

## DC-DC Converter AVP/J and AVP/K

### Output power up to 75 Watts

Isolated – Single Output  
PCB Mounting

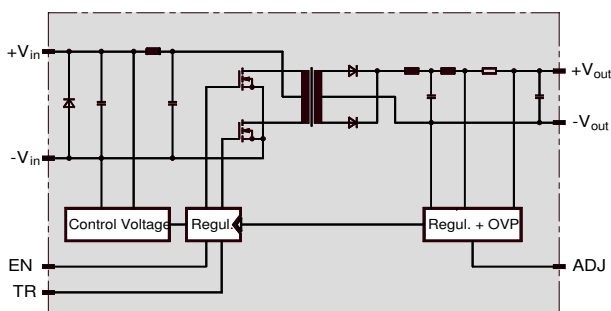


AVP/J



AVP/K

### Block Diagram



### Technology

- MOSFET design
- Regulators in surface mount technology

### Special Features

- Burst transients according to EN 61000-4-4:2004 (class 3): 2 kV
- Surge according to EN 61000-4-5:2006: 0,5 kV symmetric
- Conducted immunity according to EN 61000-4-6:2007
- Conducted emission: Input filtering according to EN 55022:2006, class A\* (AVP/K)
- Reverse polarity protection (by external fuse)
- Zero load operation and short circuit protected
- Parallel and series connection
- Overtemperature shutdown
- No overshoot of output voltage at switching on
- Remote off (EN) with TTL – L-signal
- Overvoltage protection in the output circuit, even in case of external supply (OVP)
- Extremely low thermal stress of sensitive components due to dissipated power loss over mounting surface
- Vibration resistant and indifferent to humidity due to encapsulated case

### Specifications

at  $\vartheta_{amb}=25^{\circ}\text{C}$ ,  $V_{in\ nom}$ ,  $0,62 I_{out\ nom}$

#### Temperature

Ambient air	$\vartheta_{amb}$	= -40 °C...+85 °C
Storage	$\vartheta_S$	= -40 °C...+100 °C
Rise in case	$\Delta \vartheta_{C\ perm}$	≤ 20 K
Permissible rise on heat sink	$\Delta \vartheta_B\ perm$	≤ 25 K

#### Output voltages

Tolerance (AVP/Ks)	$\Delta V_{out}$	≤ ±0,25 (0,5)%**
Ripple at $\vartheta_{amb} = -40^{\circ}\text{C}...+85^{\circ}\text{C}$	$V_{out\ ripple}$	≤ 3,5%
Temperature coefficient	TC	≤ 0,016%/K

#### Regulation at $\vartheta_{amb} = -40^{\circ}\text{C}...+85^{\circ}\text{C}$

Line reg. for $V_{in\ range}$	$\Delta V_{out}$	≤ 2mV
Load reg. static	$\Delta V_{out}$	≤ 0,6mV/A
Load change (25 °C)** for AVP/J	$\Delta V_{out}$	≤ 100 (50)mV/A
for AVP/K		≤ 35 (50)mV/A

#### OVP

Starting point /%	$V_{out\ off}$	≤ 130% $V_{out\ nom}$
Admissible continuous external current /ext		≤ 2,5/3,5A

#### Isolation – voltage strength

In-/Output		≥ 1,5 kVrms
Input to base plate		≥ 1,5 kVrms
Output to base plate		≥ 0,5 kVrms
Resistance	$R_{iso}$	≥ 1,5 GOhm
Capacitance	$C_{iso}$	≥ 2200 pF

