

# Industrial Adapter 24V Series



## Single Output 60W Non-PFC Data Sheet

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### Description

This series is a class 1, single-output AC to DC 60W green adapter with C6 inlet type. It can be operated from AC 90V~264V with good efficiency performance for various ITE, industrial and networking application. It also complies world-wide Safety and EMC regulations.

### Features

- \* Full AC input voltage design with C6 socket
- \* Withstand 300Vac surge voltage for 5 seconds
- \* Full Protections: Short-circuit/ Over-voltage/ Over-current/ Over temperature operating.
- \* Energy efficiency level VI compliance
- \* Slim and compact in size
- \* Various DC plug types available
- \* IEC/EN 62368-1 design compliance
- \* Up to 5000 meters operating altitude (note #4)
- \* High reliability



### Electrical Specification

Model Name	HA-1600-24EC
<b>Output</b>	
Rated power	60W
Rated voltage	24V
Rated current	2.5A
Ripple & Noise(max.) (note #2)	400mV
Line & load regulation	±5%
Hold-up time(typ.)	10ms
Timing: AC ON delay / rising (max.)	3 sec / 30ms
<b>Input</b>	
Rated voltage range	100~240Vac
Operated voltage range	90~264Vac, 300Vac for 5 sec
Current range (max.)	1.7A/100Vac
Inrush current	No component damaged (<math>I^2 \cdot t</math>).
Frequency range	50-60Hz

Leakage current (max.)	0.25mA at 240Vac
Average efficiency (min.)	89%
<b>Protection Function</b>	
Over voltage (max.)	150% of rated voltage, hiccup mode protection until fault is removed
Over current (max.)	160% of rated current, hiccup mode protection until fault is removed
Short circuit at O/P	No damage, hiccup mode protection until fault is removed
Over temperature	No damage, auto recovery until temperature is back to normal
<b>Others</b>	
MTBF (min.) (note#3)	300K hours @ rated load
<b>Environment</b>	
Temperature (note#5)	(operating) -20~70°C / (storage) -40~85°C
Humidity	(operating) 10~90% RH non-condensing / (storage) 5~95% RH
Altitude (max.)	5000 meters
<b>Mechanical</b>	
Dimension	90.0(L)*65.0(W)*21mm(H)
Vibration	10~500 Hz, 5G 20min./1cycle per axis for all axes (X, Y, Z)
Weight (typ.)	185g
<b>Safety</b>	
Standard	IEC/EN 60950-1, K60950-1, IEC/EN 62368-1, CNS14336-1
Withstand voltage	Input-Output: 4242VDC / Input-FG: 2150VDC
Isolation resistance(min.)	Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH
<b>EMC</b>	
EN55032 (CISPR32)	Conducted EMI: class B / Radiated EMI: class B
FCC	Conducted EMI: class B / Radiated EMI: class B
EN61000-3-2	Harmonic distortion: not applicable
EN61000-4-2	ESD: ±8KV contact discharge / ±15KV contact discharge
EN61000-4-3	Radiated RF immunity: 3V/m
EN61000-4-4	EFT: ±1KV (AC port)
EN61000-4-5	Surge: ±2KV DM / ±4KV CM
EN61000-4-6	Conducted RF immunity: 3V/m
EN61000-4-8	Magnetic field immunity: 3A/m
EN61000-4-11	Voltage dip immunity

## Notes

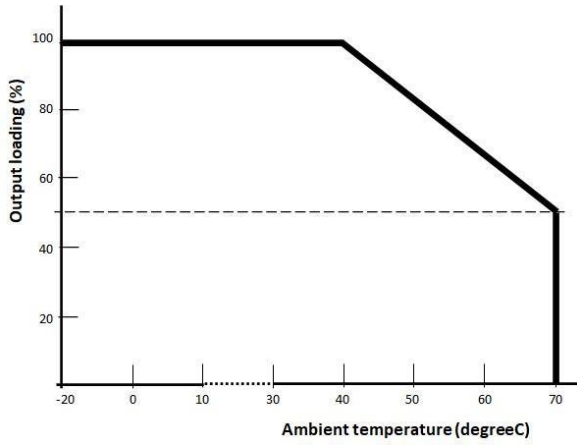
#1: All specification defined at 230Vac/50Hz, rated power and 25°C ambient temperature if not mentioned specifically.

#2: Ripple noise is measured by a 30cm length, twisted wires with 0.47uF MLCC & 47uF low ESR capacitor.

#3: Calculated by Telcordia SR332 at 25°C ambient temperature.

#4: When operating altitude is higher than 2000m, the environment temperature derating factor is 0.36°C/100m.

#5: De-rating curve of ambient temperature:



### Mechanical Specification

#### HA-1600-24EC

