing, electrostatic applications, accelerators, capacitor bank charging, X-ray systems and many other uses.

A variety of circuits are employed to generate the required DC output. In general, low power supplies (below 10 kW) employ single phase inputs. Units above 10 kW have three phase input. High voltage, low power units are designed with Hipotronics' patented isolated primary to economize on space and cost. Rectifier circuits normally used are the full wave bridge or a voltage doubler. The power requirement of the supply and space limitations determine which type of rectifier will be used. A full wave bridge is capable of delivering higher current while a voltage doubler provides higher voltage from the same input. The three phase bridge has the advantage over a single phase circuit of providing 5% rms ripple (or 1% if both delta and wye secondary windings are provided) without the use of filters. The output of single phase circuits is filtered to provide 2% rms ripple. The capacitors in the filter store energy which results in high peak currents if a short circuit or arc occurs in the output.

2.2 FEATURES

2.2.1 Safety Features

- Adjustable overload relay, 10% to 110% of rated current, (1 millisecond sense, 2-3 cycle trip). A manual reset button is provided.
- Output shorting solenoid and/or stiff resistive bleeder.
- Series limiting resistor furnished in output circuit.
- Surge protection for all meters and relays.
- HV transformer provided with back-up circuit breaker in primary.

- Input circuit breaker with pilot light.
- External interlock provision with pilot light.
- Zero start interlock with pilot light.

2.2.2 Standard Features

- Output connected triple range voltage meter.
- Triple range current meter in return leg of HV circuit.
- Rated current available from zero to rated voltage.
- Reversible polarity.
- Solid state rectifiers.
- HV ON and OFF pushbuttons.
- Meter recalibration potentiometers.
- Continuously variable output voltage from zero to maximum.
- All 50 kW units and larger are provided with the patented Peschel Variable Transformer (PVT) to control output voltage.

2.3 OPTIONS

2.3.1 Meter Relays

Meter relays can be used for over-voltage and/or over-current protection. When an over-voltage and/or over-current meter relay is used as protective device, the corresponding indicator lamp lights when the preset level of the meter is reached. The high voltage will shut off thus protecting the load from excessive current or voltage. On motorized systems, when a relay is used for pre-selection and the preset limit is attained, the high voltage will rise no further.

2.3.2 Line Reactor

Provides a front panel switch which puts a line reactor in series with the HV Transformer and by-passes the overload circuit. The line reactor limits output current to rated current of the power supply. It is useful in capacitor charging applications and other situations where a constant current is desired rather than a constant voltage.

2.3.3 Dwell Timer

Unless provided as part of the automatic circuit this will be provided as a timer that can be switched on or off manually and after timing out will sound a buzzer.

Note: this option alone does not provide any automatic function.

2.3.4 Memory KV Meter

This extra meter is provided to "remember" at which voltage the test sample has failed. It is normally used in motorized units only.

2.3.5 High Voltage Warning Circuit

Provides terminals inside control console which when HV is on will provide 250 VA at 115 V, turning on and off approximately every 1-2 seconds. Lights hooked up to these terminals will flash on and off, to warn of the presence of high voltage.

2.3.6 Motorized Output Control

2.3.6-A MANUAL—Single Speed

Along with standard HV ON and OFF pushbuttons, an OFF ZERO lamp and RAISE and LOWER pushbuttons are provided. The RAISE or LOWER pushbutton must be held down in order to keep the motor going up or down. The exception to this is in the case of a failure, in which the HV will be disconnected and the motor will automatically drive the variable transformer back to zero at the same speed as it went up. All 50 kW units have this feature as standard.

2.3.6-B MANUAL—10:1 Speed

Same as above except the speed specified as the fastest speed available can be varied to 1/10 of that fastest speed, e.g., 60 kV unit, 60 second motor, fastest rate of rise will be 1 kV per second. Slowest will be 100 V per second. In case of failure the HV will be disconnected and the motor will drive the variable transformer to zero at the fastest speed.

2.3.6-C AUTOMATIC—Single Speed

Units with this option can be operated in either the manual or automatic mode. In the automatic mode, when the HV ON button is depressed the voltage will ramp up at the specified rate of rise, stop at the pre-set voltage (set on meter relay provided) and dwell for the amount of time set on the timer. Then the voltage will ramp down to zero and HV will shut off. In the case of a failure, the HV will shut off and the motor will drive the variable transformer to zero.

2.3.6-D AUTOMATIC—10:1 Speed

Same as above except adjustable rate of rise.

2.4 SPECIFICATIONS

2.4.1—Input:	115 V ac, 50/60 Hz, 12A
2.4.2—Output:	100 kV @ 10 mA dc
2.4.3—Polarity:	Reversible
2.4.4—Duty:	Continuous
2.4.5—Ripple:	2% rms
2.4.6—Regulation:	15% NL-FL
2.4.7—Kilovolt Meter:	0-30/60/120 kV dc
2.4.8—Current Meter:	0-2.5/5/10 mA dc

2.5 PHYSICAL DATA

2.5.1—Controls	
Width:	19" (483 mm)
Depth:	9 3/4" (248 mm)
Height:	12 1/4" (311 mm)
Weight:	35 lbs. (16kg.)
2.5.2—HV Tanks (2 Unit Models Only)	
Width:	10"
Depth:	15"
Height:	20 1/4"
Weight:	150 lbs.