

# AA90x Series



## 90W Desktop Adapter Series



### Features

- US DoE Level VI Efficiency Compliance
- CoC Tier 2 Compliance
- OVP, OCP, SCP, OTP Protections
- Class B EMI
- Operating Altitude to 5,000 Meters

### Applications

- Networking Device
- Monitor
- Notebook
- Industrial Equipment

### Description

The single output 12VDC to 54VDC AA90x series AC/DC desktop adapters provide an output of 90 watts. Utilizing a 1,200mm to 1,500mm long output cable, the highly efficient power supplies feature an IEC 60320 C14 inlet as standard, are available with an IEC 60320 C8 inlet as special order and comply with the more demanding Level VII efficiency and no-load limits proposed by the US Department of Energy in February 2023<sup>3</sup> as well as those for Europe's voluntary Code of Conduct Version 5 Tier 2.

Approved for operation to +40 degrees C without derating and up to 5,000 meters altitude, the AA90x series power adapter meets  $\pm 8\text{kV}$  contact discharge and  $\pm 15\text{kV}$  air discharge ESD levels and Class B emissions limits and has UL, CE, UKCA, FCC, CAN ICES-3(B), and NRCan compliance approvals. The cost-effective, high-performance adapter is suitable for use in a wide range of consumer, enterprise, and industrial applications.

## AA90x Series

Specifications<sup>1</sup>

Model		AA90W-120B-R <sup>2,3</sup>	AA90U-120B-R <sup>3</sup>
Output	DC Output Voltage	12.0V	
	Max Current	7.5A	
	Output Power	90.0W	
	Regulation	± 5%	
	Ripple & Noise P-P(max) <sup>4</sup>	120mV	
Input	AC Input Voltage Range	90 to 264VAC	
	AC Input Voltage Rating	100 VAC to 240VAC	
	AC Input Frequency	47 to 63Hz	
	Inrush Current	200A @ 240VAC Max Load	
	Power Factor	>0.95 @ 120 VAC; >0.90 @ 240 VAC Full Load	
	No Load Power Consumption at 115VAC Input	≤ 0.077W	
	No Load Power Consumption at 230VAC Input	≤ 0.085W	
	115VAC Average Efficiency <sup>5</sup>	≥ 88.4% <sup>3</sup>	
	230VAC Average Efficiency <sup>5</sup>	≥ 90.4%	
	230VAC 10% Load Efficiency <sup>5</sup>	≥ 89.5%	
	Leakage Current	0.25mA max. @254vac, 50Hz	3.5mA max. @254vac, 50Hz
Protection	Over-Voltage	16V max., Auto-recovery	
	Short Circuit	Auto-recovery	
	Over-Current	10.5A max., Auto-recovery	
	Over-Temperature	Auto-recovery	
Environmental	Operating Temperature <sup>6</sup>	-10°C to +70°C (derate above +40°C)	
	Operating Humidity	5% to 90% RH max	
	Operating Altitude	Up to 5000m	
Safety and EMC Standards	Dielectric Withstand (HI-POT)	Primary to Secondary: 3000VAC or 4242Vdc for 1min, 10mA	
	Insulation Resistance	Primary to Secondary: >7M ohm for 500VDC	
	Standards	IEC 62368-1, UL 62368-1 3 <sup>rd</sup> Edition	
	EMI Emissions	EN55032 Class B, FCC Class B, CAN ICES-003(B)/NMB-003(B) Conducted and Radiated	
	Harmonic Current Emissions	IEC 61000-3-2	
	Immunity	EN 55035/CISPR 35: IEC 61000-4-2 (+/- 15kV air, +/- 8kV contact), IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5 (+/- 1kV L-L, 2kV L-G), IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11	
Mechanical	Dimensions (L x W x H)	141.5mm (5.57in) x 62.5mm (2.46in) x 33mm (1.30in)	
	Cable Length	1000mm 16AWG	
	Output Connector	2.1mm x 5.5mm x 9.5mm barrel	
	Input Connector	IEC 60320 C8	IEC 60320 C14
Notes	<ol style="list-style-type: none"> <li>The specifications defined are at ambient temperature of 25°C, unless otherwise specified.</li> <li>Special order model. Minimum order quantity applies.</li> <li>The 12V output models meet Efficiency Level VI and EU CoC Version 5 Teir 2. Consult factory for Level VII ready version.</li> <li>20MHz bandwidth frequency oscilloscope, add a 0.1µF multilayer Cap. and Low ESR Electrolytic Cap. (10µF) at output connector terminals (nominal line voltage, full load).</li> <li>Efficiency is measured after 30 minutes burn-in.</li> <li>Refer to derating curve.</li> </ol>		

