ARCH ELECTRONICS CORP.

AC-DC Switching Power Supply

# AQFV480U SERIES (CV Mode) 480 Watts

## KEY FEATURES

- U Bracket Switching Power Supply
- Universal Input: 90-264 VAC
- Active P.F.C. Function, PF>0.95
- 300W Convection without FAN
- 480W Convection with 18CFM FAN
- Protections: Over Load / Over Voltage / Over Temperature / Short Circuit All by Auto-recovery
- Built-in Remote ON/OFF Control
- Built-in Remote Sense Function
- Built-in DC OK Signal
- Stand by 5V @ 0.3A
- Stand by 5V @ 0.6A with 18CFM FAN
- High Efficiency up to 92%
- Ultra Compact Size: 7.0 x 4.2 x 1.78 Inches
- 3-Years Product Warranty



| Standard | A Type |
|---|---|
|  |  |
|  |  |

E199779 LEVEL3

## ELECTRICAL SPECIFICATIONS

| Model No. | | | AQFV480U-12S | AQFV480U-24S | AQFV480U-36S | AQFV480U-48S |
|---|---|---|---|---|---|---|
| Max Output Wattage (Convection) (W) | | | 280W | 280W | 300W | 300W |
| Max Output Wattage (18CFM FAN) (W) | | | 480W | | | |
| Input | Voltage | | 90-264 VAC or 120-370 VDC | | | |
| | Frequency (Hz) | | 47-63 Hz | | | |
| | Current (Full load) | | < 5.5 A max. (115 VAC) / < 3.0 A max. (230 VAC) | | | |
| | Inrush Current (<2ms) | | < 50 A max. (115 VAC) / < 70 A max. (230 VAC) | | | |
| | Leakage Current | | < 0.5 mA max.(240VAC 63Hz) | | | |
| | Power Factor | | PF>0.95 (115 VAC) / PF>0.90 (230 VAC) at Full Load | | | |
| Output | Voltage (V.DC.) | | 12V | 24V | 36V | 48V |
| | Trim | | 10.8 ~ 13.2V | 21.6 ~ 26.4V | 32.4 ~ 39.6V | 43.2 ~ 50.4V |
| | Voltage Accuracy | | ±2% | | | |
| | Current (Convection) (A) max | | 23.33 | 11.66 | 8.33 | 6.25 |
| | Current (18CFM FAN) (A) max | | 40 | 20 | 13.33 | 10 |
| | Line Regulation (LL-HL) (typ.) | | ±0.5% | | | |
| | Load Regulation (5-100%) (typ.) | | ±1% | | | |
| | Minimum Load | | 5% | | | |
| | Maximum Capacitive Load | | 180000 uF | 75000 uF | 50000 uF | 25000 uF |
| | Ripple & Noise (max.) | | 100mVp-p | 200mVp-p | 200mVp-p | 300mVp-p |
| | Efficiency (Convection) (%) | Vin:115(V.AC) | 88% | 89% | 90% | 89% |
| | | Vin:230(V.AC) | 90% | 91% | 92% | 91% |
| | Efficiency (18CFM FAN) (%) | Vin:115(V.AC) | 85% | 87% | 89% | 88% |
| | | Vin:230(V.AC) | 88% | 90% | 92% | 91% |
| | Hold-up Time | | 10 ms min. | | | |
| | Switching Frequency | | 62.5 kHz ±10% | | | |
| Protection | Over Power Protection | | Auto recovery | | | |
| | Over Voltage Protection | | Auto recovery | | | |
| | Over Temperature | | Auto recovery | | | |
| | Short Circuit Protection | | Auto-recovery | | | |
| Isolation | Input-Output (V.AC) | | 3000V | | | |
| | Input-FG (V.AC) | | 1500V | | | |
| | Output-FG (V.AC) | | 500V | | | |

1. All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.
2. Ripple & Noise are measured at 20MHz of bandwidth with 0.1uF & 47uF parallel capacitor.

