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Autronic
Steuer- und Regeltechnik / Sachsenheim

DC-DC Converter AVP/KE-S
Output power up to 100 Watts

Isolated – Single Output
Standard euro-rack size 19”

Special Features

- Electrostatic discharge: 8kV contact (chassis), 15 kV air, (level 4) according to EN 61000-4-2:2009
- Fast transients (Burst): 2 kV (level 3) / (criterion A) / according to EN 61000-4-4:2004
- Surge: Input immunity 2 kV sym./asym. criterion A according to EN 61000-4-5:2006
- Conducted immunity 10V according to EN 61000-4-6:2007
- Conducted emission: Input filtering according to EN 55022:2006 class B****
- Zero load operation and short circuit protection
- Overtemperature shutdown
- Remote off (EN) with TTL – L-signal
- Overvoltage protection in the output, even in case of external supply (OVP)
- Reverse polarity protection by internal fuse (diode at V_{in} = 110V)
- Extremly low thermal stress of sensitive components due to dissipated power loss over lateral heatsink
- Yellow LED indicate operating mode

Technology

- Power section in 100kHz-MOS-FET-technology
- Regulator section in SMT
- Coated assembly
- Coated and glued parts for better vibration resistance

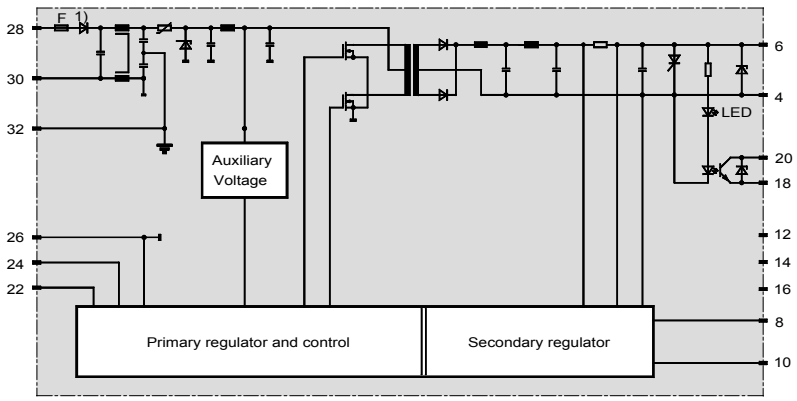
Specifications

at ϑ_{amb}=25°C, $V_{in\ nom}$, $I_{out\ nom}$

Temperature		
Ambient air	ϑ_{amb}	= -40°C...+85°C
Storage	ϑ_S	= -40°C...+100°C
Rise inside chassis	$\Delta\vartheta_{Ci}$	≤ 20 K
Rise on heat sink	$\Delta\vartheta_K$	≤ 35 K
Output voltage		
Tolerance	ΔV_{out}	≤ ±0,5 %*
Ripple at ϑ_{amb} = -40°C...+85°C	$V_{out\ ripple}$	≤ 3,5 %
Temperature coefficient	TC	≤ 0,016 %/K
Regulation at ϑ_{amb} = -40°C...+85°C		
Line reg. for $V_{in\ range}$	ΔV_{out}	≤ 2 mV
Load reg. static	ΔV_{out}	≤ 10 mV/A
Load change (25°C)**	ΔV_{out}	≤ 55 (45) mV/A
Output “Power Good”		
Admissible voltage	V_{CEO}	≤ 24 V
Admissible current	I_C	≤ 20 mA
Saturation voltage	$V_{CE(sat)}$	≤ 1,2 V
OVP		
Starting point /%	$V_{out\ off}$	≤ 130 % $V_{out\ nom}$
Admissible continuous external current	I_{ext}	≤ 6 A
Isolation voltage-strength		
In-/Output	$V_{iso\ i/o}$	≥ 1,5 kVrms
Input to case	$V_{iso\ i/c}$	≥ 1,5 kVrms
Output to case	$V_{iso\ i/c}$	≥ 0,5 kVrms
Resistance In-/Output	R_{iso}	≥ 1,5 GOhm
Capacitance In-/Output	C_{iso}	≤ 7000 (4200) pF
Degrees of protection (inserted in rack)		= IP20***
Weight	M	ca. 815 g