## AA90x Series

Specifications<sup>1</sup>

Model		AA90W-190B-R <sup>2</sup>	AA90U-190B-R
Output	DC Output Voltage	19.0V	
	Max Current	4.74A	
	Output Power	90.06W	
	Regulation	± 5%	
	Ripple & Noise P-P(max) <sup>4</sup>	190mV	
Input	AC Input Voltage Range	90 to 264VAC	
	AC Input Voltage Rating	100 VAC to 240VAC	
	AC Input Frequency	47 to 63Hz	
	Inrush Current	200A @ 240VAC Max. Load	
	Power Factor	>0.95 @ 120 VAC; >0.90 @ 240 VAC Full Load	
	No Load Power Consumption at 115VAC Input	≤ 0.097W	
	No Load Power Consumption at 230VAC Input	≤ 0.115W	
	115VAC Average Efficiency <sup>5</sup>	≥ 91.1%	
	230VAC Average Efficiency <sup>5</sup>	≥ 91.3%	
	230VAC 10% Load Efficiency <sup>5</sup>	≥ 89.5%	
	Leakage Current	0.25mA max..@254vac, 50Hz	3.5mA max. @254vac, 50Hz
Protection	Over-Voltage	25V max., Auto-recovery	
	Short Circuit	Auto-recovery	
	Over-Current	6.6A max., Auto-recovery	
	Over-Temperature	Auto-recovery	
Environmental	Operating Temperature <sup>6</sup>	-10°C to +70°C (derate above +40°C)	
	Operating Humidity	5% to 90% RH max	
	Operating Altitude	Up to 5000m	
Safety and EMC Standards	Dielectric Withstand (HI-POT)	Primary to Secondary: 3000VAC or 4242Vdc for 1min, 10mA	
	Insulation Resistance	Primary to Secondary: >7M ohm for 500VDC	
	Standards	IEC 62368-1, UL 62368-1 3 <sup>rd</sup> Edition	
	EMI Emissions	EN55032 Class B, FCC Class B, CAN ICES-003(B)/NMB-003(B) Conducted and Radiated	
	Harmonic Current Emissions	IEC 61000-3-2	
	Immunity	EN 55035/CISPR 35: IEC 61000-4-2 (+/- 15kV air, +/- 8kV contact), IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5 (+/- 1kV L-L, 2kV L-G), IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11	
Mechanical	Dimensions (L x W x H)	141.5mm (5.57in) x 62.5mm (2.46in) x 33mm (1.30in)	
	Cable Length	1500mm 16AWG	
	Output Connector	2.1mm x 5.5mm x 9.5mm barrel	
	Input Connector	IEC 60320 C8	IEC 60320 C14
Notes	<ol style="list-style-type: none"> <li>The specifications defined are at ambient temperature of 25°C, unless otherwise specified.</li> <li>Special order model. Minimum order quantity applies.</li> <li>The 12V output models meet Efficiency Level VI and EU CoC Version 5 Teir 2. Consult factory for Level VII ready version.</li> <li>20MHz bandwidth frequency oscilloscope, add a 0.1µF multilayer Cap. and Low ESR Electrolytic Cap. (10µF) at output connector terminals (nominal line voltage, full load).</li> <li>Efficiency is measured after 30 minutes burn-in.</li> <li>Refer to derating curve.</li> </ol>		