http://www.archcorp.com.tw
TEL: +886-2-26989508 FAX: +886-2-26981319

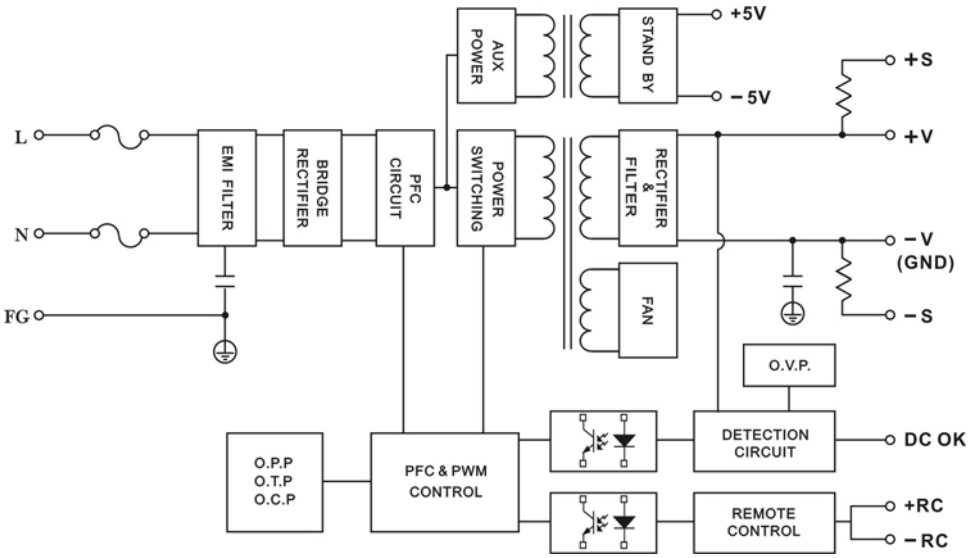
# AQFV480U SERIES (CV Mode) 480 Watts

## ELECTRICAL SPECIFICATIONS

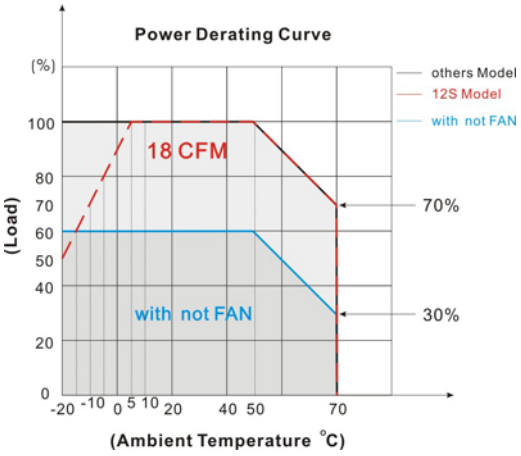
| Model No. | | AQFV480U-12S | AQFV480U-24S | AQFV480U-36S | AQFV480U-48S |
|---|---|---|---|---|---|
| Function | 5V Stand by (18CFM FAN) | 5VSB: 5V@0.6A ; Tolerance ±10% , Ripple & Noise: 100m Vp-p (max.) | | | |
| | DC OK Signal | Turn ON: 4~6V ; Turn OFF: 0~1V | | | |
| | Remote Control | +RC / -RC: Power ON=open ; Power OFF=short | | | |
| | FAN Control | 12VDC / 0.5A max. | | | |
| Environment | Operating Temperature | -20°C…+70°C (with derating) | | | |
| | Storage Temperature | -25°C…+85°C | | | |
| | Temperature Coefficient | ±0.03%/°C ( 0~50°C ) | | | |
| | Humidity | 95% RH | | | |
| | MTBF | >100,000 h @ 25°C (MIL-HDBK-217F) | | | |
| | Vibration | 10~500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes. | | | |
| Physical | Dimension (L x W x H) | 7.0 x 4.2 x 1.78 Inches (177.8 x 106.5 x 45.0 mm ) Tolerance ±0.5 mm | | | |
| | Weight | 780 g | | | |
| Safety | Agency Approvals | UL60950-1, CE(Surge:4KV) | | | |
| EMC | EMI (Conducted & Radiated Emission) | EN 55022 class B | | | |
| | EMS (Noise Immunity) | EN 55024 | | | |

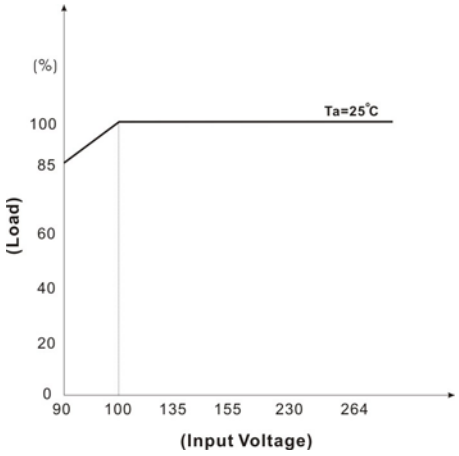
1. All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.
2. Ripple & Noise are measured at 20MHz of bandwidth with 0.1uF & 47uF parallel capacitor.

