



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 $+70^{\circ}\text{C}$ 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.

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

TYPICAL CHARACTERISTICS:

- Input Voltage Ranges
 - $5 \pm 10\% \text{Vdc}$
 - $12 \pm 10\% \text{Vdc}$
 - $24 \pm 10\% \text{Vdc}$
 - $28 \pm 10\% \text{Vdc}$
- 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: $0.1\% V_{out}$

- 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**
- Load Regulation: 0.25% Vout (for 0 to 100% load change)
- Output Overshoot: 5% Vout (for 50% to 100% load step)
- Output Recovery Time: 30ms (within 1% Vout)
- Output Ripple: 0.25% Vout, 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

NOTE: Data measured at 25°C ambient and Vin, 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
	VOLTAGE RANGE (V)	CURRENT * (mA)	VOLTAGE (V)	MAX. LOAD (mA)	LINE (%)	LOAD * (0 - 100%) (%)	LO LINE (%)	HI LINE (%)		
5AVR100	4.5 - 5.5	410	100	10	0.1	0.25	58	46	0.25	155.15
5AVR200	4.5 - 5.5	410	200	5.0	0.1	0.25	58	46	0.25	155.15
5AVR300	4.5 - 5.5	410	300	3.3	0.1	0.25	58	46	0.25	155.15
5AVR400	4.5 - 5.5	410	400	2.5	0.1	0.25	58	46	0.25	155.15
5AVR500	4.5 - 5.5	410	500	2.0	0.1	0.25	58	46	0.25	173.34
5AVR600	4.5 - 5.5	410	600	1.7	0.1	0.25	58	46	0.25	173.34
5AVR700	4.5 - 5.5	410	700	1.4	0.1	0.25	58	46	0.25	173.34
5AVR800	4.5 - 5.5	410	800	1.3	0.1	0.25	58	46	0.25	197.95
5AVR900	4.5 - 5.5	410	900	1.1	0.1	0.25	58	46	0.25	197.95
5AVR1000	4.5 - 5.5	410	1000	1.0	0.1	0.25	58	46	0.25	197.95
12AVR100	10.5 - 13.5	165	100	10	0.1	0.25	63	49	0.25	155.15
12AVR200	10.5 - 13.5	165	200	5.0	0.1	0.25	63	49	0.25	155.15
12AVR300	10.5 - 13.5	165	300	3.3	0.1	0.25	63	49	0.25	155.15
12AVR400	10.5 - 13.5	165	400	2.5	0.1	0.25	63	49	0.25	155.15

12AVR500	10.5 - 13.5	165	500	2.0	0.1	0.25	63	49	0.25	173.34
12AVR600	10.5 - 13.5	165	600	1.7	0.1	0.25	63	49	0.25	173.34
12AVR700	10.5 - 13.5	165	700	1.4	0.1	0.25	63	49	0.25	173.34
12AVR800	10.5 - 13.5	165	800	1.3	0.1	0.25	63	49	0.25	197.95
12AVR900	10.5 - 13.5	165	900	1.1	0.1	0.25	63	49	0.25	197.95
12AVR1000	10.5 - 13.5	165	1000	1.0	0.1	0.25	63	49	0.25	197.95
24AVR100	21 - 27	80	100	10	0.1	0.25	65	50	0.25	155.15
24AVR200	21 - 27	80	200	5.0	0.1	0.25	65	50	0.25	155.15
24AVR300	21 - 27	80	300	3.3	0.1	0.25	65	50	0.25	155.15
24AVR400	21 - 27	80	400	2.5	0.1	0.25	65	50	0.25	155.15
24AVR500	21 - 27	80	500	2.0	0.1	0.25	65	50	0.25	173.34
24AVR600	21 - 27	80	600	1.7	0.1	0.25	65	50	0.25	173.34
24AVR700	21 - 27	80	700	1.4	0.1	0.25	65	50	0.25	173.34
24AVR800	21 - 27	80	800	1.3	0.1	0.25	65	50	0.25	197.95
24AVR900	21 - 27	80	900	1.1	0.1	0.25	65	50	0.25	197.95
24AVR1000	21 - 27	80	1000	1.0	0.1	0.25	65	50	0.25	197.95
28AVR100	25 - 32	65	100	10	0.1	0.25	65	50	0.25	155.15
28AVR200	25 - 32	65	200	5.0	0.1	0.25	65	50	0.25	155.15
28AVR300	25 - 32	65	300	3.3	0.1	0.25	65	50	0.25	155.15
28AVR400	25 - 32	65	400	2.5	0.1	0.25	65	50	0.25	155.15
28AVR500	25 - 32	65	500	2.0	0.1	0.25	65	50	0.25	173.34
28AVR600	25 - 32	65	600	1.7	0.1	0.25	65	50	0.25	173.34
28AVR700	25 - 32	65	700	1.4	0.1	0.25	65	50	0.25	173.34
28AVR800	25 - 32	65	800	1.3	0.1	0.25	65	50	0.25	197.95
28AVR900	25 - 32	65	900	1.1	0.1	0.25	65	50	0.25	197.95
28AVR1000	25 - 32	65	1000	1.0	0.1	0.25	65	50	0.25	197.95

