Section 1

Introduction & Specifications

1-1. INTRODUCTION

1-2. The Model 4265A is a programmable, bipolar dc voltage source. Output voltage is from 0 to 65.532 vdc in two ranges; 16 and 65 vdc. Programming resolution using the internal reference voltage is 1 mv on the 16 volt range and 4 mv on the 65 volt range. Output accuracy is ±.01% of the programmed level on both voltage ranges. After a 100 μsec settling time, a READY/NOT READY FLAG indicates that the output has settled to ±.01% of the programmed increment for a resistive load. The output current is rated at ±1 ampere maximum and is limited to approximately ±1.1 ampere in the event of an overload or short circuit. The sink current (milliamps) is rated at 1000-10 E_{OUT} maximum. A Programmable Current Limiter (Option –06) is available to allow programming the maximum output current to a lower level. A current limit flag indicates when a sink or source current overload exists with or without the –06 Option.

1-3. Programming requirements are compatible with DTL or TTL logic levels. Contact or relay closures can also be used. The voltage source is programmed on the low range using straight binary coding. The high range is also programmed in the same manner, but the actual output is four times the programmed level. Two's complement coding is required for negative outputs when the Isolated Control Logic (–01 Option) is installed. All programming inputs and flag outputs are available through a 50 pin Amphenol, Blue Ribbon connector located on the rear panel. A +5 vdc output is also available at this connector and is used to provide power for external programming circuitry. Negative logic is employed for programming. The logic levels are as follows:

Logic "0" = +2.0 vdc to +5.0 vdc or open circuit
Logic "1" = 0 to +0.4 vdc or short circuit to LOGIC GRD.

1-4. Three options are available to provide tailoring of the power supply to fit application requirements. These options are identified by numeric designations –03, –06, and –09. A description of each option is provided in Table 1-1. These options may be installed at the factory when the instrument is ordered or in the field at a later time.

1-5. Physically, the power source is completely solid state. Plug in printed circuit boards, with easy to reach test points and adjustments, are used for ease in servicing. The unit is forced air cooled. This results in lower component temperatures and thus higher reliability than would normally be obtained in a source of this power capability. The chassis is designed for bench top use, or it can be installed in a standard equipment rack by using the Accessory Rack Mounting Fixtures.

Table 1-1. OPTIONS

OP-TIONS	TITLE	DESCRIPTION
–01	ISOLATED CONTROL LOGIC (Now Standard)	Separates the external digital interface logic and attendant noise from the Model 4265A analog circuitry. Impedance between the interface logic and the analog circuitry is greater than 10^9 ohms, in parallel with 3 pf. It also provides a data storage that allows multiplexing of several voltage sources from one system interface register or data bus. Two's complement binary coding is required for negative outputs.
–02	FRONT PANEL DISPLAY (Now Standard)	Lamps (light emitting diodes) installed on the front panel which indicates the programmed VOLTAGE LEVEL, SIGN, CURRENT LIMIT, EXT REF, POWER ON, and STDBY conditions.
–03	EXTERNAL REFERENCE (Field Installable)	Allows the use of an external signal source in place of the internal reference voltage. Any dc or ac signal can be used that has an amplitude from 0 to ±14.5 volts and a frequency from dc to 30 kHz. Input impedance is 100K, in parallel with 70 pf.
–04	DIRECT COUPLED CONTROL LOGIC (No Longer Available)	The Direct Coupled Control Logic is no longer offered as an option to the 4200 series instruments. The Isolated Control Logic (see description above) is now standard equipment on all instruments.
–05	BLANK FRONT PANEL (No Longer Available)	The Blank Front Panel is no longer offered as an option to the 4200 series instruments. The Front Panel Display (see description above) is now standard equipment on all instruments.
–06	PROGRAMMABLE CURRENT LIMITING (Field Installable)	Programmable current limit is provided in two ranges, 100 ma and 1 ampere. Each range may be programmed in 10% increments from 10% to 110% of range.
–09	MULTI-STROBE ISOLATED LOGIC (Field Installable)	Permits any of the Fluke 4200 series Programmable Voltage Sources to be remotely controlled by a large variety of program sources such as a computer, a system coupler, as well as a Fluke Automatic Test Equipmetn System. Refer to Section 6 for details.

1-6. SPECIFICATIONS

OUTPUT VOLTAGE . . . . . 0 to ±16.383 vdc
0 to ±65.532 vdc
(Maximum output terminal voltage = ±66v minimum)

OUTPUT VOLTAGE RESOLUTION . .
16v Range . . . . . 1.0 mv
65v Range . . . . . 4 mv
(Provisions have been made to allow changing of the MSB weight to 8000 and 32000 mv by installation of a jumper in the Preamplifier.)

