AUTRONIC
A FORTEC GROUP MEMBER

DC-DC CONVERTER **HFC150-W, HFC150-2BW**

RAILWAY CONVERTER.

FOR CHASSIS MOUNTING

HIGHLIGHTS

+ **Output Power up to 150 Watts**
+ **Efficiency up to 92%**
+ **Ultra Wide Input Range**
+ **Wide Temperature Range**
+ **RoHS compliance**
+ **According to EN50155**

INPUT

Input Voltage Nominal	24, 36, 48, 72 and 110 VDC
Input Voltage Operating	16,8-137,5 VDC
Input Voltage Range	14,4-154 VDC (t ≤ 1,0 sec.)
No Load Input Current	See table page 2

OUTPUT

Output Voltage	± 15 V, ± 24 V, 24 V
Initial Set Accuracy	< 1 %*
Minimum Load	No minimum load
Short circuit	Continuous short circuit proof
Line Regulation	< 0,1 % typical
Load Regulation	< 1 % (0% - 100% load)
Ripple & Noise	< 1 % pk-pk, 20 MHz bandwidth*
Start Time	< 1,5 s
Max. Output Capacitance	500 uF x $I_{out\ nom}$
Temperature Coefficient	< 0.01 %/°C

FEATURES

Active Reverse Polarity Protection	Max.160 V
Active Inrush Current Limitation	< 3,0 A²S
Hold-up-time	>10 ms (only for V_{in} = 110 V)

PROTECTION

Over Voltage Protection (OVP)	110-130 % $V_{out\ nom}$. The output switches off and restarts after 500 ms time.
Over Current Protection (OCP)	$I_{out\ nom}$ > 105%. The output switches-off when $V_{out\ nom}$ < 80% and restarts automatically latest after 500 ms of elimination of the overload.
Over Temperature Protection (OTP)	Shutdown at +98 - 105°C case with approx. 5°C hysteresis and auto recovery.

GENERAL

Product Standard	EN 50155:2007
Isolation	4700 VDC Input to Output and Earth (87742401258) 3000 VDC Input to Output and Earth 2200 VDC Input to Earth (PE) 750 VDC Output to Earth (PE)
Switching Frequency	125 kHz
Dimensions [mm]	245 x 75 x 47
Weight	approx. 710 g
MTBF	683.830h acc. to MIL-HDBK-217F (GB, 45°C)****
Fire & Smoke	EN 45545-2:2016-02 HL3 (R25)

ENVIRONMENTAL

Operating Ambient Temp.	-40°C to +85°C** (Class TX)
Storage Temperature	-40°C to +85°C
Altitude	up to 2000m
Vibration / Shock / Bump	EN 61373:1999, Cat. 1B

EMC & SAFETY

EMC Standard	EN 50121-3-2:2016
Emissions	EN 50121-3-2:2016
ESD Immunity	EN 61000-4-2:2009 level 3 (6kV/8kV), Criteria B
Burst	EN 61000-4-4:2012, level 3 (2kV), Criteria A
Surge	EN 50121-3-2:2016, line to line ±1kV, 42R, and line to case ±2kV, 42R, Criteria A
Conducted Immunity	EN 61000-4-6:2014, level 3 (10V), Criteria A
Radiated Immunity	EN 61000-4-3:2006+A1:2008+A2:2010, 20V/m, Criteria A
Safety	Designed to meet EN 61204-7:2006

* For T_{amb} = 25°C, $V_{in\ nom}$, $I_{out\ nom}$
**+70°C continuously, +85°C max. 10 minutes at full load
*** In built-in condition our devices may show different EMC properties
**** Calculated with order number 87 74 87 0125 3

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Specifications subject to change without notic 80 74 00 3001 9 a01 · 12·2019

