Exista
POWER SUPPLIES

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Autronic
Steuer- und Regeltechnik / Sachsenheim

DC-DC Converter AVP/KEP
Output power up to 200 Watts

Isolated – Single Output
Standard euro-rack size 19"

CE

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/m 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 diode
- Extremly low thermal stress of sensitive components due to dissipated power loss over lateral heatsink
- Yellow LED indicate operating mode
- Hold up time S2 according to EN 50155 (> 10 ms at $V_{in\ nom}$, $I_{out\ nom}$) only for 09 50 74 0103 7 Converter

Technology

- Power section in 160kHz-MOS-FET-technology
- Regulator section in SMT
- Coated assembly
- Coated and glued parts for better vibration resistance
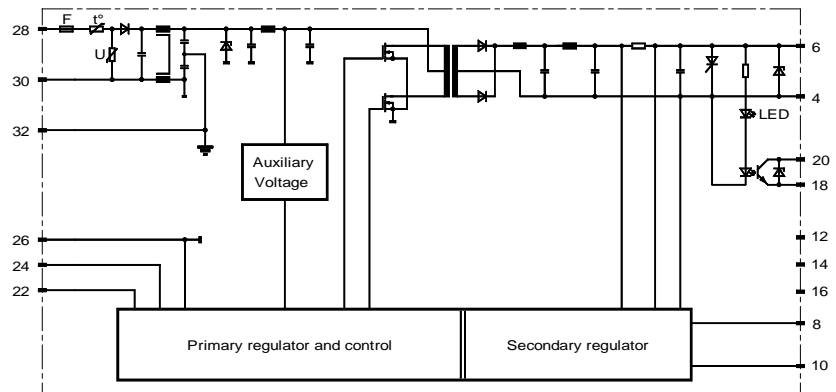
Specifications

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	$\Delta\vartheta_{Ci}$	≤ 20K
Rise on heat sink	$\Delta\vartheta_K$	≤ 35K

Output voltages (output 1)

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}	≤ 2mV
Load reg. static	ΔV_{out}	≤ 10mV/A
Load change (25°C)**	ΔV_{out}	≤ 38 (23)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}	≤ 6A

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}	≤ 4700 pF

Degrees of protection (inserted in rack)		= IP20***
Weight AVP/KEP	M	ca. 1070g

Block Diagram

4 = $-V_{out1}$
6 = $+V_{out1}$
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.

Auxiliary Voltage

Primary regulator and control

Secondary regulator

LED

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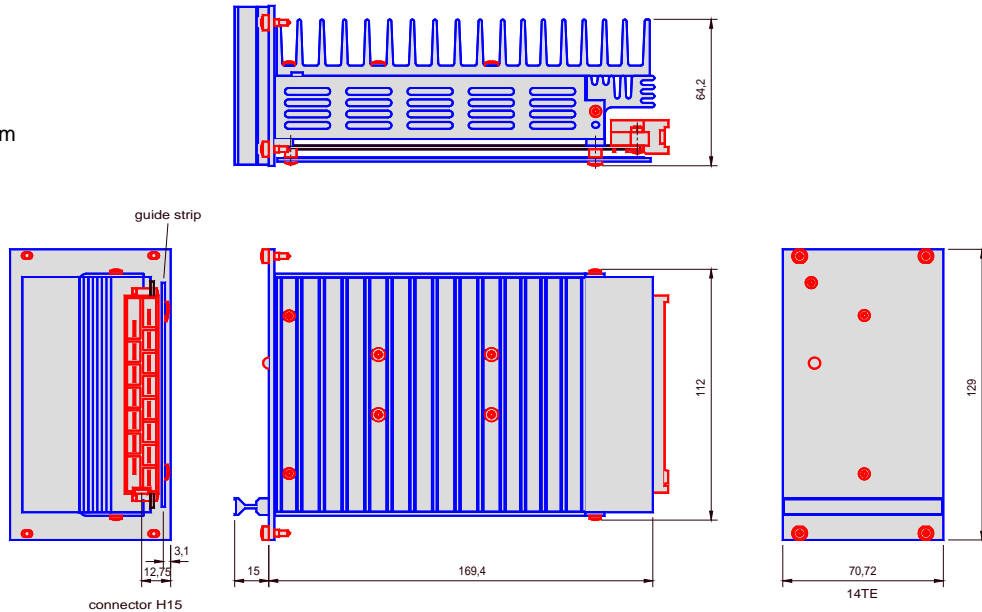** Higher degrees of protection by properly mounting
*** In built-in condition our devices may show different EMC properties

Drawing

Dimensions in mm
Tolerance: general ±1mm

Front panel DIN ISO 2768-1m

guide strip

64,2

112

129

3,1
12,75
connector H15

15

169,4

70,72

14TE

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.

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 ($\bigtriangledown$/$\oplus$) - 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 10 K.

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 and shut-down 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 ouput switches off and restarts automatically latest after 5s of elimination of the overload.

Capacitive load: When switching on (by connecting to the input voltage or by means of a control signal at the input "EN") the DC-DC converters can drive capacitive loads up to 100 mF parallel to the nominal load. At overload conditions the switching on period takes approx. 375 ms. After elimination of the overload the output voltage restarts automatically latest after 5 s.

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 go synchronously down and restart 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/KEP

V_{out} V	I_{out} A	η [2] %	Type	V_{PG} [3] VDC	$V_{in\,nom}$ VDC	$V_{in\,operating}$ VDC	$V_{in\,range}$ VDC	$I_{in\,max}$ A	Internal Fuse A	Order Number
12	12 [1]	85		>10	72	50…90	43…101	4	6,3	09 50 22 0102 6
15	10 [1]	85		>13	72	50…90	43…101	4,3	6,3	09 50 23 0102 5
15	10 [1]	87		>13	110	77…138	66…154 [4]	2,6	5	09 50 73 0102 4
24	6 [1]	84	AVP/KEP	>21	24	16…30	15…36	11,5	16	09 50 94 0102 8
24	6 [1]	83		>21	36	25…45	19…51	9,5	16	09 50 34 0102 2
24	7 [7]	87		>21	72	50…90	43…101	4,7	6,3	09 50 24 0102 4
24	9 [5] [6]	87		>21	110	77…138	66…154 [4]	3,5	5	09 50 74 0102 3
24	9 [5] [6]	87		>21	110	77…138	66…154 [4]	3,9	5	09 50 74 0103 7 [8]

Order numbers for option "EMC fingerstrips" and other options on request

1) Derating between 70°C and 85°C: 4%/°C
2) At $V_{in\,nom}$; typical
3) V_{Pg} = Switching point for the output level for "Power Good"
4) 176 V for 100 ms permissible
5) $I_{out\,lim}$ = 1,05…1,15 $I_{out\,nom}$
6) Derating between 60°C and 70°C: 0,1 A /°C; 70°C and 85°C: 0,32 A/°C
7) Derating between 60°C and 70°C: 0,1 A /°C; 70°C and 85°C: 0,25 A/°C
8) With hold up time S2 according to EN 50155 (> 10 ms at $V_{in\,nom}$, $I_{out\,nom}$)