

AVR SERIES

Output Voltages -- 100Vdc up to 1000Vdc at 1 Watt

Miniature, Isolated, and Regulated

The **Series AVR** High Voltage DC-DC Converters is intended for users needing a miniature, isolated, regulated voltage source. These 1 Watt single output units offer high regulation along with low ripple and stability. AVR Units are protected against input Overvoltage, Output Overcurrent and Over Temperature. With no minimum load required, units can be safely operated from No Load to Full Load. Encapsulated in a miniature case and potted, units will operate over a temperature range of -25°C to +70°C with no heatsink or power derating.

These units are suitable for applications like electron beam deflection or focussing, photomultiplier tubes, piezo transducers or any other applications requiring regulated, isolated high-voltage sources.

TYPICAL CHARACTERISTICS:

- Input Voltage Ranges
 - $5 \pm 10\%V_{dc}$
 - $12 \pm 10\%V_{dc}$
 - $24 \pm 10\%V_{dc}$
 - $28 \pm 10\%V_{dc}$
- Input Voltage Shutdown: V_{in} , nom +25% (typical)
- Output Voltage Tolerance: $\pm 0.25\% V_{out}$
- Output Current Limit: I_{out} , max. +30% (typical)
- Output Power: 1 Watt maximum
- Internal Over Temperature Shutdown: 95°C
- Line Regulation: 0.1% V_{out}
- Load Regulation: 0.25% V_{out} (for 0 to 100% load change)
- Output Overshoot: 5% V_{out} (for 50% to 100% load step)
- Output Recovery Time: 30ms (within 1% V_{out})
- Output Ripple: 0.25% V_{out} , peak-peak
- Converter Frequency: 25 to 33kHz
- Isolation: 100 Megohm (min) at 1500V dc
- Temperature Coefficient: .025Vdc/°C (typical)
- Operating Temperature Range: -25°C to +70°C
- Storage Temperature Range: -55°C to +125°C

FEATURES:

- Input/Output Isolation to 1500V
- Output Regulation
- Low Ripple
- 4 standard input voltages: 5, 12, 24, 28 Vdc
- Input Over Voltage Protection
- Output Over Current and Short Circuit Protection
- Remote Shutdown
- 1 Watt output power at 70°C ambient with no heat sink
- Miniature case and low profile (0.500")
- PC mountable
- Consult factory for extended operating temperature range - Special Voltages - Environmental Screening Options - Engineering Assistance -- **Toll Free: 800-431-1064**

NOTE: Data measured at 25°C ambient and V_{in} , nom, after warm-up unless otherwise specified.

AVR SERIES

1 Watt Single Output

| PICO PART # | INPUT | | OUTPUT | | REGULATION | | EFFICIENCY | | RIPPLE Full Load Peak-Peak * (%) | PRICE (US \$) |
|-------------|-------------------|----------------|-------------|----------------|------------|-----------------------|-------------|-------------|----------------------------------|---------------|
| | VOLTAGE RANGE (V) | CURRENT * (mA) | VOLTAGE (V) | MAX. LOAD (mA) | LINE (%) | LOAD * (0 - 100%) (%) | LO LINE (%) | HI LINE (%) | | |