OUTPUT CURRENT	0 to ±1 ampere (Short circuit protected at 1.1 ampere)
CURRENT SINK CAPABILITY	I_{SINK} (ma) = 1000 − 10 E_{OUT} (Overload protected) The Current Limit Flag is energized when a current sink overload condition occurs.
ACCURACY (15°C to 35°C, 90 days)	
16v Range	±(0.01% of program +100 uV)
65v Range	±(0.01% of program +300 uV)
STEADY STATE RIPPLE AND NOISE (10 Hz to 10 MHz bandwidth) 16v Range	500 uV rms 7mV p-p
65v Range	1 mV rms 7mV p-p
OUTPUT IMPEDANCE	0.02 milliohms @ dc; 1 ohm @ 30 kHz
EXTERNAL REFERENCE (Option −03)	
Voltage Range	0 to ±14.5 VDC or peak ac
Input Impedance	100k ohms in parallel with 70 pf
Output Voltage	
16v Range	0 to 12v rms, 17V peak
65v Range	0 to 46v rms, 66V peak
Output Current	707 ma rms, 1.0 amp peak
Frequency Range	dc to 30 kHz
Accuracy (15°C to 35°C, 90 days with respect to the External Reference, E_{XR}) 16v Range	±(0.01% of program +.0001%$\left(\frac{75}{E_{XR}}\right)$ +100 uV) at dc.
65v Range	±(0.01% of program +.0001%$\left(\frac{75}{E_{XR}}\right)$ +300 uV) at dc.
Programming Resolution (Least significant bit)	
16v Range	$E_{XR} \times 10^{-4}$ volts
65v Range	$E_{XR} \times 4 \times 10^{-4}$ volts
PROGRAMMABLE CURRENT LIMIT (Option −06)	
100 ma Range	±10 mA to ±110 mA in 10 mA increments
1 amp Range	±100 mA to ±1.1 amp in 100 mA increments
Minimum program possible	±10 mA
SPEED	Settles to 0.01% of the programmed change in 100 μsec. A range change does not increase settling time.
OUTPUT STABILITY (Constant load, line and temperature)	
16v Range, 24 hours	±(10 ppm of program + 40 uv)
90 days	±(30 ppm of program + 70 uv)
65v Range, 24 hours	±(10 ppm of program +120 uv)
90 days	±(30 ppm of program +210 uv)
TEMPERATURE COEFFICIENT (35°C to 15°C)	
16v Range	±(10 ppm of program +15 uv) per °C
65v Range	±(10 ppm of program +15 uV) per °C
LOAD REGULATION	An output current change of 1 ampere causes the output voltage to change less than 0.001% of range.
LOAD RECOVERY	The output voltage will settle to within 0.01% of final value in 100 μsec after an output current change of 1 amp.

LINE REGULATION	The output voltage will change less than 0.001% of range for a ±10% change in line voltage.
OUTPUT TERMINALS	HIGH, LOW, HIGH SENSE, LOW SENSE, CHASSIS, GUARD. Terminals located on rear panel. The GUARD terminal can be floated up to 1000 volts above chassis ground.
PROGRAM CONTROL CONNECTOR (See Table 1-3)	A 50 pin connector on rear panel. Mating connector is Amphenol, Blue Ribbon, Part No. 57-30500.
INPUT POWER	115/230 vac ±10%, 48–62 Hz single phase, 200 watts fully loaded.
ENVIRONMENTAL	
Temperature	0°C to 50°C operating; –40°C to 75°C storage.
Relative Humidity	0 to 80%
Shock	20g, 11 millisecond half-sine wave
Vibration	4.5g, 10–55 Hz
Altitude	0 to 10,000 ft - Operating 50,000 ft – Non-operating
SIZE (See Figure 1-1)	5–1/4" high x 17" wide x 19–7/8" (max) deep
ACCESSORIES	
Manual Control Unit	Allows manual checkout, calibration, and control. FLUKE Model A4200.
Rack Mounting Brackets	M05-205-600
Chassis Slides	M00-260-610 (18") M00-280-610 (24")
Mating Connector	Amphenol, Blue Ribbon 57-30500, FLUKE PART NO. 266056.
Extender Card	FLUKE PART NO. 292623