#### Weight AVP/J / AVP/K

$M$	ca. 260/330g
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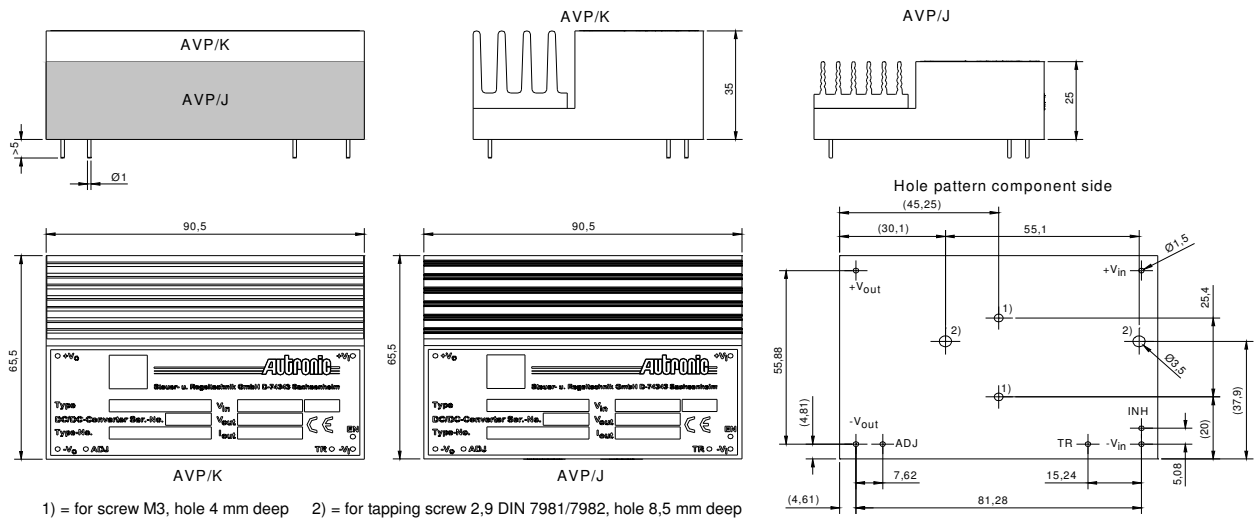
\* In built-in condition our devices may show different EMC properties

\*\* At 3,3 V and 5 V double values

\*\*\*  $I_{out\ min} = 0,1 I_{out\ nom}$

## Drawings

1. Dimensions in mm
2. Unless otherwise specified, general tolerances  $\pm 0,5$  are for values in brackets (XX)  
Values not in brackets are according to ISO-2768-m



## Operating Instructions

**Installation:** The converters have to be installed according to the guidelines currently in force, like other open electronic component assemblies. Attention must be paid to sufficient ventilation, fastening and protection against accidental contact!

**Reverse polarity protection:** If reverse polarity connection of the input voltage can not be excluded, an external time-lag fuse must be installed. Size:  $I_{\text{rat}} = 1,5 \times I_{\text{in max}}$  (max. 16 A). Pay attention on sufficient current of current in source in case of short-circuit.

**Excess temperature protection:** In case temperature exceeds  $101\text{ }^{\circ}\text{C}$ , typ.  $105\text{ }^{\circ}\text{C}$ , (due to inadmissible operation conditions) the output voltage is automatically switched off and restarted after cooling down about  $10\text{ K}$ .

**Overvoltage protection:** Externally or internally caused overvoltage at the output leads to a thyristor-controlled short-circuit and shutdown of the output. After elimination of the overvoltage the output voltage restarts automatically.

**External shut down (EN):**  $V < 0,8\text{ V}$  at pin "EN" to pin  $-V_{\text{in}}$  switches off the output.  $I_{\text{source}} 500\mu\text{A}$ .

**Current limiting:**  $I_{\text{out lim}} = 1,1 \dots 1,2 I_{\text{out nom}}$ . At more than  $1,5 I_{\text{out nom}}$ , the output switches off and restarts automatically latest after 1s of elimination of the overload.

**Tracking operation:** If the TR pins of two or more converters are connected, the output voltages in case of short-circuit or overload go synchronously down.

**Adjustment:** Connection of the pin "ADJ" with the negative output pin increases the output voltage of about 8%. Intermediate values are obtained by means of a resistor. By connecting pin "ADJ" with the positive output pin over a resistor, the output may be lowered by max. 8%.

