# AQM450 series

## 450W Convection cooled

AC-DC power supplies

The AQM450 series of compact GaN based medical external AC-DC power supplies deliver 450W of convection cooled power. AQM450's GaN based design offers high efficiency and high power density, enabling a 50% size reduction relative to traditional designs. AQM450 also features a fully sealed enclosure with IP22 compliance and a smooth surface finish, ensuring easy cleaning in clinical environments.

AQM450's worldwide medical and industrial safety approvals, Class B conducted and radiated emissions, 2 x MOPP isolation and low leakage current benefits system designers with easy integration into a wide range of medical applications including imaging, patient monitoring, patient treatment, hospital equipment, and industrial applications such as test & measurement, process control and robotics.

## Features

- Regulated single outputs 12V to 56VDC
- Universal, single phase input: 90 to 264VAC
- GaN based compact design
- Medical & ITE safety agency approvals
- IP22 environmental rating
- High efficiency, up to 94%
- Low earth leakage current
- <0.5W standby power
- Class B conducted & radiated emissions
- 0 to +60°C operation
- 3 year warranty

## Applications

Robotics

Technology

Instrumentation

Healthcare

Medical Diagnostics

## Dimensions

254 x 116 x 47mm (10" x 4.57" x 1.85")

## Models & ratings

| Model number | Output voltage | Output current | Total regulation | Efficiency[1] |
|---|---|---|---|---|
| AQM450PS12[2] | 12.0V | 33.34A | 5% | 91% |
| AQM450PS19 | 19.0V | 23.60A | | 92% |
| AQM450PS24 | 24.0V | 18.75A | | 93% |
| AQM450PS48 | 48.0V | 9.38A | | 94% |
| AQM450PS56[2] | 56.0V | 8.05A | | 94% |

**Notes:**

1. Measured at full load and 230VAC.
2. Available for OEM quantities.

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## Input

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions |
|---|---|---|---|---|---|
| Input voltage | 90 | | 264 | VAC | Derate linearly from 100% load at 100VAC to 90% load at 90VAC |
| Input frequency | 47 | | 63 | Hz | |
| Power factor | | >0.9 | | | EN61000-3-2 class A |
| Input current | | | 4.8/2.4 | A | 115/230VAC |
| Inrush current | | | 150 | A | 240VAC cold start, 25°C |
| Earth leakage current | | | 1.0 | mA | 264VAC, 60Hz |
| No load input power | | | 0.4 | W | |
| Input protection | T8A/250V Internal fuse fitted in line and neutral | | | | |
| LED indicator | Green LED indicates DC OK | | | | |

## Output

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions |
|---|---|---|---|---|---|
| Output voltage | 12 | | 56 | VDC | See models and ratings table |
| Initial set accuracy | | | ±2 | % | 50% load |
| Minimum load | No minimum load required | | | | |
| Start up delay | | | 3 | s | |
| Start up rise time | | 30 | 35 | ms | 115VAC |
| Hold up time | 10 | | | ms | Full load and 115/230VAC |
| Line regulation | | | ±0.5 | % | 90-264 VAC |
| Total regulation | See model and ratings table, includes initial set accuracy, line and load regulation | | | | |
| Transient response | | | 4 | % | Recovery within 1% in less than 500µs for a 50-75% and 75-50% load step |
| Ripple and noise | | | 1 | % pk-pk | 20MHz bandwidth and 47µF electrolytic at 25°C in parallel with 0.1µF ceramic capacitor at 25°C |
| Overshoot | | 5 | 10 | % | At turn on/turn off |
| Overload protection | 110 | | 150 | % | |
| Overvoltage protection | 110 | | 150 | % | Recycle mains to reset |
| Short circuit protection | Trip and restart (hiccup), auto resetting | | | | |
| Temperature coefficient | | 0.2 | | %/°C | |
| Patient leakage current | | 85 | 100 | µA | 264VAC, 60Hz |