## AA90x Series

Specifications<sup>1</sup>

Model		AA90W-240B-R <sup>2</sup>	AA90U-240B-R
Output	DC Output Voltage	24.0V	
	Max Current	3.75A	
	Output Power	90.0W	
	Regulation	± 5%	
	Ripple & Noise P-P(max) <sup>4</sup>	240mV	
Input	AC Input Voltage Range	90 to 264VAC	
	AC Input Voltage Rating	100 VAC to 240VAC	
	AC Input Frequency	47 to 63Hz	
	Inrush Current	200A @ 240VAC max Load	
	Power Factor	>0.95 @ 120 VAC; >0.90 @ 240 VAC Full Load	
	No Load Power Consumption at 115VAC Input	≤ 0.115W	
	No Load Power Consumption at 230VAC Input	≤ 0.124W	
	115VAC Average Efficiency <sup>5</sup>	≥ 91.7%	
	230VAC Average Efficiency <sup>5</sup>	≥ 91.9%	
	230VAC 10% Load Efficiency <sup>5</sup>	≥ 89.6%	
	Leakage Current	0.25mA max. @254vac, 50Hz	3.5mA max. @254vac, 50Hz
Protection	Over-Voltage	35V max., Auto-recovery	
	Short Circuit	Auto-recovery	
	Over-Current	5.3A max., Auto-recovery	
	Over-Temperature	Auto-recovery	
Environmental	Operating Temperature <sup>6</sup>	-10°C to +70°C (derate above +40°C)	
	Operating Humidity	5% to 90% RH max	
	Operating Altitude	Up to 5000m	
Safety and EMC Standards	Dielectric Withstand (HI-POT)	Primary to Secondary: 3000VAC or 4242Vdc for 1min, 10mA	
	Insulation Resistance	Primary to Secondary: >7M ohm for 500VDC	
	Standards	IEC 62368-1, UL 62368-1 3 <sup>rd</sup> Edition	
	EMI Emissions	EN55032 Class B, FCC Class B, CAN ICES-003(B)/NMB-003(B) Conducted and Radiated	
	Harmonic Current Emissions	IEC 61000-3-2	
	Immunity	EN 55035/CISPR 35: IEC 61000-4-2 (+/- 15kV air, +/- 8kV contact), IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5 (+/- 1kV L-L, 2kV L-G), IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11	
Mechanical	Dimensions (L x W x H)	141.5mm (5.57in) x 62.5mm (2.46in) x 33mm (1.30in)	
	Cable Length	1500mm 18AWG	
	Output Connector	2.1mm x 5.5mm x 9.5mm barrel	
	Input Connector	IEC 60320 C8	IEC 60320 C14
Notes	<ol style="list-style-type: none"> <li>The specifications defined are at ambient temperature of 25°C, unless otherwise specified.</li> <li>Special order model. Minimum order quantity applies.</li> <li>The 12V output models meet Efficiency Level VI and EU CoC Version 5 Teir 2. Consult factory for Level VII ready version.</li> <li>20MHz bandwidth frequency oscilloscope, add a 0.1µF multilayer Cap. and Low ESR Electrolytic Cap. (10µF) at output connector terminals (nominal line voltage, full load).</li> <li>Efficiency is measured after 30 minutes burn-in.</li> <li>Refer to derating curve.</li> </ol>		