## BLOCK DIAGRAM




## DERATING



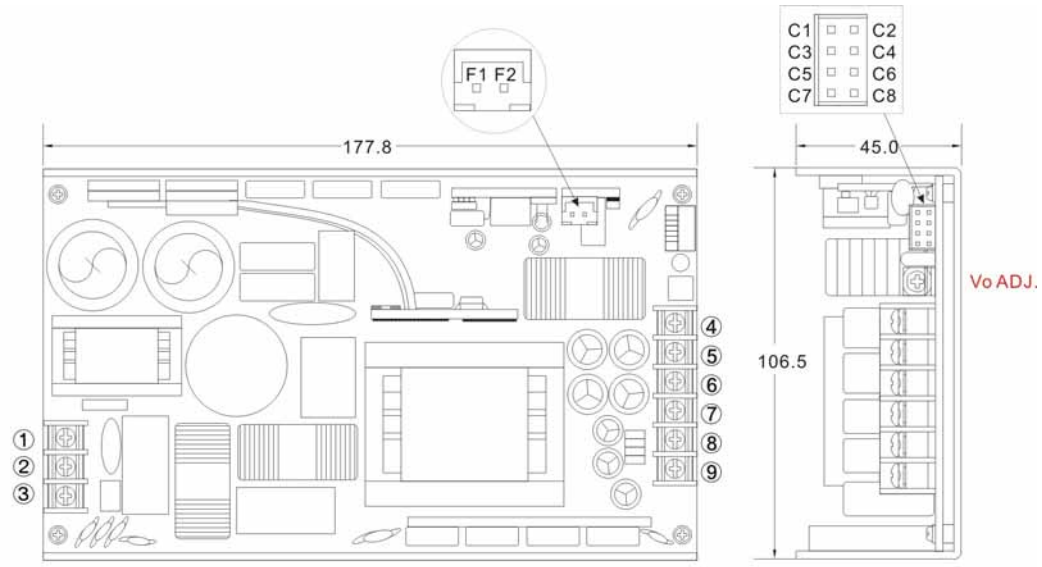
# AQFV480U SERIES (CV Mode) 480 Watts

## MECHANICAL DIMENSION

### Standard





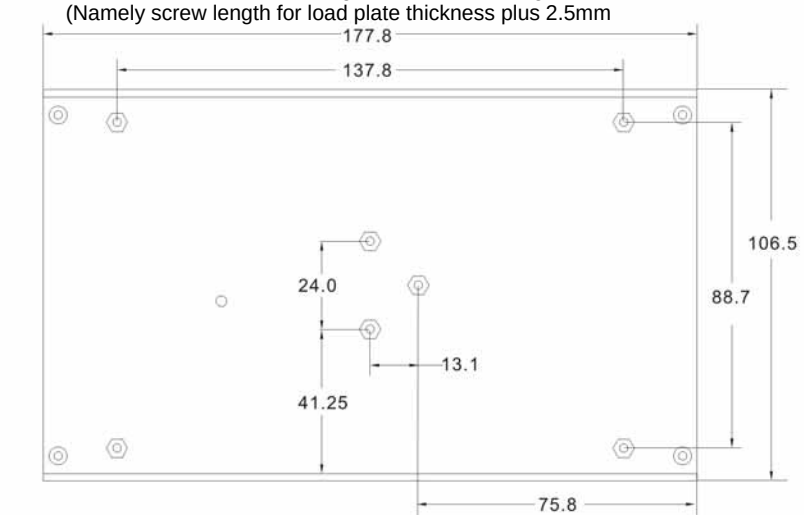






**ASSEMBLY INSTRUCTIONS**
*U Case T=2.0mm

Customer screws into the length of the case no higher than 0.5mm
(Namely screw length for load plate thickness plus 2.5mm




| AC Input Terminal Pin | |
|---|---|
| PIN# | SINGLE |
| 1 | AC IN (N) |
| 2 | AC IN (L) |
| 3 | ⏚ |

| DC Output Terminal Pin | |
|---|---|
| PIN# | SINGLE |
| 4~6 | +DC OUT |
| 7~9 | -DC OUT |

| Connector Pin (CN4) | |
|---|---|
| PIN# | SINGLE |
| C1 | +S |
| C2 | -S |
| C3 | +RC |
| C4 | -RC |
| C5 | DC-OK |
| C6 | GND |
| C7 | +5V SB |
| C8 | -5V SB |

