



Series 65 DC-DC Converters
Model 65 PS24DC
Model 65 PS48DC
and Model 65 PS120DC

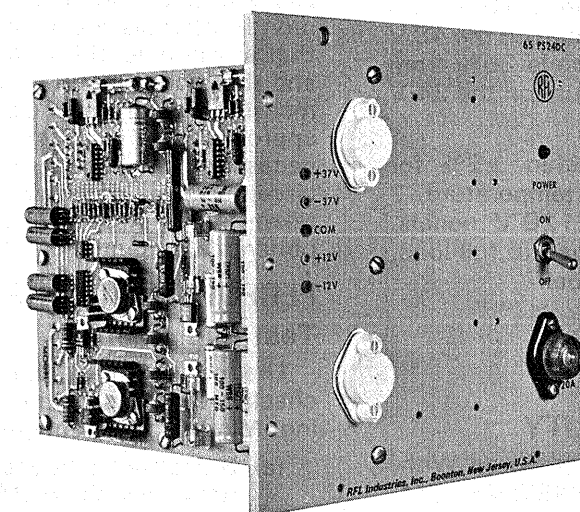


Figure 1. Typical Model 65 PS-DC Power Supply.

DESCRIPTION

The Model 65 PS-DC DC-DC Converter is designed to provide all power requirements for one complete terminal of a Series 65 Single-Sideband Carrier System. A complete terminal includes circuits for automatic-gain control, synchronization, compander, modulator and demodulator, upconverter, downconverter, signaling, data, preamplifier, and 40-watt output amplifier.

Three models are available; Model 65 PS24DC, designed to operate from a primary-power source of nominal 24 Vdc (21 - 28 Vdc), Model 65 PS48DC, which is designed to operate from a primary-power source of nominal 48 Vdc (43 - 56 Vdc), and the Model 65 PS120DC for use with a primary source of nominal 120 Vdc (108 - 138 Vdc). The outputs of the power supplies are plus and minus 37 Vdc, and plus and minus 12 Vdc. All four outputs are rated for 2.0 amperes, on the 48 V and 120 V models, and 1.4 amperes on the 24 V model.

Principles of operation of the Model 65 PS-DC are outlined in the block diagram, Figure 2. An 800-Hz oscillator, powered by the dc supply, excites the primary of a power transformer having multiple secondaries. The two 37-volt outputs are not regulated, and the 12-volt outputs are regulated.

The 37-volt supply is provided with overcurrent sensing circuits which will shut down the supply in the event of overload. This circuit also generates a logic pulse which is transmitted to the Model 65 PWRAMP to disconnect its load when the condition of overcurrent is sensed. The 12-volt supplies are protected for both overvoltage and overcurrent. Failure of any of the four power sources will cause a relay to drop out, the contacts of which may be used to set an alarm.

Surge protection provided complies with-ANSI/IEEE STD. C37.90 - 1978.

The height of the Model 65 PS-DC is 8.75 inches (222 mm). This corresponds to the height of a standard 19-inch (482 mm) relay-rack panel using five standard rack units. The width of the power supply is precisely one-half the width of the relay-rack panel. The size of the Model 65 PWRAMP, with which this power supply is used, is identical, so that when the two units are bolted together they form a single unit occupying the space of a standard 8.75-inch relay-rack panel. A power supply will operate one power amplifier plus the associated system. When more than one power amplifier is used, amplifiers and their power supplies may be bolted together and positioned on the relay rack in any convenient arrangement.

65 PS24DC/65 PS48DC/65 PS120DC



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SPECIFICATIONS

INPUT

Model 65 PS24DC: 21 to 28 Vdc, 12 A max.
Model 65 PS48DC: 43 to 56 Vdc, 6.0 A max.
Model 65 PS120DC: 108 to 138 Vdc, 2.5 A max.

INPUT-CURRENT RIPPLE

Current taken by the power supply from a source of zero internal impedance is modulated at a level of 200 mA peak-to-peak.

OUTPUT

37-volt outputs follow line-voltage changes proportionally. Output-voltage regulation is 10% from no load to full load, 2 amperes maximum on the 48 V and 120 V models. Output regulation is 25% from no load to full load, 1.4 amps maximum on the 24 V model.

12-volt outputs are regulated within $\pm 2\%$ for changes in input voltage, load, and temperature, 2 amperes maximum on the 48 V and 120 V models. Output regulation is 25% from no load to full load, 1.4 amps maximum on the 24V model.

OUTPUT NOISE

37-volt outputs: 1.0 Vp-p maximum.
12-volt outputs: 0.5 Vp-p maximum.

SURGE-WITHSTAND CAPABILITY

Complies with ANSI/IEEE Guide for Surge Withstand Capability (SWC) Tests, ANSI/IEEE Std. C37.90 - 1978. Dielectric strength between input and chassis and between input and output is 3 kV.

OPERATING AMBIENT-TEMPERATURE RANGE

0 to 45 °C within specifications,
-20 to 60 °C operating range.