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

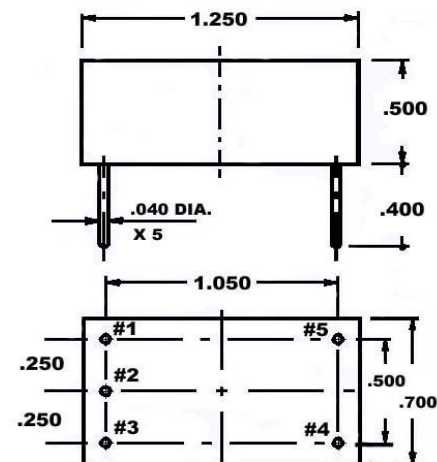
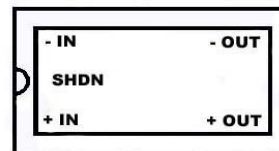
Measurements taken after warm up

* At nominal input voltages

SERIES AVR

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

SERIES AVR

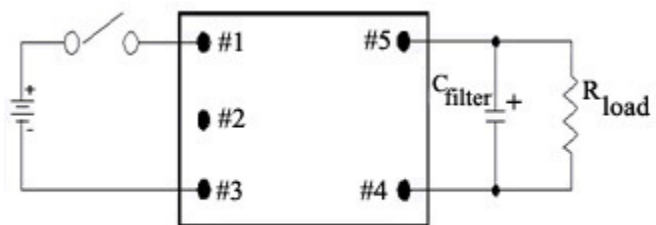


BOTTOM VIEW

Typical Weight: 14.5 Grams

NOTE: All Dimensions are in inches

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.

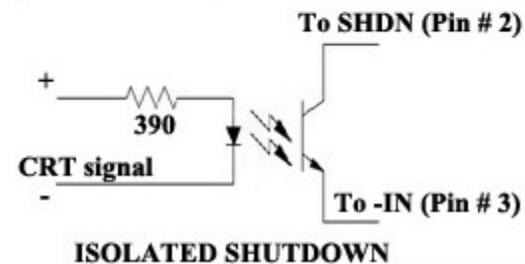
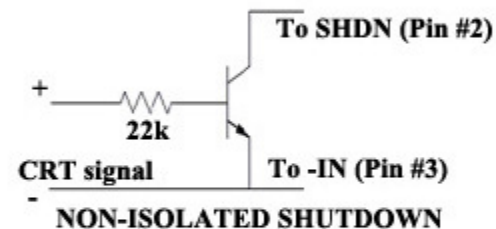


Additional ripple reduction can be obtained by using external output capacitors, C_{filter}

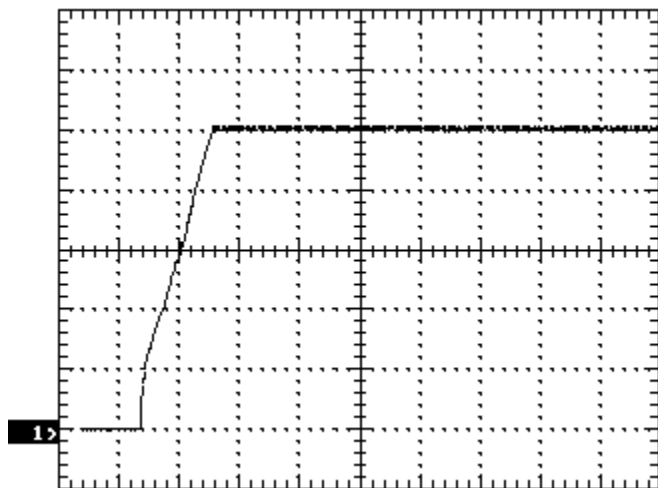
TYPICAL START UP RESPONSE

REMOTE SHUTDOWN

A voltage level **LOW**, 0 to 2.8 Vdc at pin #2 (SHDN) with respect to pin #3 (-IN) will disable the converter. High Z or open circuit at pin #2 will enable the converter.

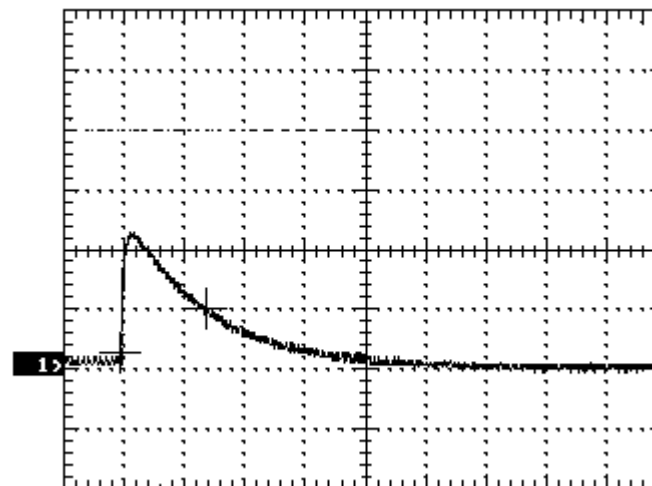


TYPICAL TRANSIENT RESPONSE



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

Unit Tested: 5AVR1000 (5 V_{in}, 1000 V_{out}) operated at full load.



Channel 1: 5 Volt/division, 200 ms/division

Load Change: 100% to 0% full load
Recovery time within 0.5% V_{out}: 28.7ms

Unit Tested: 5AVR1000 (5 V_{in}, 1000 V_{out}).

For immediate engineering assistance or to place an order:

Call Toll Free: 800-431-1064

PICO Electronics, Inc.

143 Sparks Ave., Pelham, N.Y. 10803-1837

Tel: 914-738-1400 or Fax: 914-738-8225

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