| FAN Molex Pin | |
|---|---|
| PIN# | SINGLE |
| F1 | -DC |
| F2 | +DC |

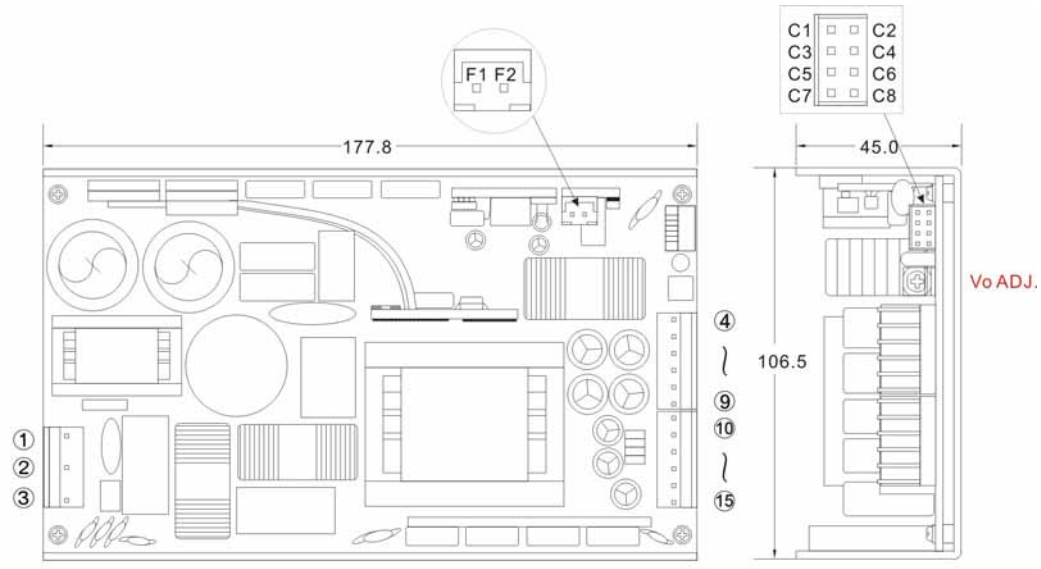
# AQFV480U SERIES (CV Mode) 480 Watts

## MECHANICAL DIMENSION

### A Type





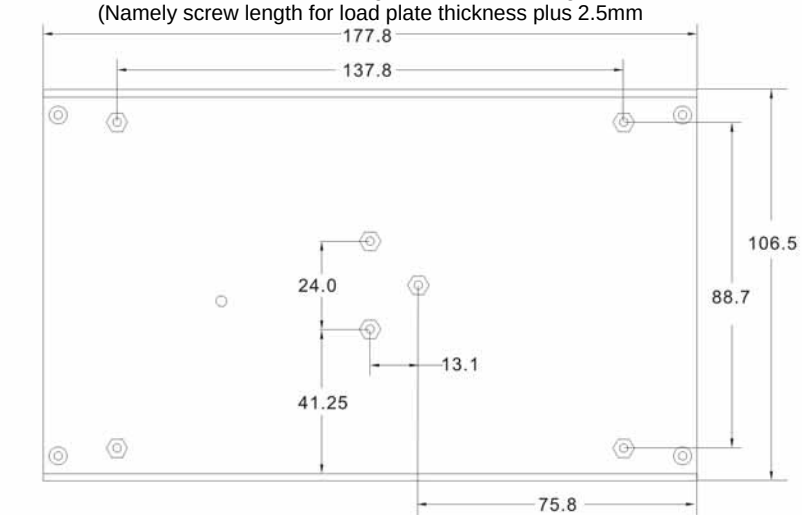






**ASSEMBLY INSTRUCTIONS**
*U Case T=2.0mm

Customer screws into the length of the case no higher than 0.5mm
(Namely screw length for load plate thickness plus 2.5mm




| AC Input Terminal Pin | |
|---|---|
| PIN# | SINGLE |
| 1 | AC IN (N) |
| 2 | AC IN (L) |
| 3 | ⏚ |

| DC Output Terminal Pin | |
|---|---|
| PIN# | SINGLE |
| 4~9 | +DC OUT |
| 10~15 | -DC OUT |

| Connector Pin (CN4) | |
|---|---|
| PIN# | SINGLE |
| C1 | +S |
| C2 | -S |
| C3 | +RC |
| C4 | -RC |
| C5 | DC-OK |
| C6 | GND |
| C7 | +5V SB |
| C8 | -5V SB |

| FAN Molex Pin | |
|---|---|
| PIN# | SINGLE |
| F1 | -DC |
| F2 | +DC |

# AQFV480U SERIES (CV Mode) 480 Watts

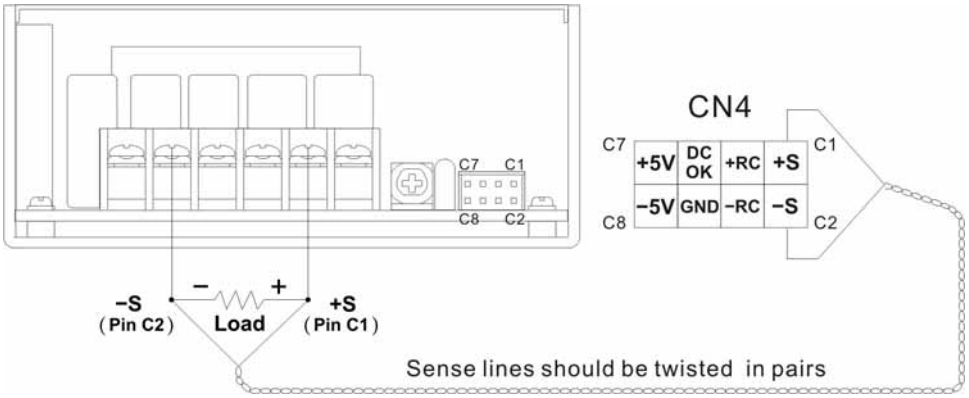
## FUNCTION DESCRIPITON of CN4 :

| Pin No. | Function | Description |
|---|---|---|
| C1 | +S | Positive sensing. The +S signal should be connected to the positive terminal of the load.<br>The +S and -S leads should be twisted in pair to minimize noise pick-up effect.<br>The maximum line drop compensation is 0.5V. (max.) |
| C2 | -S | Negative sensing. The -S signal should be connected to the negative terminal of the load.<br>The -S and +S leads should be twisted in pair to minimize noise pick-up effect.<br>The maximum line drop compensation is 0.5V. (max.) |
| C3 | +RC | Turns the output on and off by electrical or dry contact between pin C4 (-RC), Short: Power OFF, Open: Power ON. |
| C4 | -RC | Remote control ground. |
| C5 | DC-OK | DC-OK Signal is a DC output, referenced to pinC6(DC-OK GND). |
| C6 | GND | This pin connects to the negative terminal(-V). Return for DC-OK signal output. |
| C7 | +5V SB | Stand by voltage output ground 4.5~5.5V, referenced to pin C8(-5V SB). The maximum load current is 0.6A. |
| C8 | -5V SB | Stand by voltage output ground. |

## FUNCTION MANUAL :

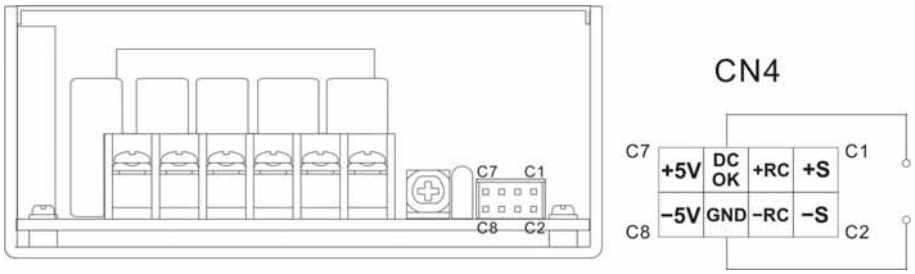
### 1. Remote Sense

The remote sensing compensates voltage drop on the load wiring up to 0.5V. (max.)