| | | | | | | | | | | | |
|-----------|-------------|-----|------|-----|-----|------|----|----|------|--------|--|
| 5AVR100 | | | | | | | | | | | |
| 5AVR200 | | | | | | | | | | | |
| 5AVR300 | 4.5 - 5.5 | 410 | 100 | 10 | 0.1 | 0.25 | 58 | 46 | 0.25 | 177.63 | |
| 5AVR400 | 4.5 - 5.5 | 410 | 200 | 5.0 | 0.1 | 0.25 | 58 | 46 | 0.25 | 177.63 | |
| 5AVR500 | 4.5 - 5.5 | 410 | 300 | 3.3 | 0.1 | 0.25 | 58 | 46 | 0.25 | 177.63 | |
| 5AVR600 | 4.5 - 5.5 | 410 | 400 | 2.5 | 0.1 | 0.25 | 58 | 46 | 0.25 | 177.63 | |
| 5AVR700 | 4.5 - 5.5 | 410 | 500 | 2.0 | 0.1 | 0.25 | 58 | 46 | 0.25 | 198.46 | |
| 5AVR800 | 4.5 - 5.5 | 410 | 600 | 1.7 | 0.1 | 0.25 | 58 | 46 | 0.25 | 198.46 | |
| 5AVR900 | 4.5 - 5.5 | 410 | 700 | 1.4 | 0.1 | 0.25 | 58 | 46 | 0.25 | 198.46 | |
| 5AVR1000 | 4.5 - 5.5 | 410 | 800 | 1.3 | 0.1 | 0.25 | 58 | 46 | 0.25 | 226.63 | |
| | 4.5 - 5.5 | 410 | 900 | 1.1 | 0.1 | 0.25 | 58 | 46 | 0.25 | 226.63 | |
| | 4.5 - 5.5 | 410 | 1000 | 1.0 | 0.1 | 0.25 | 58 | 46 | 0.25 | 226.63 | |
| 12AVR100 | 10.5 - 13.5 | 165 | 100 | 10 | 0.1 | 0.25 | 63 | 49 | 0.25 | 177.63 | |
| 12AVR200 | 10.5 - 13.5 | 165 | 200 | 5.0 | 0.1 | 0.25 | 63 | 49 | 0.25 | 177.63 | |
| 12AVR300 | 10.5 - 13.5 | 165 | 300 | 3.3 | 0.1 | 0.25 | 63 | 49 | 0.25 | 177.63 | |
| 12AVR400 | 10.5 - 13.5 | 165 | 400 | 2.5 | 0.1 | 0.25 | 63 | 49 | 0.25 | 177.63 | |
| 12AVR500 | 10.5 - 13.5 | 165 | 500 | 2.0 | 0.1 | 0.25 | 63 | 49 | 0.25 | 198.46 | |
| 12AVR600 | 10.5 - 13.5 | 165 | 600 | 1.7 | 0.1 | 0.25 | 63 | 49 | 0.25 | 198.46 | |
| 12AVR700 | 10.5 - 13.5 | 165 | 700 | 1.4 | 0.1 | 0.25 | 63 | 49 | 0.25 | 198.43 | |
| 12AVR800 | 10.5 - 13.5 | 165 | 800 | 1.3 | 0.1 | 0.25 | 63 | 49 | 0.25 | 226.63 | |
| 12AVR900 | 10.5 - 13.5 | 165 | 900 | 1.1 | 0.1 | 0.25 | 63 | 49 | 0.25 | 226.63 | |
| 12AVR1000 | 10.5 - 13.5 | 165 | 1000 | 1.0 | 0.1 | 0.25 | 63 | 49 | 0.25 | 226.63 | |
| 24AVR100 | 21 - 27 | 80 | 100 | 10 | 0.1 | 0.25 | 65 | 50 | 0.25 | 177.63 | |
| 24AVR200 | 21 - 27 | 80 | 200 | 5.0 | 0.1 | 0.25 | 65 | 50 | 0.25 | 177.63 | |
| 24AVR300 | 21 - 27 | 80 | 300 | 3.3 | 0.1 | 0.25 | 65 | 50 | 0.25 | 177.63 | |
| 24AVR400 | 21 - 27 | 80 | 400 | 2.5 | 0.1 | 0.25 | 65 | 50 | 0.25 | 177.63 | |
| 24AVR500 | 21 - 27 | 80 | 500 | 2.0 | 0.1 | 0.25 | 65 | 50 | 0.25 | 198.46 | |
| 24AVR600 | 21 - 27 | 80 | 600 | 1.7 | 0.1 | 0.25 | 65 | 50 | 0.25 | 198.46 | |
| 24AVR700 | 21 - 27 | 80 | 700 | 1.4 | 0.1 | 0.25 | 65 | 50 | 0.25 | 198.46 | |
| 24AVR800 | 21 - 27 | 80 | 800 | 1.3 | 0.1 | 0.25 | 65 | 50 | 0.25 | 226.63 | |
| 24AVR900 | 21 - 27 | 80 | 900 | 1.1 | 0.1 | 0.25 | 65 | 50 | 0.25 | 226.63 | |
| 24AVR1000 | 21 - 27 | 80 | 1000 | 1.0 | 0.1 | 0.25 | 65 | 50 | 0.25 | 226.63 | |
| 28AVR100 | 25 - 32 | 65 | 100 | 10 | 0.1 | 0.25 | 65 | 50 | 0.25 | 177.63 | |
| 28AVR200 | 25 - 32 | 65 | 200 | 5.0 | 0.1 | 0.25 | 65 | 50 | 0.25 | 177.63 | |
| 28AVR300 | 25 - 32 | 65 | 300 | 3.3 | 0.1 | 0.25 | 65 | 50 | 0.25 | 177.63 | |
| 28AVR400 | 25 - 32 | 65 | 400 | 2.5 | 0.1 | 0.25 | 65 | 50 | 0.25 | 177.63 | |
| 28AVR500 | 25 - 32 | 65 | 500 | 2.0 | 0.1 | 0.25 | 65 | 50 | 0.25 | 198.46 | |
| 28AVR600 | 25 - 32 | 65 | 600 | 1.7 | 0.1 | 0.25 | 65 | 50 | 0.25 | 198.46 | |
| 28AVR700 | 25 - 32 | 65 | 700 | 1.4 | 0.1 | 0.25 | 65 | 50 | 0.25 | 198.46 | |
| 28AVR800 | 25 - 32 | 65 | 800 | 1.3 | 0.1 | 0.25 | 65 | 50 | 0.25 | 226.63 | |
| 28AVR900 | 25 - 32 | 65 | 900 | 1.1 | 0.1 | 0.25 | 65 | 50 | 0.25 | 226.63 | |
| 28AVR1000 | 25 - 32 | 65 | 1000 | 1.0 | 0.1 | 0.25 | 65 | 50 | 0.25 | 226.63 | |