Block Diagram

4 = $-V_{out}$
6 = $+V_{out}$
8 = +S (Sense)
10 = -S (Sense)
12 = n.c.
14 = n.c.
16 = n.c.
18 = -PG (-Power Good)
20 = +PG (+Power Good)
22 = TR (Tracking)
24 = EN (ON/OFF)
26 = GND (TR and EN)
28 = $+V_{in}$
30 = $-V_{in}$
32 = ⏚ / ⏚
Sense connection is not required.



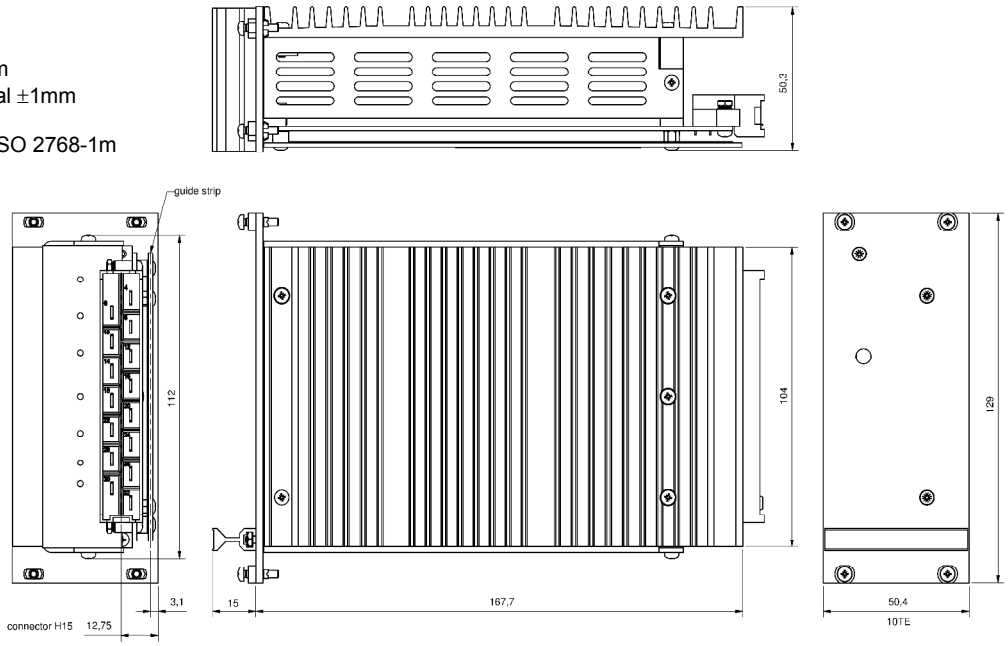
1) only at $V_{in\ nom}$ = 110V

* At 5V: 1%
** $I_{out\ min}$ = 0,1 $I_{out\ nom}$
***Higher degrees of protection by properly mounting
**** In built-in condition our devices may show different EMC properties