### 2. DC-OK Signal

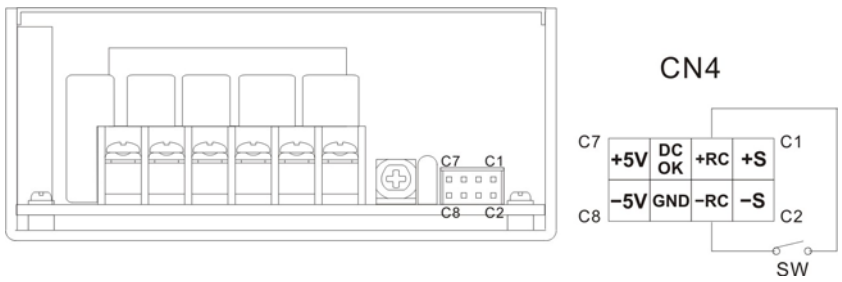
| Between DC-OK(pinC5) and GND(pinC6) | Output Status |
|---|---|
| 4~6V | ON |
| 0~1V | OFF |




### 3. Remote Control

It can be turned ON/OFF by using the "Remote Control" function.

| Between RC+(pinC3) and RC-(pinC4) | Output Status |
|---|---|
| SW ON (Short) | OFF |
| SW OFF (Open) | ON |



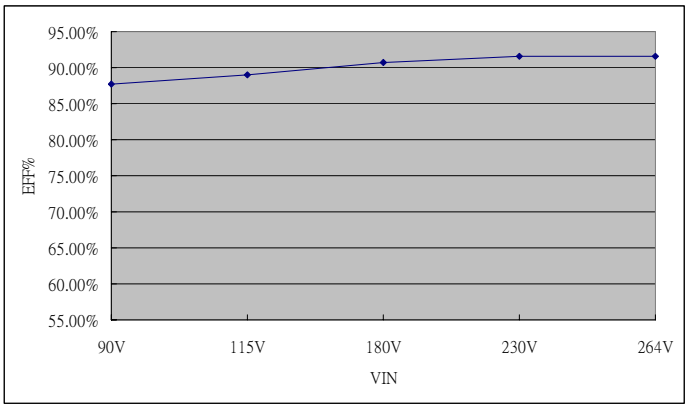
# AQFV480U SERIES (CV Mode) 480 Watts

## EFFICIENCY VERSUS LOAD (without FAN)

### AQFV480U-12S

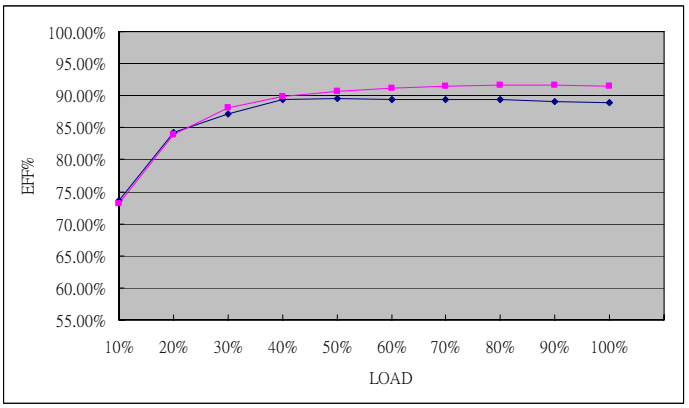
VIN VS Efficiency

| Input Voltage (V) | 90 | 115 | 180 | 230 | 264 |
|---|---|---|---|---|---|
| Efficiency (%) | 87.70 | 88.97 | 90.68 | 91.55 | 91.63 |




LOAD VS Efficiency

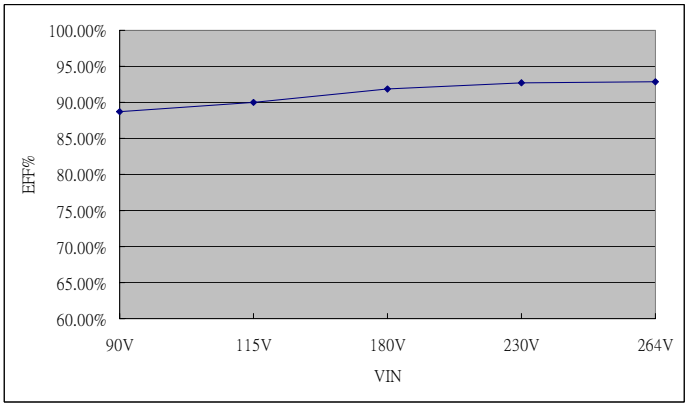
| Load (%) | 0 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|
| 115V (%) | 0 | 73.70 | 84.20 | 87.18 | 89.37 | 89.51 |
| 230V (%) | 0 | 73.11 | 83.95 | 88.09 | 89.80 | 90.63 |
| Load (%) | 60 | 70 | 80 | 90 | 100 | |
| 115V (%) | 89.46 | 89.35 | 89.37 | 89.07 | 88.97 | |
| 230V (%) | 91.18 | 91.54 | 91.59 | 91.62 | 91.55 | |




