

## Optical Variable Attenuator Comparison rev4 (Feb2022)

### Single mode attenuators

Specification	Meaning	KI 7010B	JDSU OLA-55	EXFO FVA-600	Noyes VOA6-SM
Calibration $\lambda$ Fiber type	More is Better	1310 / 1550 nm SMF-28	<b>1310 / 1550 / 1625 nm</b> <b>9/125 <math>\mu</math>m</b>	1310 / 1550 nm 9/125 $\mu$ m	1310 / 1490 / 1550 / 1625 nm 9/125 $\mu$ m
$\lambda$ range	Wider is better	<b>1200 to 1650 nm</b>	1260 to 1650 nm	1250 to 1625 nm	1260 to 1650 nm
Attenuation range	Wider is better	2.00 to 60.00 dB Max attenuation (Hi): > 60 dB Min attenuation (Lo): < 2 dB	2 to 60 dB	Max attenuation: 65 dB IL (exclude connectors): $\leq$ 1.5 dB	2.00 to 60.00 dB
Absolute loss uncertainty	Smaller is better	<b>0.5</b>	0.8 dB	Not Specified	0.8 dB @ 23 $\pm$ 2 $^{\circ}$ C
Linearity	Smaller is better	0.2	0.2 dB	0.1 dB only @ 23 $\pm$ 3 $^{\circ}$ C, 1310 nm $\pm$ 30, 1550 nm $\pm$ 40 nm	0.5 dB @ 23 $\pm$ 2 $^{\circ}$ C
Repeatability	Smaller is better	0.2	0.1 dB	0.1 dB Only @ 1550 nm $\pm$ 40 nm @ 23 $\pm$ 3 $^{\circ}$ C	0.2 dB @ 23 $\pm$ 2 $^{\circ}$ C
Resolution (dB)	Smaller is better	<b>0.05</b>	<b>0.05</b>	0.01	0.05
Insertion loss at low position	Smaller is better	< 2.00 dB	2 dB	1.5 dB under very restricted conditions	2.0 dB @ 23 $\pm$ 2 $^{\circ}$ C
Maximum input power	Bigger is better	<b>+30 dBm</b>	+ 23 dBm	+24 dBm	+20 dBm
$\lambda$ Flatness	Smaller is better	<b>Superior wavelength flatness</b> <b>-0.00015 dB/<math>\Delta</math>nm/dB Ideal for CWDM</b> <b>application</b>	Not specified	Not specified	Not specified
Return Loss (ORL)	Bigger is Better	> 45 dB typ, PC > 60 dB typ, APC dependent on external connector	Not specified	> 50 dB Only @ minimum IL, 1310 $\pm$ 1 nm, 1550 $\pm$ 1 nm, including connectors	> 45 dB typ dependent on external connector
Polarization Mode Dispersion (PMD)	Smaller is better	<b>&lt; 1 ps</b>	Not specified	Not specified	Not specified
Standard connector	More is better	<b>3 pairs of SC, LC, ST interchangeable</b> <b>connectors</b>	1 pair of connectors	1 interchangeable connector	FC interchangeable connector
Metal free connector <sup>1</sup>	Yes is better	<b>Yes</b>	No	No	No
Attenuation set speed		<b>Fast</b>	Very slow, direct manual operation only	<b>Fast</b>	Very slow, direct manual operation only
Thermal stability	Smaller is better	<b>0.02 dB over temperature</b>	Not Specified	Not Specified	Not specified
Attenuation stable at power on or off	Yes is better	<b>Yes</b>	<b>Yes</b>	Not Specified	<b>Yes</b>
Modern interchangeable optical connectors	More is better	<b>SC, FC, LC, ST, MU, FC, LSA, E2000, 2.5</b> <b>/ 1.25 mm universal</b>	SC, FC, ST, MU, LC, LSA, E2000,	SC, LC, FC, ST, LSA, E2000	SC, FC, ST
Power	Auto off is essential for field use.	AC power, 2 X C batteries. Selectable auto- off 10 minutes after last key press	AC charger, 4 x AA Alkaline batteries Selectable Auto off 20 minutes	AC adapter and rechargeable Li-ion battery Auto-off Not Specified	AC power, built-in Li-Ion battery. 10 min Auto-Off feature
Battery life with recommended cells	Longer is better	<b>200 ~ 600 hours</b>	> 300 hours	300 hours	100 hours
User automation programs	More is better	<b>15 user programs can be stored &amp;</b> <b>recalled</b>	No	No	No

