

Specifications

	HP 86140A and HP 86143A	HP 86142A and HP 86145A
WAVELENGTH		
Range	600 nm to 1700 nm	600 nm to 1700 nm
Span Range (continuously variable)	0.2 nm to full range and zero span	0.2 nm to full range and zero span
Accuracy		
After calibration with internal wavelength reference signal ^a	± 0.025 nm (1510–1570), ± 0.035 nm (1570–1640)	± 0.025 nm (1510–1570), ± 0.035 nm (1570–1640)
After user calibration within ± 40 nm of calibration signal ^a	± 0.05 nm	± 0.05 nm
After user calibration over full wavelength range ^a	± 0.2 nm	± 0.2 nm
Absolute accuracy (2 year factory calibration cycle) ^a	± 0.5 nm	± 0.5 nm
Reproducibility , ≤ 1 minute ^b	± 0.003 nm	± 0.003 nm
Span Linearity ^{cd}	± 0.05 nm, for spans < 40 nm	± 0.05 nm, for spans < 40 nm
Span Linearity (1525 to 1570 nm) ^{cd}	± 0.02 nm	± 0.02 nm
Tuning Repeatability ^a	± 0.003 nm	± 0.003 nm
RESOLUTION BANDWIDTH (RBW)		
FWHM (selectable) ^{bc}	0.07, 0.1, 0.2, 0.5, 1, 2, 5, 10 nm	0.06, 0.1, 0.2, 0.5, 1, 2, 5, 10 nm
Corrected Resolution Bandwidth Accuracy (using noise markers) ^a		
≥ 0.5 nm, 1525 to 1610 nm	$\pm 4\%$	$\pm 3\%$
0.2 nm, 1525 to 1610 nm	$\pm 6\%$	$\pm 5\%$
0.1 nm, 1525 to 1610 nm	$\pm 12\%$	$\pm 10\%$

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AMPLITUDE		
Sensitivity^d		
600 to 750 nm (no averaging required) ^a	-60 dBm	-60 dBm
750 to 900 nm (no averaging required) ^a	-75 dBm	-75 dBm
900 to 1250 nm (no averaging required) ^a	-75 dBm	-75 dBm
1250 to 1610 nm (no averaging required) ^e	-90 dBm	-90 dBm
1610 to 1700 nm (no averaging required) ^b	-80 dBm	-80 dBm
Maximum Measurement Power		
1525 to 1700 nm	+15 dBm	+15 dBm
600 to 1000 nm	+15 dBm	+15 dBm
1000 to 1525 nm	+12 dBm	+12 dBm
Maximum Safe Power		
Total Safe Power	+30 dBm	+30 dBm
Total Power, within any 10 nm portion of the spectrum	+23 dBm	+23 dBm
Calibration Accuracy at -20 dBm, 1310 nm/1550 nm ^f	±0.5 dB	±0.5 dB
Scale Fidelity		
Autorange off, ≤0 dBm ^{ko}	±0.07 dB	±0.05 dB
Autorange on, ≤0 dBm ^{kg}	±0.1 dB	±0.07 dB
Display Scale (log scale)	0.01 to 20 dB/Div, -120 to +90 dBm	0.01 to 20 dB/Div, -120 to +90 dBm
Amplitude Stability (1310 nm/1550 nm)	±0.01 dB at 1 min ±0.02 dB at 15 min.	±0.01 dB at 1 min ±0.02 dB at 15 min.
Flatness		
1290 to 1330 nm ^{h,i}	±0.2 dB	±0.2 dB
1525 to 1570 nm ^{h,i}	±0.2 dB	—
1525 to 1610 nm ^{h,i}	—	±0.2 dB
1250 to 1610 nm ^{h,k,f}	±0.7 dB	±0.7 dB
Polarization Dependence^{h,j}		
1310 nm	±0.25 dB	±0.12 dB
1530 nm, 1565 nm	±0.2 dB	±0.05 dB
1600 nm	±0.25 dB	±0.06 dB
1250 to 1650 nm	±0.3 dB	±0.25 dB
1250 to 1650 nm (Option 025)	±0.4 dB	—