All specifications are given under the following conditions: +25°C ambient and full load

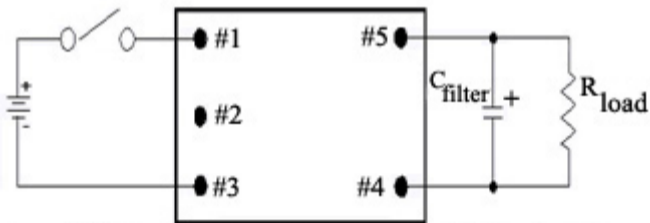
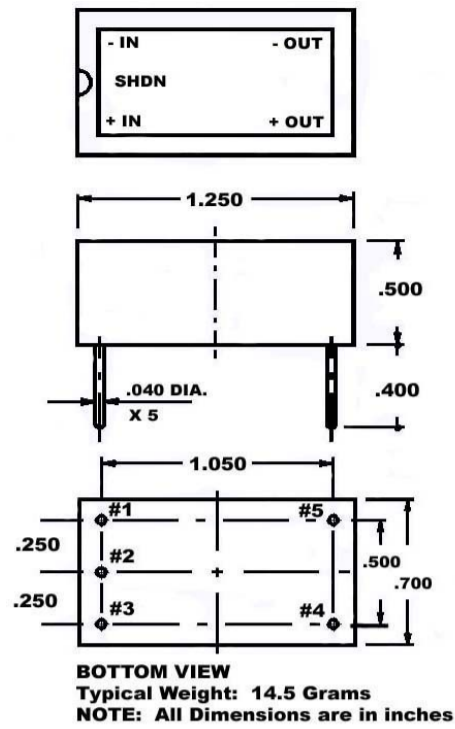
Measurements taken after warm up

* At nominal input voltages

SERIES AVR

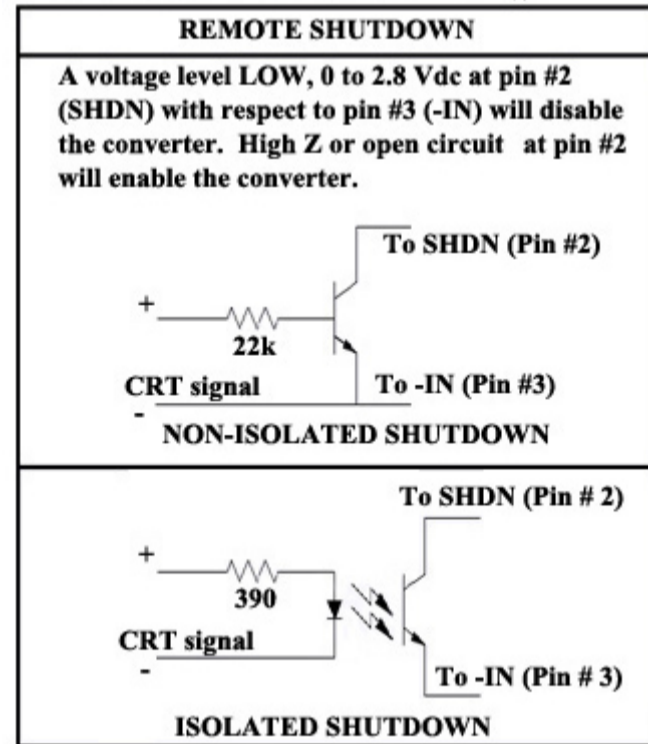
| PIN # | FUNCTION |
|-------|----------|
| 1 | + Input |
| 2 | Shutdown |
| 3 | -Input |
| 4 | -Output |
| 5 | +Output |