## AA90x Series

Specifications<sup>1</sup>

Model		AA90W-480B-R <sup>2</sup>	AA90U-480B-R
Output	DC Output Voltage	48.0V	
	Max Current	1.875A	
	Output Power	90.0W	
	Regulation	± 5%	
	Ripple & Noise P-P(max) <sup>4</sup>	480mV	
Input	AC Input Voltage Range	90 to 264VAC	
	AC Input Voltage Rating	100 VAC to 240VAC	
	AC Input Frequency	47 to 63Hz	
	Inrush Current	200A @ 240VAC max Load	
	Power Factor	>0.95 @ 120 VAC; >0.90 @ 240 VAC Full Load	
	No Load Power Consumption at 115VAC Input	≤ 0.125W	
	No Load Power Consumption at 230VAC Input	≤ 0.137W	
	115VAC Average Efficiency <sup>5</sup>	≥ 91.5%	
	230VAC Average Efficiency <sup>5</sup>	≥ 91.8%	
	230VAC 10% Load Efficiency <sup>5</sup>	≥ 88.8%	
	Leakage Current	0.25mA max. @254vac, 50Hz	3.5mA max. @254vac, 50Hz
Protection	Over-Voltage	60V max., Auto-recovery	
	Short Circuit	Auto-recovery	
	Over-Current	2.7A max., Auto-recovery	
	Over-Temperature	Auto-recovery	
Environmental	Operating Temperature <sup>6</sup>	-10°C to +70°C (derate above +40°C)	
	Operating Humidity	5% to 90% RH max	
	Operating Altitude	Up to 5000m	
Safety and EMC Standards	Dielectric Withstand (HI-POT)	Primary to Secondary: 3000VAC or 4242Vdc for 1min, 10mA	
	Insulation Resistance	Primary to Secondary: >7M ohm for 500VDC	
	Standards	IEC 62368-1, UL 62368-1 3 <sup>rd</sup> Edition	
	EMI Emissions	EN55032 Class B, FCC Class B, CAN ICES-003(B)/NMB-003(B) Conducted and Radiated	
	Harmonic Current Emissions	IEC 61000-3-2	
	Immunity	EN 55035/CISPR 35: IEC 61000-4-2 (+/- 15kV air, +/- 8kV contact), IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5 (+/- 1kV L-L, 2kV L-G), IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11	
Mechanical	Dimensions (L x W x H)	141.5mm (5.57in) x 62.5mm (2.46in) x 33mm (1.30in)	
	Cable Length	1500mm AWG	
	Output Connector	2.1mm x 5.5mm x 9.5mm barrel	
	Input Connector	IEC 60320 C8	IEC 60320 C14
Notes	<ol style="list-style-type: none"> <li>The specifications defined are at ambient temperature of 25°C, unless otherwise specified.</li> <li>Special order model. Minimum order quantity applies.</li> <li>The 12V output models meet Efficiency Level VI and EU CoC Version 5 Teir 2. Consult factory for Level VII ready version.</li> <li>20MHz bandwidth frequency oscilloscope, add a 0.1μF multilayer Cap. and Low ESR Electrolytic Cap. (10μF) at output connector terminals (nominal line voltage, full load).</li> <li>Efficiency is measured after 30 minutes burn-in.</li> <li>Refer to derating curve.</li> </ol>		