### AQFV480U-24S

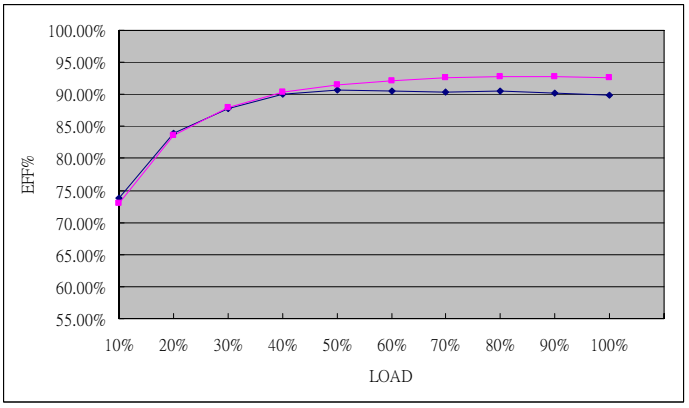
VIN VS Efficiency

| Input Voltage (V) | 90 | 115 | 180 | 230 | 264 |
|---|---|---|---|---|---|
| Efficiency (%) | 88.70 | 89.95 | 91.82 | 92.66 | 92.85 |




LOAD VS Efficiency

| Load (%) | 0 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|
| 115V (%) | 0 | 73.81 | 83.92 | 87.82 | 90.05 | 90.66 |
| 230V (%) | 0 | 73.06 | 83.67 | 88.00 | 90.34 | 91.51 |
| Load (%) | 60 | 70 | 80 | 90 | 100 | |
| 115V (%) | 90.55 | 90.42 | 90.48 | 90.20 | 89.95 | |
| 230V (%) | 92.14 | 92.60 | 92.84 | 92.84 | 92.66 | |



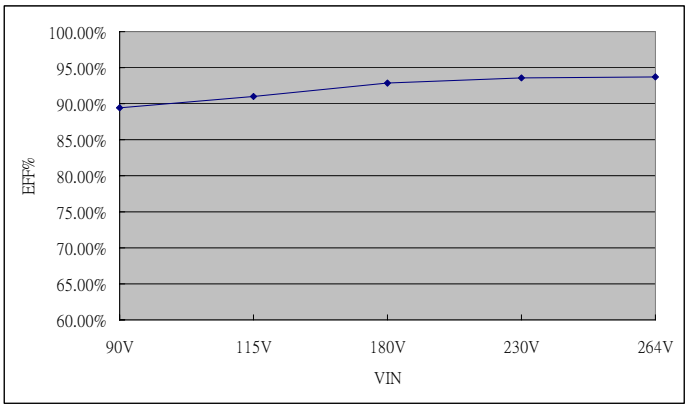
# AQFV480U SERIES (CV Mode) 480 Watts

## EFFICIENCY VERSUS LOAD (without FAN)

### AQFV480U-36S

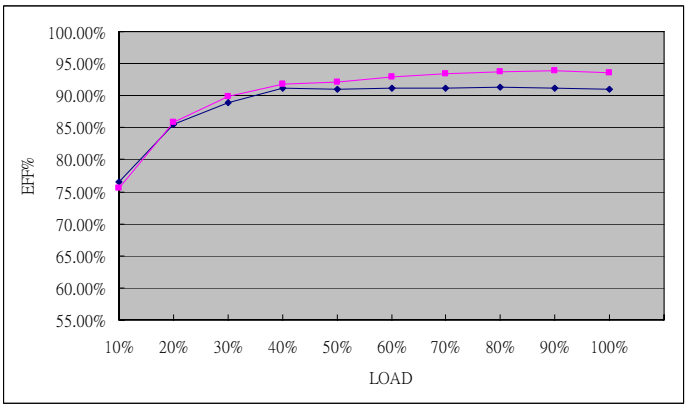
VIN VS Efficiency

| Input Voltage (V) | 90 | 115 | 180 | 230 | 264 |
|---|---|---|---|---|---|
| Efficiency (%) | 89.44 | 90.93 | 92.86 | 93.51 | 93.67 |




LOAD VS Efficiency

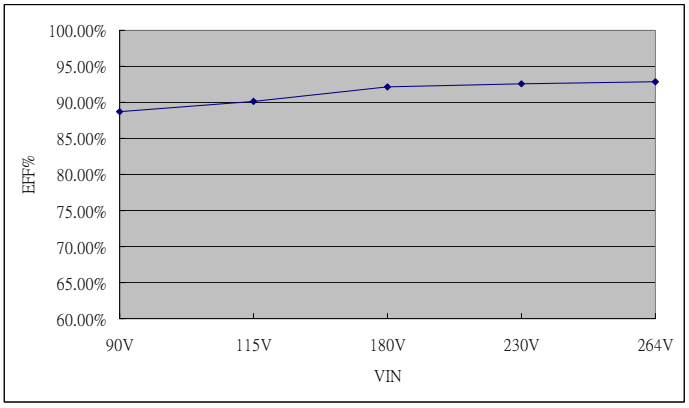
| Load (%) | 0 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|
| 115V (%) | 0 | 76.49 | 85.57 | 88.88 | 91.19 | 91.04 |
| 230V (%) | 0 | 75.50 | 85.84 | 89.81 | 91.73 | 92.09 |
| Load (%) | 60 | 70 | 80 | 90 | 100 | |
| 115V (%) | 91.16 | 91.20 | 91.39 | 91.21 | 90.93 | |
| 230V (%) | 92.91 | 93.48 | 93.80 | 93.94 | 93.51 | |