SIZE AND WEIGHT

The power supply alone is 8.75 inches high by 9.5 inches wide by 2.25 inches deep (222 x 241 x 57 mm). When bolted together with its companion amplifier, the width of the assembly is exactly 19 inches (482 mm), the width of a standard relay-rack panel.

Weight of the power supply alone (48 V and 120 V models) is 8.5 lbs., (3.86 kg). Weight of the 24 V model alone is 9.125 lbs. (4.14 kg).

Series 65 DC - DC Converters	Nominal 24-Vdc Input HB-48230-3		
	Nominal 48-Vdc Input HB-48230-1		
	Nominal 48-Vdc Input HB-48230-2		
65 PS 24 DC	•		
65 PS 48 DC		•	
65 PS 120 DC			•

INSTALLATION

When supplied by RFL as a unit of a complete Series 65 Single-Sideband Carrier System, the power supply will be installed and interconnected as part of the system, and no special procedures should be necessary. Primary dc-input power is connected at Terminals 4 and 5 of J1. Terminal 5 is the positive side.

MAINTENANCE

GENERAL

Routine maintenance of the system is effected easily through periodic check of voltage levels. Six-month intervals are suggested. It is recommended that at the time of installation all levels be recorded and the record retained for future reference. Levels measured at times of periodic maintenance should approximate those first recorded. If it becomes necessary to effect a significant adjustment of the circuit element determining the level, this should be taken as an indication of incipient failure. Major components are identified in Figure 3.

PERFORMANCE CHECKS

Test Equipment

The operation of the dc-dc converter may be checked by using the procedures listed in the following. Minimum test equipment required is:

- Suitable adjustable dc-power source, nominally either 24, 48, or 120 Vdc, according to the model under test.
- DC voltmeter with 0.1 % accuracy, Tektronix DM-502, or equal.
- Power resistors: two each 25 ohms, 100 watts; two each 6 ohms, 50 watts, and two 8.5 ohms, 50 watts (for 24V- model only).
- DC ammeter with maximum current range of at least 5 amperes. Simpson Model 260, or equal.
- An oscilloscope capable of reading at least 200 volts, peak-to-peak, and period as short as 1 ms.
- Power decade-resistance box, Clarostat 240-C, or equal.

Oscillator Test

- Adjust the output voltage of the dc power supply for the minimum of the input-voltage range of the converter, either 21, 43, or 108 Vdc.
- Connect oscilloscope between TP101 and TP102.
- Turn on power and observe waveform. A squarewave should be observed with an amplitude of approximately 39 Vp-p for 21-volt input, 85 Vp-p for 43-volt input, or 200 Vp-p for 108-volt input. The period of the squarewave should be between 0.7 and 1.5 ms.
- Repeat the foregoing test with the oscilloscope connected between TP101 and TP103.