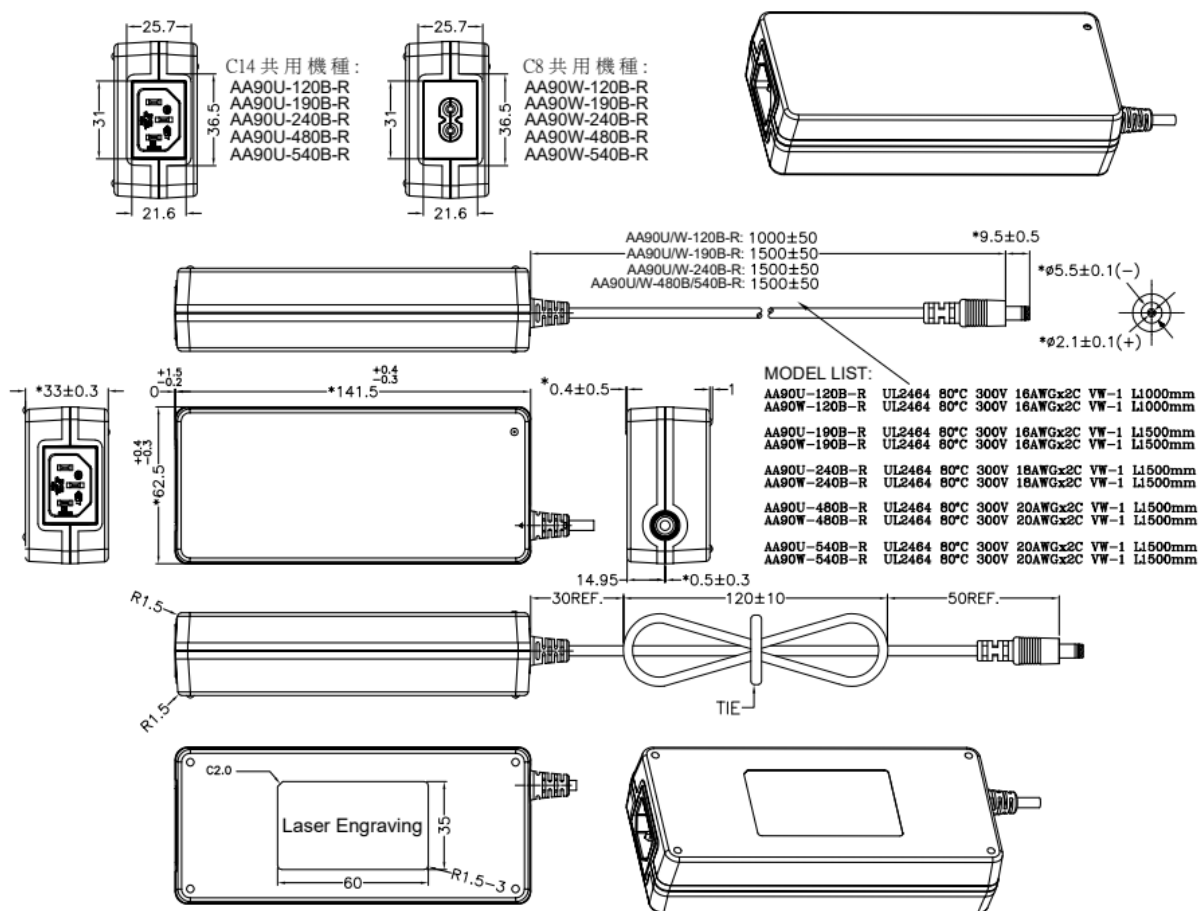
## AA90x Series

Specifications<sup>1</sup>

Model		AA90W-540B-R <sup>2</sup>	AA90U-540B-R
Output	DC Output Voltage	54.0V	
	Max Current	1.67A	
	Output Power	90.18W	
	Regulation	± 5%	
	Ripple & Noise P-P(max) <sup>4</sup>	540mV	
Input	AC Input Voltage Range	90 to 264VAC	
	AC Input Voltage Rating	100 VAC to 240VAC	
	AC Input Frequency	47 to 63Hz	
	Inrush Current	200A @ 240VAC max Load	
	Power Factor	>0.95 @ 120 VAC; >0.90 @ 240 VAC Full Load	
	No Load Power Consumption at 115VAC Input	≤ 0.128W	
	No Load Power Consumption at 230VAC Input	≤ 0.142W	
	115VAC Average Efficiency <sup>5</sup>	≥ 91.6%	
	230VAC Average Efficiency <sup>5</sup>	≥ 91.3%	
	230VAC 10% Load Efficiency <sup>5</sup>	≥ 87.6%	
	Leakage Current	0.25mA max. @254vac, 50Hz	3.5mA max. @254vac, 50Hz
Protection	Over-Voltage	60V max., Auto-recovery	
	Short Circuit	Auto-recovery	
	Over-Current	2.4A max., Auto-recovery	
	Over-Temperature	Auto-recovery	
Environmental	Operating Temperature <sup>6</sup>	-10°C to +70°C (derate above +40°C)	
	Operating Humidity	5% to 90% RH max	
	Operating Altitude	Up to 5000m	
Safety and EMC Standards	Dielectric Withstand (HI-POT)	Primary to Secondary: 3000VAC or 4242Vdc for 1min, 10mA	
	Insulation Resistance	Primary to Secondary: >7M ohm for 500VDC	
	Standards	IEC 62368-1, UL 62368-1 3 <sup>rd</sup> Edition	
	EMI Emissions	EN55032 Class B, FCC Class B, CAN ICES-003(B)/NMB-003(B) Conducted and Radiated	
	Harmonic Current Emissions	IEC 61000-3-2	
	Immunity	EN 55035/CISPR 35: IEC 61000-4-2 (+/- 15kV air, +/- 8kV contact), IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5 (+/- 1kV L-L, 2kV L-G), IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11	
Mechanical	Dimensions (L x W x H)	141.5mm (5.57in) x 62.5mm (2.46in) x 33mm (1.30in)	
	Cable Length	1500mm AWG	
	Output Connector	2.1mm x 5.5mm x 9.5mm barrel	
	Input Connector	IEC 60320 C8	IEC 60320 C14
Notes	<ol style="list-style-type: none"> <li>The specifications defined are at ambient temperature of 25°C, unless otherwise specified.</li> <li>Special order model. Minimum quantity order applies.</li> <li>The 12V output models meet Efficiency Level VI and EU CoC Version 5 Teir 2. Consult factory for Level VII ready version.</li> <li>20MHz bandwidth frequency oscilloscope, add a 0.1μF multilayer Cap. and Low ESR Electrolytic Cap. (10μF) at output connector terminals (nominal line voltage, full load).</li> <li>Efficiency is measured after 30 minutes burn-in.</li> <li>Refer to derating curve.</li> </ol>		