# AQM450 series

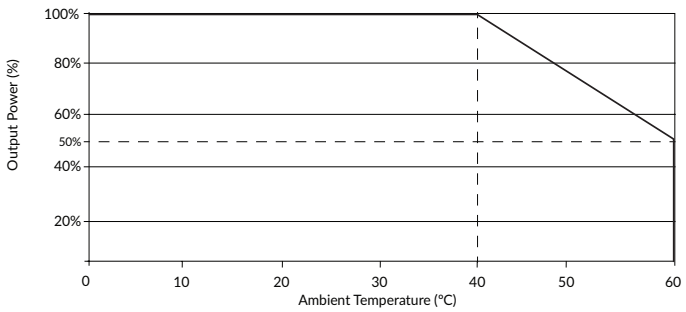
## Environmental

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions |
|---|---|---|---|---|---|
| Operating temperature | 0 | | +60 | °C | Derate linearly from 100% load at 40°C to 50% load at 60°C, safety approved to 40°C |
| Cooling | Natural convection | | | | |
| Operating humidity | 20 | | 80 | %RH | Non-condensing |
| Storage humidity | 10 | | 90 | %RH | Non-condensing |
| Storage temperature | -20 | | 80 | °C | |
| Operating altitude | | | 5000 | m | |

## General

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions |
|---|---|---|---|---|---|
| Efficiency | 91 | 93 | | % | See models and ratings table |
| Isolation: input to output | 4000 | | | VAC | 2 x MOPP |
| input to ground | 1800 | | | VAC | 1 x MOPP |
| output to ground | 500 | | | VAC | |
| Switching frequency | 80 | | 100 | kHz | PFC (varies with load and input voltage) |
| | 70 | | 130 | | Main converter (varies with load) |
| Power density | | 0.32 | | W/cm$^3$ | |
| Mean time between failure | 300 | | | khrs | TELCORDIA SR-322 @ 25°C |
| Weight | | 1600 (3.53) | | g (lb) | |

## Derating curve



# AQM450 series

## Emissions - EMC

| Phenomenon | Standard | Test level | Notes & conditions |
|---|---|---|---|
| Conducted | EN55032/EN55011 | Class B | |
| Radiated | | | |
| Harmonic currents | EN61000-3-2 | Class A | |
| Voltage flicker | EN61000-3-3 | | |

## Emissions - immunity

| Phenomenon | Standard | Test level | Criteria | Notes & conditions |
|---|---|---|---|---|
| ESD immunity | EN61000-4-2 | 4 | A | ±8kV contact / ±15kV air discharge |
| Radiated immunity | EN61000-4-3 | 10V/m | A | |
| EFT/burst | EN61000-4-4 | ±2kV | A | |
| Surge | EN61000-4-5 | Installation class 3 | A | ±1kV line to lin, ±2kV line to earth |
| Conducted | EN61000-4-6 | 6V | A | |
| Magnetic field | EN61000-4-8 | 30A/m | A | |
| Dips and interruptions | EN55035 (115VAC) | Dip:100% (0VAC), 10ms | A | 115VAC and above/100VAC |
| | | Dip:30% (80.5VAC), 500ms | A | |
| | | Dip:100% (0VAC), 500ms | B | |
| | EN55035 230VAC) | Dip:100% (0VAC), 10ms | A | |
| | | Dip:30% (181VAC), 500ms | A | |
| | | Dip:100% (0VAC), 500ms | B | |
| | EN60601-1-2 (100VAC) | Dip:100% (0VAC), 10ms | A | |
| | | Dip:100% (0VAC), 20ms | B | |
| | | Dip:30% (70VAC), 500ms | B | |
| | | Dip:100% (0VAC), 5000ms | B | |
| | EN60601-1-2 (240VAC) | Dip:100% (0VAC), 10ms | A | |
| | | Dip:100% (0VAC), 20ms | B | |
| | | Dip:30% (168VAC), 500ms | A | |
| | | Dip:100% (0VAC), 5000ms | B | |

## Safety approvals

| Safety agency | Standard | Notes & conditions |
|---|---|---|
| UL | UL62368-1 | Audio/video, information and communication technology equipment |
| | ANSI/AAMI ES60601-1 & CSA C22.2 No.60601-1 | Medical |
| EN | EN62368-1 | Audio/video, information and communication technology equipment |
| | EN60601-1 | Medical |
| CB | IEC62368-1 | Audio/video, information and communication technology equipment |
| | IEC60601-1 | Medical |
| CE | Meets all applicable directives | |
| UKCA | Meets all applicable legislation | |