## Standard converters AVP/J and AVP/K

V <sub>out</sub> V	V <sub>in nom</sub> V	V <sub>in range</sub> V	AVP/J (25...42 Watts)				AVP/K (38...75 Watts)				Order Number			
			I <sub>out nom</sub> <sup>2)</sup> A	I <sub>in max</sub> A	η <sup>3)</sup> %	f kHz	I <sub>out nom</sub> <sup>2)</sup> A	I <sub>in max</sub> A	η <sup>3)</sup> %	f kHz				
3,3 <sup>1)</sup>	12/24	5...36 <sup>4)</sup>	-	-	-	-	-	-	-	10	10	72	67	09 09 80 0112 6
5 <sup>1)</sup>	12/24	5...36 <sup>4)</sup>	4,8	6,4	79	67	09 16 81 0112 3	7,2	10	80	67	09 09 81 0112 5		
	12/24	9...40	5,6	4,0	82		09 16 61 0112 7	8,8	6,4	82		09 09 61 0112 9		
	24	15...36	6,4	2,7	83		09 16 91 0112 1	9,6	4,0	84		09 09 91 0112 3		
	48	32...74	6,4	1,3	82		09 16 51 0112 9	10	2,1	84		09 09 51 0112 2		
	110	66...154	6,4	0,7	82		09 16 71 0112 5	10	1,1	85		09 09 71 0112 7		
12	12/24	5...36 <sup>4)</sup>	1,9	6,3	79	67	09 16 82 0112 2	2,9	9,5	80	67	09 09 82 0112 4		
	12/24	9...40	2,7	4,5	83		09 16 62 0112 6	3,5	6,7	84		09 09 62 0112 8		
	24	15...36	3,2	2,9	85		09 16 92 0112 9	4,8	4,5	86		09 09 92 0112 2		
	48	32...74	3,2	1,5	86		09 16 52 0112 8	4,8	2,1	89		09 09 52 0112 1		
	72	43...101	3,2	1,1	86		09 16 22 0112 5	4,8	1,6	89		09 09 22 0112 7		
	110	66...154	3,2	0,8	85		09 16 72 0112 4	4,8	1,1	90		09 09 72 0112 6		
15	12/24	5...36 <sup>4)</sup>	1,5	5,9	79	67	09 16 83 0112 1	2,6	10	81	67	09 09 83 0112 3		
	12/24	9...40	2,1	4,3	84		09 16 63 0112 5	3,4	6,9	85		09 09 63 0112 7		
	24	15...36	2,6	3,1	86		09 16 93 0112 8	4,5	5,1	89		09 09 93 0112 1		
	48	32...74	2,6	1,5	85		09 16 53 0112 7	4,5	2,4	88		09 09 53 0112 9		
	110	66...154	2,6	0,8	85		09 16 73 0112 3	4,5	1,1	90		09 09 73 0112 5		
24	12/24	5...36 <sup>4)</sup>	1,0	6,3	80	67	09 16 84 0112 9	1,6	10	81	67	09 09 84 0112 2		
	12/24	9...40	1,4	4,7	83		09 16 64 0112 4	2,3	7,4	85		09 09 64 0112 6		
	24	15...36	1,6	3,0	87		09 16 94 0112 7	3,2	5,9	89		09 09 94 0112 9		
	48	32...74	1,6	1,5	87		09 16 54 0112 6	3,2	2,7	90		09 09 54 0112 8		
	72	43...101	1,6	1,1	87		09 16 24 0112 3	3,2	2,1	90		09 09 24 0112 5		
	110	66...154	1,6	0,8	86		09 16 74 0112 2	3,2	1,3	90		09 09 74 0112 4		
30	12/24	5...36 <sup>4)</sup>	0,8	6,3	80	67	09 16 85 0112 8	1,6	13	81	67	09 09 85 0112 1		
	12/24	9...40	1,1	4,7	84		09 16 65 0112 3	2,2	9,2	85		09 09 65 0112 5		
	24	15...36	1,4	3,4	86		09 16 95 0112 6	2,5	5,8	90		09 09 95 0112 8		
	48	32...74	1,4	1,6	87		09 16 55 0112 5	2,5	2,7	91		09 09 55 0112 7		
	110	66...154	1,4	0,8	87		09 16 75 0112 1	2,5	1,3	91		09 09 75 0112 3		

1) Adjusted to 3,4 resp. 5,1 V

2) For  $\vartheta_{amb} = -40^{\circ}\text{C} \dots 85^{\circ}\text{C}$  at flowing air. (> 0,6 m/s velocity, airflow parallel to the heatsink fins)  
At still air and  $\vartheta_{amb}$  from 55°C to 85°C derating 1,25%/°C  
At  $\vartheta_{amb}$  between 85°C and 95°C linear decreasing to 0 A

3) At V<sub>in nom</sub> and 0,6 I<sub>out nom</sub>

4) Converter switches on at V<sub>in</sub> > 8 V

In case of operation at V<sub>in</sub> < 7 V 10% basic load is required

Models in blue are not recommended for new designs.

Models in red are obsolete.

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