# AA90x Series

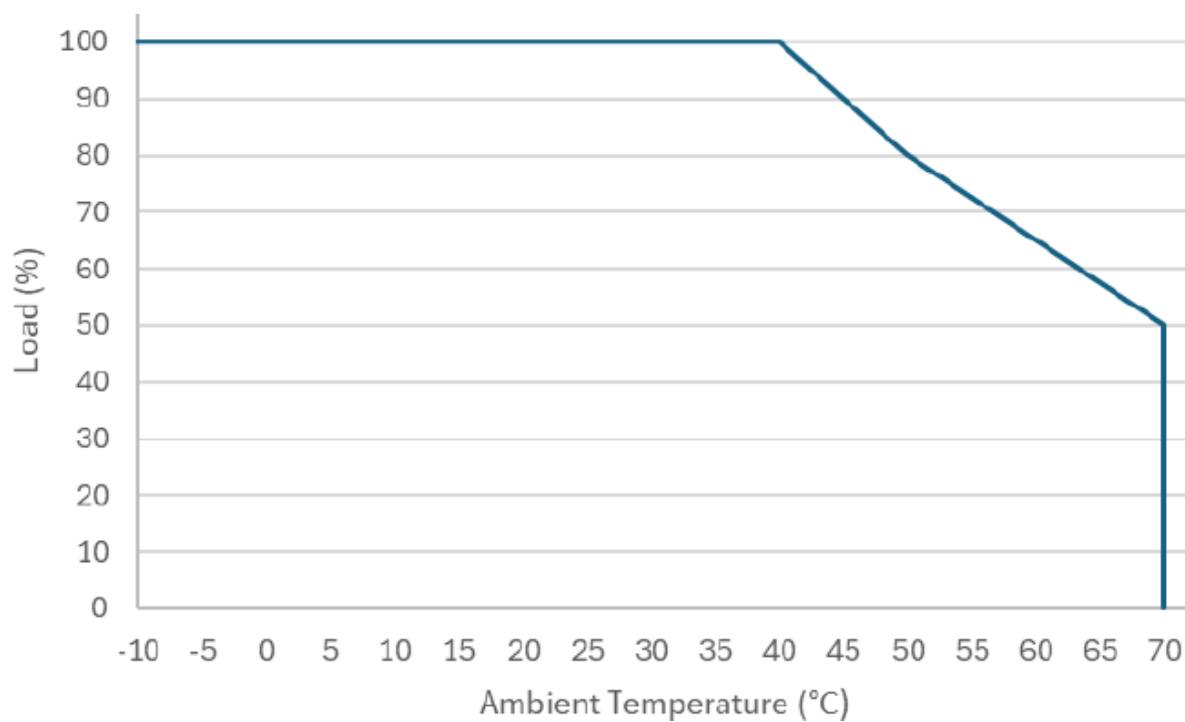
## Outline Drawing (mm)