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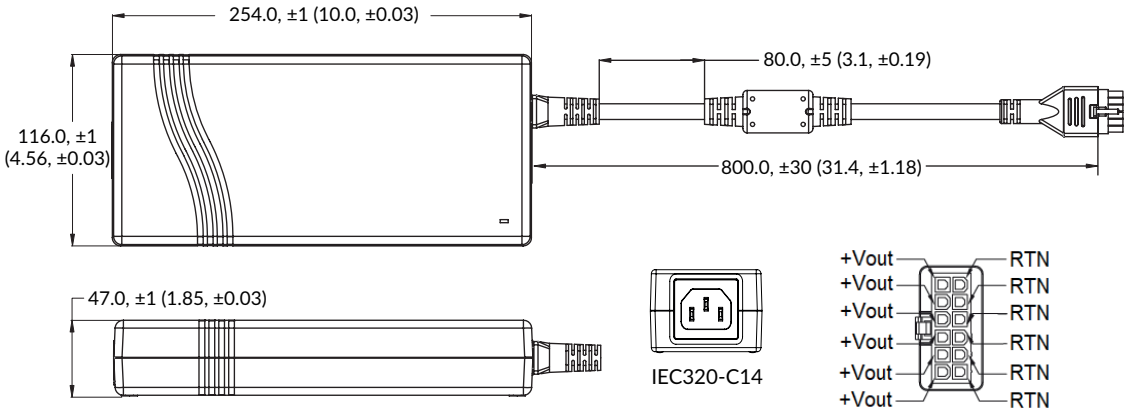
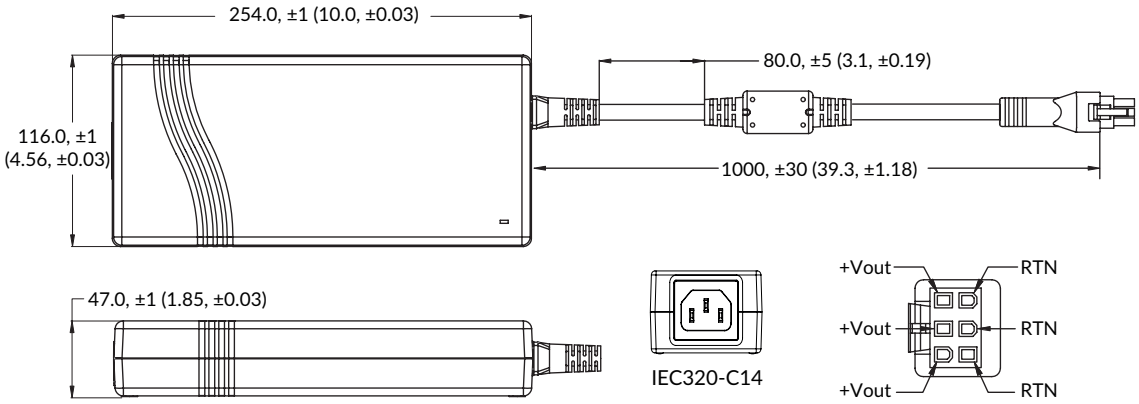
## Mechanical details

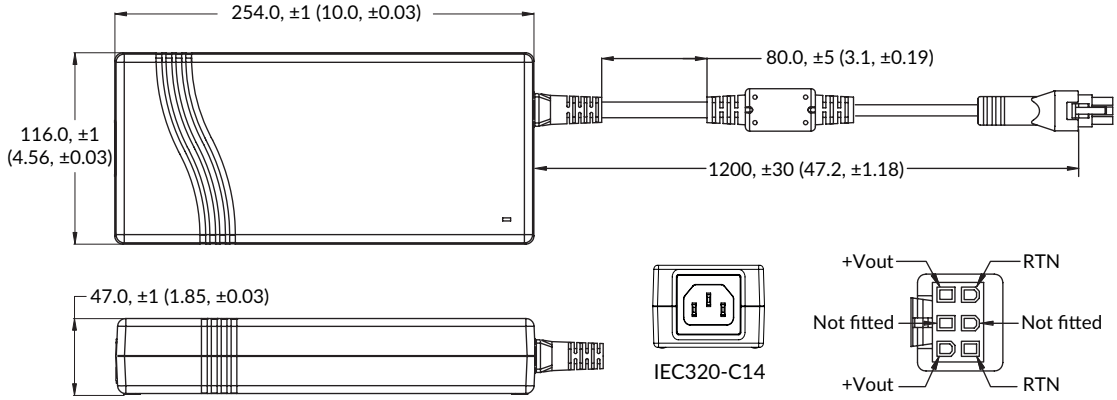
**12V model**




**19V & 24V models**




**48V & 56V models**




**Notes:**

1. All dimensions shown in mm (inches).
2. Weight: 1600g (3.53lb) approx.
3. Output connector: 12 pin Molex Mini Fit with 39-012125 housing for 12V model and 6 pin Molex Mini Fit with 39-01-2065 housing for other models and 39-00-0077 terminals. Mates with 5566 headers or equivalent.

Specifications subject to change without notice.