Drawing

Dimensions in mm
Tolerance: general ±1mm

Front panel DIN ISO 2768-1m



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! Plug in not under voltage if converter connected parallel or in series.
Reverse polarity protection: The converters are equipped with a soldered-in time-lag fuse corresponding to IEC 127-2 for input protection. For rating of fuse refer to listing below. Pay attention on sufficient current of current source in case of short-circuit.
Connector pin 32 (⏚/⏚) - Equipotentiality/PE: This pin has to be properly connected in order to assure operation.
Excess temperature protection: In case of inside temperatures exceeding >101°C, typ. 105°C, (due to inadmissible operation contitions) the output voltages are automatically switched off and restarted after cooling down about 10K.
External shutdown (EN): V< 0,8 V at pin 24 (EN) to pin 26 or connecting an active transistor with open collector to this pins switches off the output. I_{source} 500 µA
Overvoltage protection: Externally or internally caused overvoltage at the output leads to a thyristor controlled short-circuit of the output. After elimination of the overvoltage the output voltage restarts automatically latest after 1s.
Output voltage monitoring (Power Good): Simultan to the lighting of a LED a transistor with open-collector switches on. Level V_{PG} see table below.
Current limiting: $I_{out\,lim}$ = 1,1...1,2 $I_{out\,nom}$. At more than 1,5 $I_{out\,nom}$ the output switches off and restarts automatically latest after 1s of elimination of the overload.
Tracking operation: If the pins 22 as well as 26 of two or more converters are connected, the output voltages in case of short-circuit or overload goes synchronously down and restarts at the same moment.
Sense operation: Sense connection is not required. If it is accomplished, the voltage at the load is reduced by approx. 100 mV. The voltage drop on the interconnection leads between the converter and the load should not exceed 0,5 V.

Standard converters AVP/KE-S

V_{out} V	I_{out} [2] A	η [3] %	V_{PG} [5] VDC	$V_{in\ nom}$ VDC	$V_{in\ Operating}$ VDC	$V_{in\ Range}$ VDC	$I_{in\ max}$ A	Internal Fuse	Order Number
5 [1]	7,5	79	> 3,5	12/24 [4]	9…30	9…40 [4]	11	16	09 54 61 0102 1
	10	80		24	16,8…30	15…36	8	16	09 54 91 0102 4
	10	81		36	24,2…45	19…51	6	10	09 54 31 0102 7
	10	84		48	33…30	32…74	3,5	6,3	09 54 51 0102 3
	10	85		72	50…90	43,2…101	2,6	3,6	09 54 21 0102 9
	10	85		110	77…138	66…154	1,7	2,5	09 54 71 0102 8
12	6	80	> 9,5	12/24 [4]	9…30	9…40 [4] [6]	11	16	09 54 62 0102 9
	8	83		24	16,8…30	15…36	8	16	09 54 92 0102 3
	8	84		36	24,2…45	19…51	6	10	09 54 32 0102 6
	8	86		48	33…30	32…74	3,5	6,3	09 54 52 0102 2
	8	87		72	50…90	43,2…101	2,6	3,6	09 54 22 0102 8
	8	87		110	77…138	66…154	1,7	2,5	09 54 72 0102 7
15	4,9	81	> 13	12/24 [4]	9…30	9…40 [4] [6]	11	16	09 54 63 0102 8
	6,5	83		24	16,8…30	15…36	8	16	09 54 93 0102 2
	6,5	85		36	24,2…45	19…51	6	10	09 54 33 0102 5
	6,5	86		48	33…30	32…74	3,5	6,3	09 54 53 0102 1
	6,5	87		72	50…90	43,2…101	2,6	3,6	09 54 23 0102 7
	6,5	87		110	77…138	66…154	1,7	2,5	09 54 73 0102 6
24	3	82	> 21	12/24 [4]	9…30	9…40 [4]	11	16	09 54 64 0102 7
	4	84		24	16,8…30	15…36	8	16	09 54 94 0102 1
	4	85		36	24,2…45	19…51	6	10	09 54 34 0102 4
	4	86		48	33…30	32…74	3,5	6,3	09 54 54 0102 9
	4	87		72	50…90	43,2…101	2,6	3,6	09 54 24 0102 6
	4	87		110	77…138	66…154	1,7	2,5	09 54 74 0102 5 [7]

Reference numbers for option “EMC fingerstrips” and other options on request

1) Adjusted to 5,1V
2) At -40°C…+70°C
Derating: between 70°C and 85°C: 4%/°C
3) Typical at $V_{in\ nom}$
4) Output current 75% of the table values
5) V_{Pg} = Switching point for the output level “Power Good”
6) Like 4) + additional derating from 55°C…70°C: 2%/°C
7) see datasheet 09 54 00 3002 6
Models in blue are not recommended for new designs.
Models in red are obsolete.