# AA90x Series



## Derating Curve







**Supplier's Declaration of Conformity  
47 CFR § 2.1077 Compliance Information**

MODELS

AA90W-120B-R, AA90U-120B-R,  
AA90W-190B-R, AA90U-190B-R,  
AA90W-240B-R, AA90U-240B-R,  
AA90W-480B-R, AA90U-480B-R,  
AA90W-540B-R, AA90U-540B-R

Phihong USA Corporation  
47800 Fremont Boulevard  
Fremont, CA 94538  
Telephone: (510) 445-0100  
[www.phihong.com](http://www.phihong.com)

*This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

# AA90W Series Line Cords



Sold Separately

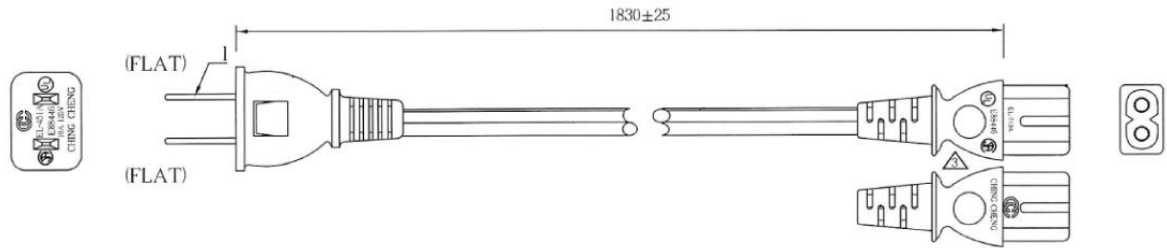
Model		AC15WNA-R	AC15WEU-R	AC15WUK-R
Specifications	Plug Type	North America NEMA 1-15P	Continental Europe CEE 7XVI	United Kingdom BS 1363
	Connector	IEC320 C7	IEC320 C7	IEC320 C7
	Wire Size	18 AWG	0.75mm	0.75mm
	Temperature	60°C	60°C	60 °C
	Amperage Rating	7A	2.5A	2.5A
	Voltage Rating	125V	250V	250V
	Cable Length	1830mm	1830mm	1830mm
Safety Approvals		CSA; UL	CEBEC; DEMKO; DVE; FIMKO; GOST; IMQ; KEMA; NEMKO; NF; OVE; SEMKO; SEV	BSI; Safety Mark
Photos				

