5315A/B 5316A Specifications

Input Characteristics (channel A and channel B)

**Range:** dc coupled 0 to 100 MHz.

- ac coupled 30 Hz to 100 MHz.

**Sensitivity:** 10 mV rms sine wave to 10 MHz.

- 25 mV rms sine wave to 100 MHz.

- 75 mV peak-to-peak pulse at minimum pulse width of 5 ns.

Sensitivity can be varied continuously up to 500 mV rms NOMINAL by adjusting sensitivity control. In sensitivity mode, trigger level is automatically set to 0 V NOMINAL.

**Dynamic Range**

- 30 mV to 5 V peak-to-peak, 0 to 10 MHz.

- 75 mV to 5 V peak-to-peak, 10 to 100 MHz.

**Coupling:** ac or dc, switchable.

**Filter:** low pass, switchable in or out of Channel A. 3 dB point of 100 kHz NOMINALLY.

**Impedance:** 1 MΩ NOMINAL shunted by less than 40 pF. 500 KΩ NOMINAL shunted by less than 70 pF (COMMON A).

**Signal operating range:** +2.5 Vdc to −2.5 Vdc.

**Attenuator:** X1 or X20 NOMINAL.

**Trigger level:** variable between +2.5 Vdc and −2.5 Vdc.

**Slope:** independent selection of + or − slope.

**Common input:** all specifications are the same for Common A except the following:

- **Sensitivity:** 10 mV rms sine wave to 10 MHz; 25 mV rms sine wave to 50 MHz; 50 mV rms to 100 MHz; 150 mV peak-to-peak at a minimum pulse width of 5 ns.

**Dynamic range:** 30 mV to 5 V peak-to-peak to 10 MHz; 75 mV to 5 V peak-to-peak, 10–50 MHz; 150 mV to 5 V peak-to-peak, 50–100 MHz.

**Impedance:** 500 kΩ NOMINAL shunted by less than 70 pF.

**Damage Level**

- ac & dc × 1:
  - dc to 2.4 kHz: 250 V (dc + ac rms)
  - 2.4 kHz to 100 kHz: 6 × 10^5 V rms Hz/FREQ
  - >100 kHz: 6 V rms

- ac & dc × 20:
  - dc to 28 kHz: 500 V (dc + ac peak)
  - 28 kHz to 100 kHz: 1 × 10^6 V rms Hz/FREQ
  - >100 kHz: 100 V rms

**Frequency (channel A)**

**Range:** 1 Hz to 100 MHz.

**LSD displayed:** 10 Hz to 1 Hz depending upon gate time and input signal. At least 7 digits displayed per second of gate time.

**Period**

**Range:** 10 ns to 10^6 s.

**LSD displayed:** 100 ns to 1 s depending upon gate time and input signal. At least 7 digits displayed per second of gate time.

**Time Interval**

**Range:** 100 ns to 10^6 s.

**LSD displayed:** 100 ns.

**Time Interval Average**

**Range:** 0 to 10^6 s.

**LSD displayed:** 100 ns to 10 ps depending upon gate time and input signal.

**Number of intervals averaged (N):** N = Gate Time x FREQ.

**Minimum dead time (stop to start):** 200 ns.

**Time Interval Delay (holdoff)**

Front panel gate time knob inserts a variable delay of NOMINALLY 500 µs to 30 ms between START (Channel A) and enabling of STOP (Channel B). Electrical inputs during delay time are ignored. Delay time may be digitally measured by simultaneously pressing T.I. Averaging, T.I. Delay and blue key.

**Ratio**

**Range:** 0.1 Hz to 100 MHz, both channels.

**LSD:** 2.5 x Period A x Ratio. (rounded to nearest decade)

**Gate Time**

**Totalize**

**Manual**

**Range:** 0 to 100 MHz.

**A gated by B**

Totalizes input A between two events of B. Instrument must be reset to make new measurement. Gate opens on A slope, closes on B slope.