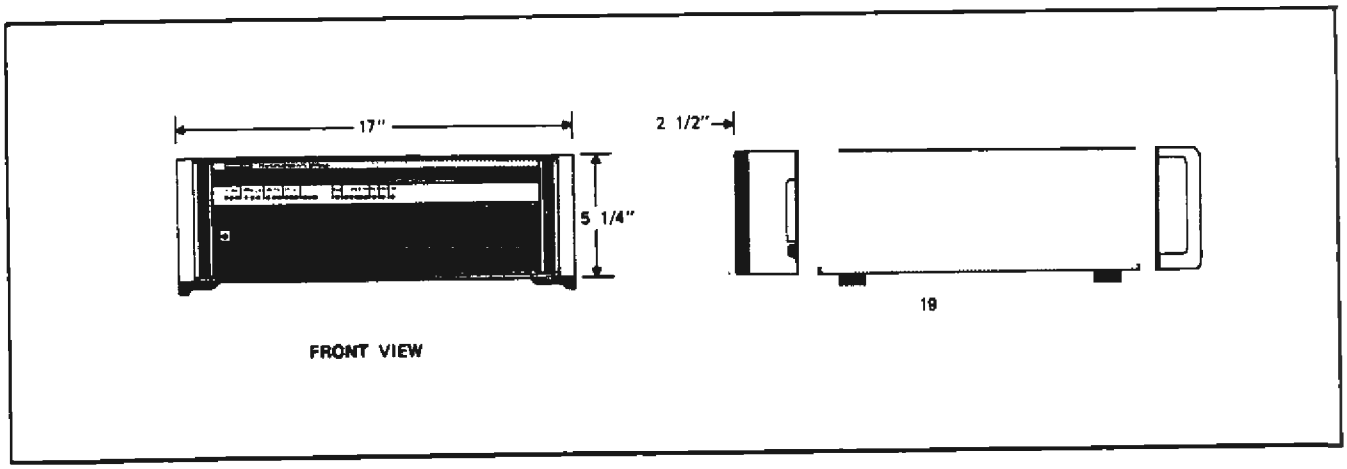

Figure 1-1. OUTLINE DRAWING

Table 1-2. PROGRAMMING INPUT/OUTPUTS

PROGRAM CONTROL	All program control and response lines are compatible with DTL and TTL logic. Programming lines are brought out on the rear panel.
LOGIC LEVELS	Logic "1" = 0 ±.4 vdc or contact closure; Logic "0" = +2 to +5 vdc or open circuit
SIGN	Connector Pin 35; Logic "1" = Negative output voltages
MAGNITUDE	Bit Wt. / Conn. Pin: 2^{13} 1; 2^{12} 2; 2^{11} 3; 2^{10} 4; 2^{9} 5; 2^{8} 6; 2^{7} 7 Bit Wt. / Conn. Pin: 2^{6} 8; 2^{5} 9; 2^{4} 10; 2^{3} 11; 2^{2} 12; 2^{1} 13; 2^{0} 14 *Two's complement binary coding for negative values is used with the Isolated Control Logic Option –01. Sign and magnitude binary coding is used with the direct coupled control logic Option –04.*
DATA STROBE	Connector pin 33. When using the Isolated Control Logic, a strobe pulse is required to start the digital-to-analog conversion process after a valid command is present. Minimum pulse width is 500 nanoseconds. A negative leading slope (+5V to 0V transition) is required. Upon release of the Data Strobe, the output will go to the programmed value. If the Data Strobe is not used in the Direct Coupled mode, the output will follow any command data perturbations. Logic "1" = "hold" condition.
RANGE	Connector Pin 29; Logic "0" = Low Voltage Range, Logic "1" = High Voltage Range.
EXTERNAL REFERENCE	Connector Pin 36; Logic "0" = Internal DC Reference, Logic "1" = External Reference.
STANDBY	Connector Pin 34; Logic "0" = Operate Mode, Logic "1" = Standby; Output is approximately 1% of programmed level.
CURRENT LIMIT	Connector Pin / Function / Logic "1" / Logic "0" 42 / Range / 1 Amp / 100 mA 43 / Magnitude / 80% of Range / 0 / All "0"'s = 44 / Magnitude / 40% of Range / 0 / 10% of range 45 / Magnitude / 20% of Range / 0 46 / Magnitude / 10% of Range / 0
RESPONSE SIGNALS	
CURRENT LIMIT FLAG	Connector Pin 49; Logic "1" represents a current overload condition.
READY/NOT READY FLAG	Connector Pin 37; Logic "0" = "Ready" condition; the output is within 0.01% of the programmed increment for a resistive load. Logic "1" = "Not Ready" condition; the power source is in the process of settling to the programmed value.
POWER CONNECTIONS	Connector Pin 25; An internal, isolated power supply furnished +5 vdc, current limited by 2.7 ohms, for use by the external system interface logic.
LOGIC GROUND	Connector Pins 17 thru 24; It is recommended that a large ground strap be used between the interface logic and the power source to reduce the digital programming noise on the system ground.