# AA90W Series Line Cords

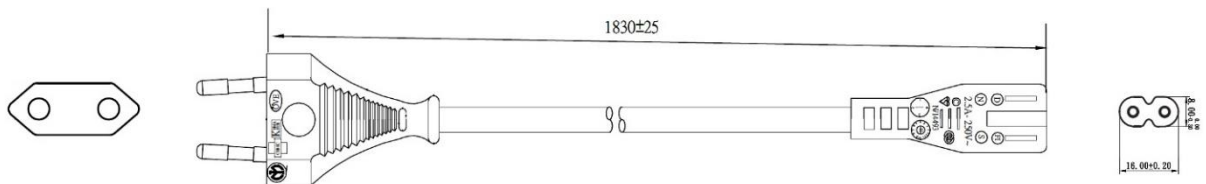


## Outline Drawing (mm)

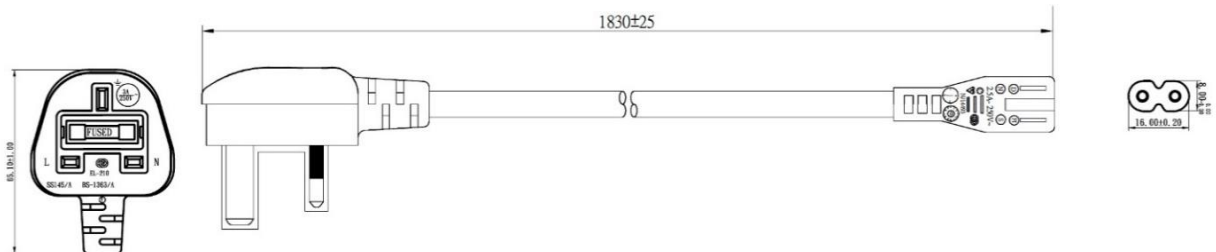
### AC15WNA-R



### AC15WEU-R






### AC15WUK-R



# AA90U Series Line Cords



Sold Separately

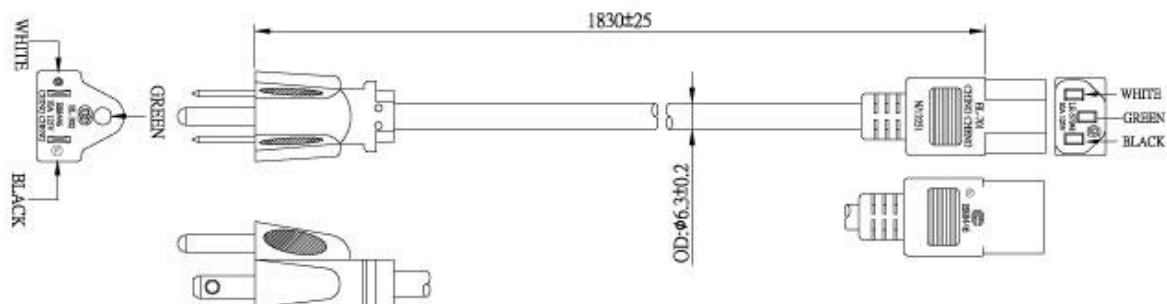
Model		AC30UNA-R	AC30UEU-R	AC30UUK-R
Specifications	Plug Type	North America NEMA 5-15P	Continental Europe CEE 7VIII	United Kingdom BS 1363
	Connector	IEC320 C13	IEC320 C13	IEC320 C13
	Wire Size	18 AWG	0.75mm	1.0mm
	Temperature	60°C	60°C	70 °C
	Amperage Rating	10A	6A	10A
	Voltage Rating	125V	250V	250V
	Cable Length	1830mm	1830mm	2500mm
Safety Approvals		CSA; UL	CEBEC; DEMKO; DVE; FIMKO; GOST; IMQ; KEMA; NEMKO; NF; OVE; SEMKO	BSI; Safety Mark
Photos				

# AA90U Series Line Cords

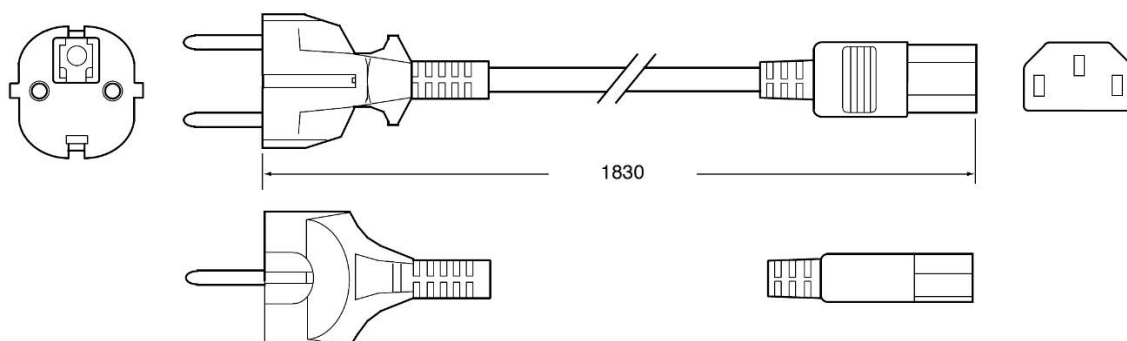


## Outline Drawing (mm)

### AC30UNA-R



### AC30UEU-R



### AC30UUK-R