### AQFV480U-48S

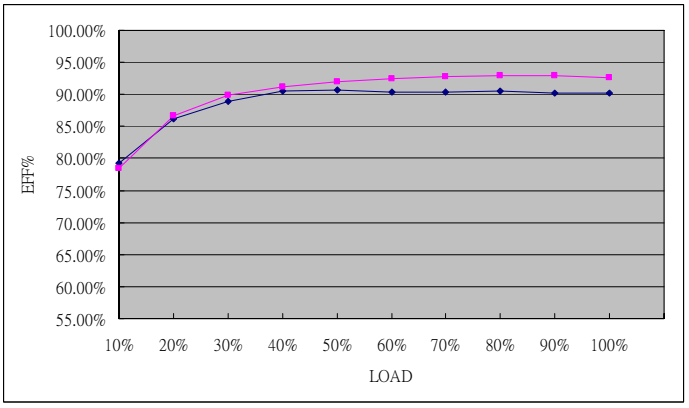
VIN VS Efficiency

| Input Voltage (V) | 90 | 115 | 180 | 230 | 264 |
|---|---|---|---|---|---|
| Efficiency (%) | 88.71 | 90.17 | 92.11 | 92.60 | 92.82 |




LOAD VS Efficiency

| Load (%) | 0 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|
| 115V (%) | 0 | 79.27 | 86.24 | 88.90 | 90.50 | 90.68 |
| 230V (%) | 0 | 78.44 | 86.67 | 89.83 | 91.11 | 91.94 |
| Load (%) | 60 | 70 | 80 | 90 | 100 | |
| 115V (%) | 90.41 | 90.36 | 90.48 | 90.21 | 90.17 | |
| 230V (%) | 92.44 | 92.70 | 92.90 | 92.89 | 92.60 | |



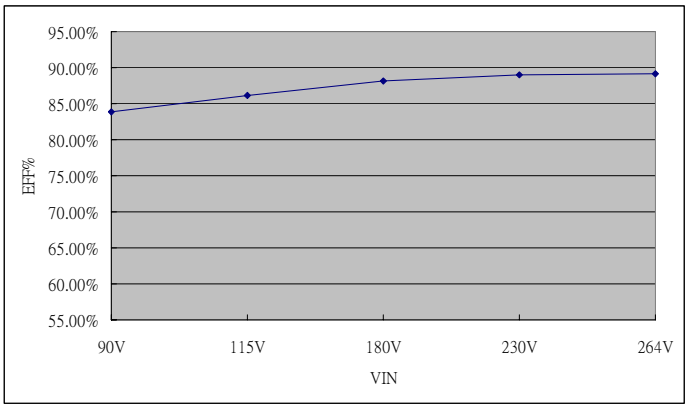
# AQFV480U SERIES (CV Mode) 480 Watts

## EFFICIENCY VERSUS LOAD (with 18CFM FAN)

### AQFV480U-12S

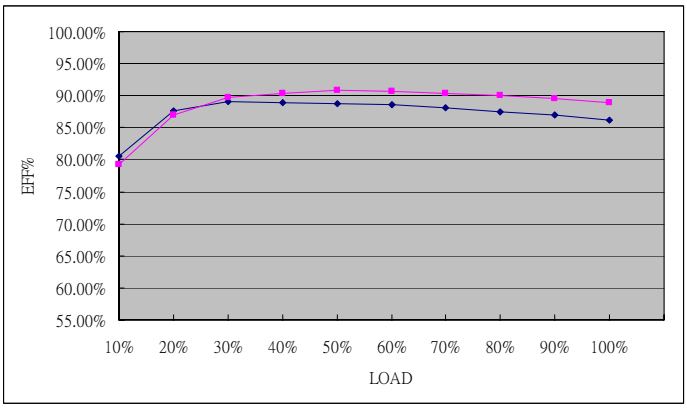
VIN VS Efficiency

| Input Voltage (V) | 90 | 115 | 180 | 230 | 264 |
|---|---|---|---|---|---|
| Efficiency (%) | 83.90 | 86.17 | 88.12 | 88.97 | 89.15 |




LOAD VS Efficiency

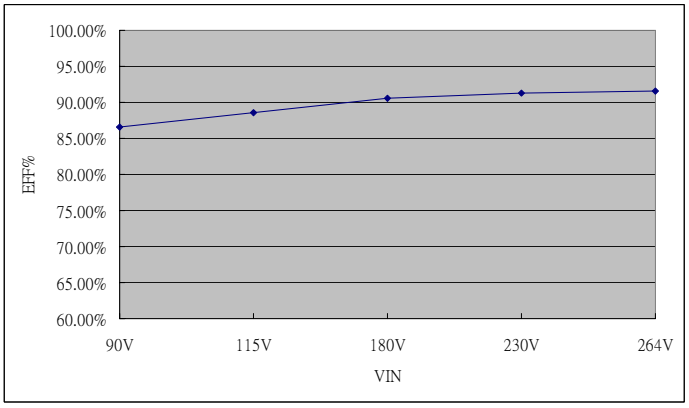
| Load (%) | 0 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|
| 115V (%) | 0 | 80.55 | 87.57 | 89.04 | 88.85 | 88.71 |
| 230V (%) | 0 | 79.24 | 87.06 | 89.66 | 90.39 | 90.81 |
| Load (%) | 60 | 70 | 80 | 90 | 100 | |
| 115V (%) | 88.59 | 88.16 | 87.53 | 86.93 | 86.17 | |
| 230V (%) | 90.62 | 90.38 | 89.98 | 89.55 | 88.97 | |