SERIES AVR

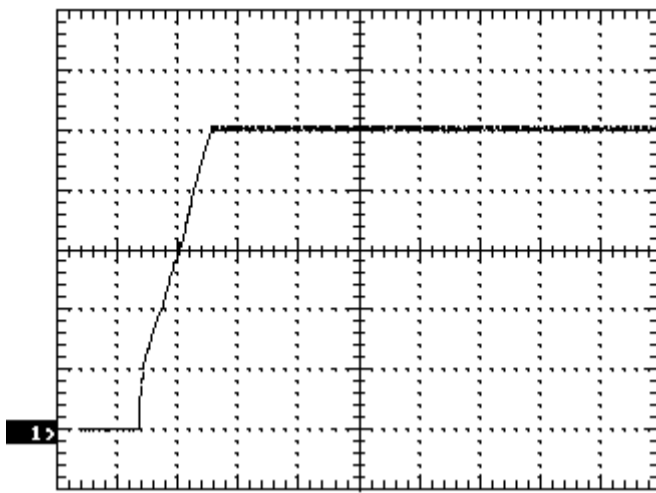


Additional ripple reduction can be obtained by using external output capacitors, C_{filter}

TO SHUT DOWN THE UNIT, THE VOLTAGE BETWEEN PINS 2 AND 3 MUST BE 0.28 VDC OR LESS. THE UNIT WILL AUTOMATICALLY RESTART WHEN THE CIRCUIT BETWEEN PINS 2 AND 3 IS OPEN. PLEASE REVIEW THE TYPICAL EXAMPLES OF SHUT DOWN CIRCUITS BELOW.



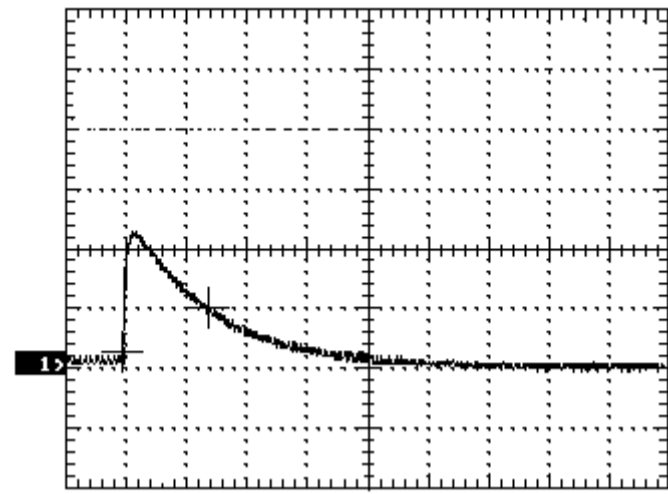
TYPICAL START UP RESPONSE



Channel 1: 200 Volt/division; 10 ms/division

Unit Tested: 5AVR1000 (5 Vin, 1000 Vout) operated at full load.

TYPICAL TRANSIENT RESPONSE



Channel 1: 5 Volt/division, 20 ms/division

Load Change: 100% to 0% full load
Recovery time within 0.5% Vout: 28.7ms

Unit Tested: 5AVR1000 (5 Vin, 1000 Vout).

For immediate engineering assistance or to place an order:

Call Toll Free: 800-431-1064

PICO Electronics, Inc.

143 Sparks Ave., Pelham, N.Y. 10803
Tel: 914-738-1400 or Fax: 914-738-8225

[Go back to Low Profile DC-DC Converter Menu](#) [1]

[Go back to Hi-Voltage DC-DC Converter Menu](#) [2]