Specification	Meaning	KI 7010B	JDSU OLA-55	EXFO FVA-600	Noyes VOA6-SM
Traceable calibration		ILAC/ISO 17025	No	No	No
Re-calibration cycle	Longer is better	3 years	3 years	3 years	1 year
Warranty	Longer is better	3 to 7 years	1 year	3 years	1 year
RS232 PC interface / External Software		PC Software	None	PC Software	None
Operating /storage temperature		-10 to 55 °C / -25 to 70 °C	-10 to 55 °C / -40 to 70 °C	-10 to 50 °C / -40 to 70 °C	-10 to 55 °C / -40 to 70 °C
Volume (cm <sup>3</sup> )		1012	1112	1178	1328
Weight (gm)		520	500	600	450
Standard accessories		3 pairs ST, LC, SC optical connector adaptors, ILAC/ISO 17025 traceable calibration certificate, PC software, RS232 cable, soft pouch and leather holster, operation manual, AA-to-C battery converters	1 pair interchangeable optical adapter, 4 dry AA-batteries, operating manual, belt-bag	User guide, Certificate of Calibration, quick reference sticker in five languages, AC adapter/charger, one connector adapter (EUI-XX), lithium ion battery, shoulder strap, semi-rigid carrying case, USB cable, instruction manual on CD	Protective rubber boot, AC adapter, Li-ion battery, battery charger, soft carry case

### Multi mode attenuators

Specification	Meaning	KI 702xB	JDSU OLA-54		
Calibration $\lambda$ Fiber	More is Better	850, 1300 nm	850, 1300 nm		
Type		50/125 or 62.5 $\mu$ m	50/125 $\mu$ m		
$\lambda$ range	Wider is better	700 ~ 1400 nm	750 ~ 1350 nm		
Attenuation range	Wider is better	3.0 ~ 60 dB	<2.5 ~ 55 dB		
Absolute loss uncertainty	Smaller is better	0.3 dB	0.8 dB (typical)		
Linearity	Smaller is better	0.1 dB	0.2 dB		
Repeatability	Smaller is better	0.1 dB	0.1 dB		
Resolution (dB)	Smaller is better	0.05	0.05		
Insertion loss at low position	Smaller is better	< 2.0 dB	< 2.5dB		
Maximum input power	Bigger is better	+ 30 dBm	+ 20 dBm		
$\lambda$ Flatness	Smaller is better	Superior wavelength flatness -0.0002 dB/ $\Delta$ nm/dB Ideal for CWDM application	Not specified		
Return Loss (ORL)	Bigger is Better	> 28dB typ, PC > 60 dB, APC dependent on external connector	Not specified		
Standard connector	More is better	3 pairs of SC, LC, ST interchangeable connectors	1 pair of connectors		
Metal free connector <sup>1</sup>	Yes is better	Yes	No		
Attenuation set speed		Fast	Very slow, direct manual operation only		
Thermal stability	Smaller is better	0.02 dB over temperature	Not specified		
Attenuation stable at power on or off	Yes is better	Yes	Yes		

Specification	Meaning	KI 702xB	JDSU OLA-54		
Modern interchangeable optical connectors	More is better	<b>SC, FC, LC, ST, MU, FC, LSA, E2000, SMA, 2.5mm universal</b>	SC, FC, ST, MU, LC, LSA, E2000, SMA		
Power	Auto off is essential for field use.	AC power, 2 X C batteries. Selectable auto-off 10 minutes after last key press	AC charger, 4 x AA Alkaline batteries Selectable Auto off 20 minutes		
Battery life with recommended cells	Longer is better	<b>200 – 600 hours</b>	> 300 hours		
User automation programs	More is better	<b>15 user programs can be stored &amp; recalled</b>	No		
Traceable calibration		<b>ILAC/ISO 17025</b>	No		
Re-calibration cycle	Longer is better	<b>3 years</b>	3 years		
Warranty	Longer is better	<b>3 to 7 years</b>	1 year		
RS232 PC interface / External Software		PC Software	None		
Operating /storage temperature		-10 to 55 °C / -25 to 70 °C	-10 to 55 °C / -40 to 70 °C		
Volume (cm <sup>3</sup> )		<b>1012</b>	1112		

Weight gm		520	500		
Standard accessories		3 pairs ST, LC, SC optical connector adaptors, ILAC/ISO 17025 traceable calibration certificate, PC software, RS232 Cable, soft pouch and leather holster, operation manual, C cell batteries & AA-to-C size battery converter	2 interchangeable optical adapter, 4 dry AA-batteries, operating manual, belt-bag		

Note 1: Kingfisher instrument is supplied with metal-free optical interchangeable connector adaptors, which avoid critical contamination of connectors used in high power application.

*Disclaimer: This comparison is based on our interpretation of published specifications. No liability is accepted for any inaccuracy. We would be pleased to amend anything found to be inaccurate.*