### AQFV480U-24S

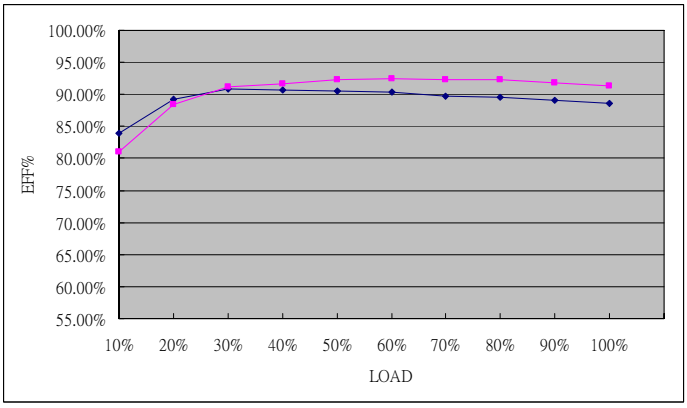
VIN VS Efficiency

| Input Voltage (V) | 90 | 115 | 180 | 230 | 264 |
|---|---|---|---|---|---|
| Efficiency (%) | 86.51 | 88.60 | 90.58 | 91.32 | 91.56 |




LOAD VS Efficiency

| Load (%) | 0 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|
| 115V (%) | 0 | 83.91 | 89.22 | 90.81 | 90.61 | 90.53 |
| 230V (%) | 0 | 81.02 | 88.37 | 91.11 | 91.72 | 92.35 |
| Load (%) | 60 | 70 | 80 | 90 | 100 | |
| 115V (%) | 90.36 | 89.66 | 89.56 | 89.10 | 88.60 | |
| 230V (%) | 92.48 | 92.36 | 92.23 | 91.74 | 91.32 | |



# AQFV480U SERIES (CV Mode) 480 Watts

## EFFICIENCY VERSUS LOAD (with 18CFM FAN)

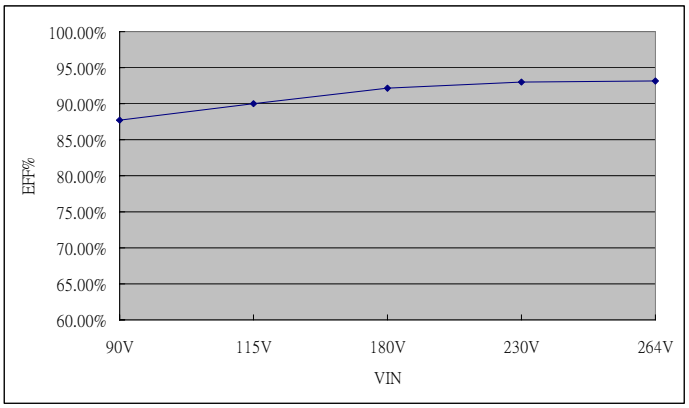
### AQFV480U-36S

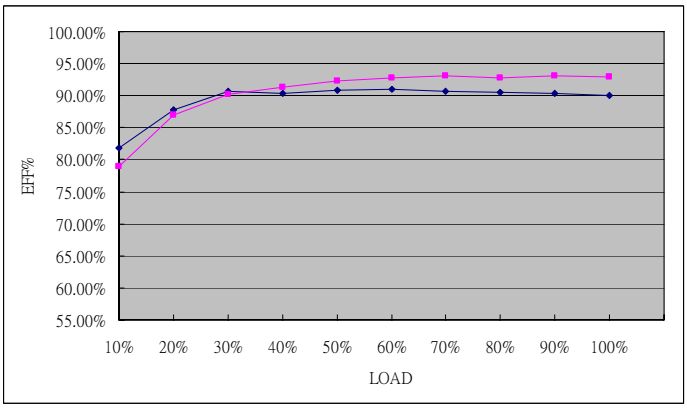
VIN VS Efficiency

| Input Voltage (V) | 90 | 115 | 180 | 230 | 264 |
|---|---|---|---|---|---|
| Efficiency (%) | 87.75 | 89.98 | 92.19 | 92.96 | 93.21 |

LOAD VS Efficiency

| Load (%) | 0 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|
| 115V (%) | 0 | 81.77 | 87.84 | 90.61 | 90.36 | 90.80 |
| 230V (%) | 0 | 78.91 | 87.02 | 90.20 | 91.32 | 92.36 |
| Load (%) | 60 | 70 | 80 | 90 | 100 | |
| 115V (%) | 91.05 | 90.75 | 90.49 | 90.30 | 89.98 | |
| 230V (%) | 92.80 | 93.04 | 92.80 | 93.03 | 92.96 | |




### AQFV480U-48S

VIN VS Efficiency

| Input Voltage (V) | 90 | 115 | 180 | 230 | 264 |
|---|---|---|---|---|---|
| Efficiency (%) | 87.25 | 89.33 | 91.21 | 92.26 | 92.48 |

LOAD VS Efficiency

| Load (%) | 0 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|
| 115V (%) | 0 | 81.82 | 87.48 | 89.68 | 89.51 | 90.09 |
| 230V (%) | 0 | 79.23 | 86.44 | 90.02 | 90.77 | 91.90 |
| Load (%) | 60 | 70 | 80 | 90 | 100 | |
| 115V (%) | 89.92 | 90.07 | 89.75 | 89.78 | 89.33 | |
| 230V (%) | 91.94 | 92.33 | 92.18 | 92.37 | 92.26 | |