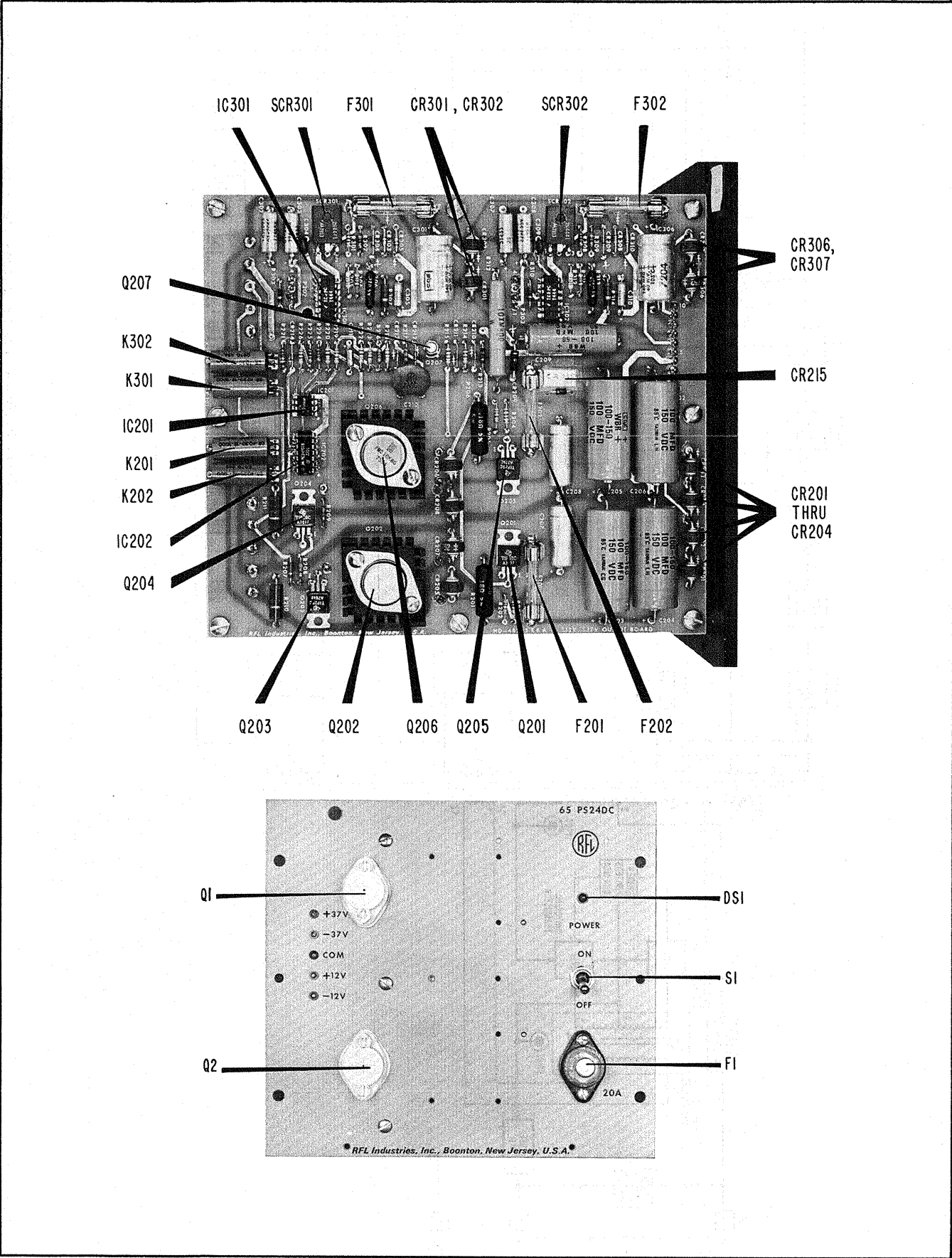


Figure 3. Identification of major components.

Circuit Symbol	Description	RFL Part Number
R101	For 24-volt models: Resistor, wirewound, 500 ohms, 5%, 12W, Ohmite 1730, or eq. . . .	H-1100-208
	For 48-volt models: Resistor, wirewound, 800 ohms, 5%, 10W, Ward-Leonard 10X7, or eq.	H-1100-175
	For 120-volt models: Resistor, wirewound, 2000 ohms, 5%, 20W, Ohmite 1827, or eq. . .	H-1100-359
R102, 103	For 24-volt models: Resistor, wirewound, 30 ohms, 5%, 5W, Ohmite 4573, Style 995-5B, or eq.	H-1100-512
	For 48- and 120-volt models: Resistor, wirewound, 12 ohms, 5%, 5W, Ohmite 4563, Style 995-5B, or eq.	H-1100-714
R210, 211	Resistor, fixed, composition, 2.2K ohms, 5%, 1W, Allen Bradley GB, or eq.	H-1008-180
R105-109	Not used	
R110, 111, 116, 117	Resistor, fixed, composition, 6.8 ohms, 10%, 1W, Allen Bradley CB, or eq.	H-1009-690
R112, 115	Resistor, metal-film, 221 ohms, 1%, ¼ W, Stackpole Components Type RN¼, or eq.	H-0410-1225
R202-205, 207-209, 213-226, 301-303, 308-310	Resistor, fixed, composition, 5%, ¼ W, value on schematic, Allen Bradley CB, or eq.	H-1009-(xxx)
R113, 114	For 24-volt models: Resistor, wirewound, 0.05 ohm, 5%, 5W, Gamble CG-8, or eq.	H-1100-750
	For 48-volt models: Resistor, wirewound, 0.12 ohm, 5%, 5W, Gamble CG-8, or eq.	H-1100-707
	For 120-volt models: Resistor, wirewound, 0.25 ohm, 5%, 5W, Gamble CG-8, or eq.	H-1100-713
R118	Not used	
R119	Resistor, wirewound, 1 ohm, 5%, 3.25W, Ohmite 4330, Style 995-3A, or eq.	H-1100-361
R120, 121	For 48- and 120-volt models: Resistor, fixed, composition, 27 ohms, 5%, 1W, Allen Bradley GB, or eq.	H-1009-929
R201, 206	Resistor, wirewound, 0.18 ohm, 5%, 5W, Gamble CG-8, or eq.	H-1100-708
R212	Resistor, wirewound, 800 ohms, 5%, 10W, Ward-Leonard 10X7, or eq.	H-1100-175
R225, 301, 308	Resistor, metal-film, 100 ohms, 1%, ¼ W, Stackpole Components, Type RN¼, or eq.	H-0410-1192
R304, 311	Resistor, metal-film, 4.87K, 1%, 1/8W, Type RN55D, RFL Spec HA-38301	H-1510-731
R305, 312	Resistor, metal-film, 7.15K, 1%, 1/8W, Type RN55D, RFL Spec HA-38301	H-1510-1533
R306, 313	Resistor, wirewound, 0.22 ohm, 5%, 3W, Gamble CG-6, or eq.	H-1100-709
R307, 314	Resistor, fixed, composition, 1.2K, 5%, 0.5W, Allen Bradley EB, or eq. .	H-1009-449
R315	Resistor, metal-film, 2.7K ohms, 1%, ½ W, Stackpole Components, Type RN½, or eq.	H-0410-2330
S1	Switch, toggle, 20 amp., 250V, Cutler-Hammer 7402-K4 with low-temp lube, or eq.	HA-29374