**Range:** 0 to 100 MHz.

**General**

**Standard Time Base**

**Frequency:** 10 MHz.

**Aging rate:** < 3 × 10^-7 /mo.

**Temperature:** ± 5 × 10^-5, 0° to 50°C

**Line voltage:** < 1 × 10^-5 for a ± 10% variation.

**Check:** counts internal 10 MHz reference frequency over gate time range NOMINALLY 500 µs to 30 ms.

**Error light:** LED warning light activated if logic error is found during instrument turn-on self-check.

**Display:** 8 digit amber LED display, with engineering units annunciator.

**Overflow:** only frequency and totalize measurements will overflow. In case of overflow, eight least significant digits will be displayed and amber front panel overflow LED will be actuated.

All other measurements which would theoretically cause a display of more than 8 digits will result in the display of the 8 most significant digits.

**Gate time:** continuously variable, NOMINALLY from 60 ms to 10 s or 1 period of the input, whichever is longer.

**Sample rate:** up to 7 readings per second NOMINAL except in time interval mode, where it is continuously variable NOMINALLY from 250 ms to 10 s via Gate Time Control.

**Operating temperature:** 0° to 50°C.

**Power requirements:** 100, 120, 220, 240 V (+5%, −10%) 48–66 Hz; 15 VA maximum or 30 VA maximum (5316A).

**Weight:** net, 3.2 Kg (7 lbs. 2 oz.). Shipping, 4.5 Kg (10 lbs.).

**Dimensions:** 238 mm W x 98 mm H x 276 mm D (9¾" x 3¾" x 10¾").

Additional 5315B Specifications

Rack and stack metal case with rear panel, switchable AC power line module. Specifications same as 5315A except as follows:

**Rack mount:** 5061–0072 recommended.

**Oscillator output:** 10 MHz, 50 mV pk-pk into 50 Ω load, on rear panel.

**External frequency standard input:** 10 MHz, 1 V RMS into 500 Ω, on rear panel.

**Dimensions:** 212 mm W x 88 mm H x 345 mm D (8¾" x 3½" x 13¾").

**Weight:** net, 2.2 Kg (4 lbs. 12 oz.). Shipping, 4.1 Kg (9 lbs.).
Additional 5316A Specifications

- Rack and stack metal case with rear panel, switchable ac power line module, Specifications same as 5315A except as follows:
- **Rack mount kit**: 5061-0072 recommended.
- **Oscillator output**: 10 MHz, 50 mV p-p into 50 Ω load on rear panel.
- **External frequency standard input**: 1, 5, 10 MHz, 500 mV rms into 500 Ω, or rear panel.
- **Trigger level output**: ±5%, ±15 mV, over ±2.0 VDC range at front panel connectors.
- **Dimensions**: 212 mm W × 88 mm H × 415 mm D (8 3/8 × 3 1/2 × 16 1/2")
- **Weight**: net, 3.9 kg (8 lbs. 10 oz.). Shipping, 6.3 kg (14 lbs.)

Hewlett-Packard Interface Bus

- **Programmable functions**: Frequency A, Frequency A Armed by B, Totalize, A Gated by B, Ratio A/B, Time Interval Average A-B, Time Int. Delay, Read Gate Time, Display Test, 10 MHz Check, Interface Test, Initialize, Reset, Wait State ON/OFF.
- **Programmable controls**: Gate Time Command which sets long (60 ms to 10 s) or short (500 μs to 30 s) range; Trigger Level Commands which set Channel A and/or B slope (±) and Channel A and/or B trigger from 2.50 VDC to +2.50 VDC in steps of .01 V.
- **Interface functions**: Group Execute, Trigger, Device Clear, Selected Device Clear, Interface Clear, Local, Remote, Local Lockout, Read Status (serial poll enable), Request Service.