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DYNAMIC RANGE		
In 0.1 nm resolution ^{a,t}		
1250 to 1610 nm (chop mode on) at ± 0.5 nm, ± 1 nm, ± 5 nm	-70 dB	-70 dB
1550 nm at ± 0.8 nm (± 100 GHz at 1550 nm)	-60 dB	-60 dB
1550 nm at ± 0.5 nm (± 62.5 GHz at 1550 nm)	-55 dB	-58 dB
1550 nm at ± 0.4 nm (± 50 GHz at 1550 nm)	-52 dB	-55 dB
1550 nm at ± 0.2 nm (± 25 GHz at 1550 nm)	—	-40 dB
MONOCHROMATOR INPUT		
Input Return Loss		
Straight connector (9/125 μ m) ¹	>35 dB	>35 dB
PULSE MODE ACCURACY		
Turn On (≥ 2 μ s after rising edge)	< ± 0.2 dB (starting from dark)	< ± 0.2 dB (starting from dark)
Turn Off (≥ 10 μ s after falling edge)	< ± 0.2 dB	< ± 0.2 dB (30 dB extinction)
SWEEP		
Maximum Sweep Rate		40 nm/50 ms
Maximum Sampling Rate in Zero Span		50 μ s/trace point
Sweep Cycle Time		
50 nm span, auto zero off		< 180 ms
50 nm span, auto zero on		< 340 ms
100 nm span, auto zero on		< 400 ms
Full span, auto zero on		< 1 s
Sweep Cycle Time (30 nm span auto zero on)		
-80 dBm sensitivity ^d		1.8 s
-90 dBm sensitivity ^d		32 s
ADC Trigger Accuracy		
Jitter (distributed uniformly)		< ± 0.5 μ s
Trigger Delay range		2 μ s— 6.5 ms

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COMPUTER INTERFACING		
Remote Control		
Compatibility		IEEE-488.1, IEEE-488.2 (100%)
Interfaces		HP-IB, Parallel Printer Port, External VGA Monitor, Keyboard (PS/2) and Mouse
Floppy Disk		
Data Export		3.5 inch 1.44 MB, MS-DOS Spreadsheet and Word Processor Compatible (CSV ASCII)
Graphics Export		CGM
Instrument Drivers		Universal Instrument Drivers (PNP), Compatible with HP VEE, Labview, Visual Basic and C++

- a. With applied input fiber 9/125 μ m.
- b. Temperature range 20^o to 30^oC.
- c. Resolution of 10 nm is available in first order only.
- d. Sensitivity is defined as signal value >6 x RMS noise value.
- e. Temperature range 0^o to 30^oC.
- f. For resolution \geq 0.1 nm.
- g. Excluding amplitude errors at low power levels due to noise.
- h. Between 1350 nm and 1420 nm absorption of light by atmospheric moisture affects flatness.
- i. For resolution \geq 0.2 nm.
- j. At room temperature.
- k. Excluding multiple order grating response.
- l. Depends on the quality of the attached connector.

General Specifications

	HP 86140A and HP 86142A Benchtop	HP 86143A and HP 86145A Portable
Dimensions	222 mm H × 425 mm W × 427 mm D (8.8 in × 16.8 in × 16.8 in)	163 mm H × 325 mm W × 427 mm D (6.4 in × 12.8 in × 16.8 in)
Weight	16.5 kg (36 lb)	14.5 kg (31 lb)
Environmental	Operating: 0°C to 55°C; Storage: -40°C to 70°C Operating: < 95% RH; Storage: Non-condensing Up to 15,000 feet (4,572 meters) Conducted and radiated interference is in compliance with CISPR Publication 11, IEC 801-3, IEC 801-4, and IEC 555-2	
Power Requirements	Voltage and Frequency: 90 Vac to 260 Vac, 44 to 444 Hz Maximum Power Consumption: 230 W	

a. Floppy disk and printer operating temperature range 0°C to 45°C.

Option 004/005 EELED Sources

	HP 86140A and HP 86142A
Minimum Spectral Power Density^a	
1540 to 1560 nm (Option 005)	> -40 dBm/nm (100 nW/nm)
1470 to 1620 nm (Option 005)	> -60 dBm/nm (1 nW/nm)
1300 to 1320 nm (Option 004)	> -40 dBm/nm (100 nW/nm)
1540 to 1560 nm (Option 004)	> -40 dBm/nm (100 nW/nm)
1250 to 1620 nm (Option 004)	> -60 dBm/nm (1 nW/nm)
Return Loss	
With straight connector	> 25 dB
Stability (ambient temperature <±1°C)	
Over 15 minutes	< ±0.02 dB
Over 6 hours	< ±0.05 dB

a. Temperature range 0°C to 45°C.