Options

- **Opt. 001: High Stability Time Base (TCXO)**
  - **Frequency**: 10 MHz.
  - **Aging rate**: < 1 × 10⁻⁷/mo.
  - **Temperature**: ±1 × 10⁻⁶, 0° to 40°C.
  - **Line voltage**: < 1 × 10⁻⁴ for ±10% variation.
- **Opt. 002**: battery (5315A only)
  - **Type**: rechargeable lead-acid (sealed).
  - **Capacity**: TYPICALLY 4 hours of continuous operation at 25°C.
  - **Recharging time**: TYPICALLY 16 hours to 98% of full charge, instrument non-operating. Charging circuitry included with Option. Batteries not charged during instrument operation.
  - **Low voltage indicator**: instrument turns itself off automatically when low battery condition exists. **Discharge** LED flashes slowly when this happens. **Discharge** LED is on whenever battery is supplying power to instrument.
  - **Charge** LED indicates state of charge of battery during charging only and is on whenever battery is charged to 95% NOMINAL of capacity. **Charge** LED flashes when 90% **NOMINAL** of charge taken out is replaced. **Charge** LED is off if charge is less than 70% **NOMINAL** of capacity.
  - **Line failure protection**: instrument automatically switches to battery in case of line failure.
  - **Weight**: Opt. 002 adds 1.8 kg (4 lbs. 1 oz.) to instrument weight.
- **Option 003**: C Channel

Input Characteristics

- **Range**: 50 to 1000 MHz, prescaled by 10.
- **Sensitivity**: 15 mV rms sinewave (−23.5 dBm) to 650 MHz, 75 mV rms sinewave (−9.5 dBm) to 1000 MHz.
- **Sensitivity** can be decreased continuously by up to 20 dB **NOMINAL**, 50 to 500 MHz and 10 dB **NOMINAL**, 500 to 1000 MHz by adjusting sensitivity control. **Trigger level** is fixed at 0 V **NOMINAL**.
- **Dynamic range**: 15 mV to 1 V rms (36 dB), 50 to 650 MHz, 75 mV to 1 V rms (20 dB), 650 to 1000 MHz.
- **Signal operating range**: +5 V dc to −5 V dc.
- **Coupling**: ac
- **Impedance**: 50 Ω **NOMINAL** (VSWR, < 2.5:1 TYPICAL).
- **Damage level**: ±8 V (dc + ac peak), fuse protected. Fuse located in BNC connector.

Frequency (channel C)

- **Range**: 50 to 1000 MHz.
- **LSD displayed**: 100 Hz to 1 Hz depending upon gate time. At least 7 digits per second of gate time.

**Option 004**: High Stability OVEN Time Base (5315A only)

- **Frequency**: 10 MHz
- **Aging rate**: <3 × 10⁻⁷/mo.
- **Temperature**: ±1 × 10⁻⁶, 0° to 50°C.
- **Line voltage**: <1 × 10⁻⁴, for a 10% variation.

(5315B and 5316A)

- **Frequency**: 10 MHz
- **Aging rate**: <3 × 10⁻⁷/mo.
- **Temperature**: ±2 × 10⁻⁶, 0° to 50°C
- **Line voltage**: <1 × 10⁻⁴, for a 10% variation.

**Option 006**: Offset-Normalize Module

**Measurements** (X) **operated on**: Frequency, Period, Time Interval, Time Interval Delay, Ratio, and Check. Time Interval place holding zeros are not operated upon.

- **Modes**: Normalize (X/A), Offset (X + B), Normalize and Offset ((X/A) + B); switch selectable. Dividing by zero displays zero.
- **A and B value selection**: entered by thumbwheel switch with 8-digit mantissa and 1-digit exponent with sign. B may be positive or negative value.
- **Display**: 999.99999 × 10⁸ to <1 × 10⁻⁴ range. For negative numbers, the minus sign reduces resolution by one digit.
- **Overflow**: frequency measurements will overflow 3 decades after which LSD will be truncated.

- **Rack mount kit**: 5061-0074 recommended.
- **Weight**: option 006 adds 1.8 kg (4 lbs. 1 oz.) to instrument weight.

**Dimensions**

- **5315B plus option 006**: 425 mm W × 88 mm H × 345 mm D (16 3/4 × 3 1/2 × 16 1/2")
- **5316A plus option 006**: 425 mm W × 88 mm H × 415 mm D (15 3/4 × 3 1/2 × 16 1/2")

**Ordering Information**

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