TECHNICAL DATA

For T_{amb}=25°C,$V_{in\ nom}$,$I_{out\ nom}$, unless otherwise specified

SPECIFICATION Input 14,4 - 154 VDC

	TYPE		HFC150-2BW/G				
	ORDER NUMBER		87 74 87 0125 3				
	CHARACTERISTIC	Unit					
INPUT	Input Voltage Nominal	V	24	36	48	72	110
	Input Voltage Operating	V	16,8...36	21,6...51	28,8...67,2	43,2...101	66...138
	Input Voltage Range	V	14,4...154 (t ≤ 1,0 sec.)				
	Under Voltage Turn-on	V	<16,8				
	Under Voltage Turn-off	V	<14,4				
	Input Current @ Full Load	A	7,0	4,7	3,5	2,3	1,5
	Input Current @ No Load	A	0,05	0,04	0,03	0,02	0,02
	Recommended External Fuse	A	12				
OUTPUT			Output 1		Output 2		
	Output Voltage Nominal	V	15		-15		
	Output Current	A	5		-5		
	Output Power	W	75		75		
	Efficiency @ Full Load (typical)	%	89	90	90	90	90
	Output Current limit	A	5,25...6,50		-5,25...-6,50		
	Short Circuit Current (typical)	A	14 (pulse approx.2,0Hz)*		14 (pulse approx.2,0Hz)*		
	Transient Response 25 % / 75 % Load Step Recovery Time < 1 ms	mV	±150		±150		

SPECIFICATION Input 14,4 - 154 VDC

	TYPE		HFC150-2BW/G				
	ORDER NUMBER		87 74 98 0125 9				
	CHARACTERISTIC	Unit					
INPUT	Input Voltage Nominal	V	24	36	48	72	110
	Input Voltage Operating	V	16,8...36	21,6...51	28,8...67,2	43,2...101	66...138
	Input Voltage Range		14,4...154 (t ≤ 1,0 sec.)				
	Under Voltage Turn-on	V	<16,8				
	Under Voltage Turn-off	V	<14,4				
	Input Current @ Full Load	A	6,8	4,5	3,4	2,2	1,5
	Input Current @ No Load	A	0,05	0,04	0,03	0,02	0,02
	Recommended External Fuse	A	12				
OUTPUT			Output 1		Output 2		
	Output Voltage Nominal	V	24		-24		
	Output Current	A	3,1		-3,1		
	Output Power	W	75		75		
	Efficiency @ Full Load (typical)	%	90	91	92	92	91
	Output Current limit	A	3,25...4,0		-3,25...-4,0		
	Short Circuit Current (typical)	A	13 (pulse approx.2,0Hz)*		13 (pulse approx.2,0Hz)*		
	Transient Response 25 % / 75 % Load Step Recovery Time < 1 ms	mV	±150		±150		

SPECIFICATION Input 14,4 - 154 VDC

	TYPE		HFC150-W/G				
	ORDER NUMBER		87 74 24 0125 9				
	CHARACTERISTIC	Unit					
INPUT	Input Voltage Nominal	V	24	36	48	72	110
	Input Voltage Operating	V	16,8...36	21,6...51	28,8...67,2	43,2...101	66...138
	Input Voltage Range		14,4...154 (t ≤ 1,0 sec.)				
	Under Voltage Turn-on	V	<16,8				
	Under Voltage Turn-off	V	<14,4				
	Input Current @ Full Load	A	6,8	4,5	3,4	2,2	1,5
	Input Current @ No Load	A	0,05	0,03	0,03	0,02	0,02
	Recommended External Fuse	A	12				
OUTPUT	Output Voltage Nominal	V	24				
	Output Current Nominal	A	6,25				
	Output Power	W	150				
	Efficiency @ Full Load (typical)	%	90	91	92	91	91
	Output Current limit	A	6,6...8,0				
	Short Circuit Current (typical)	A	23 (pulse approx. 2,0Hz)*				
	Transient Response 25 % / 75 % Load Step Recovery Time < 1 ms	mV	±200				

* Peak current pulsating

TECHNICAL DATA

For T_{amb}=25°C,$V_{in\ nom}$,$I_{out\ nom}$, unless otherwise specified

SPECIFICATION Input 14,4 - 154 VDC

	TYPE		HFC150-W/G				
	ORDER NUMBER		87 74 48 0125 1				
	CHARACTERISTIC	Unit					
INPUT	Input Voltage Nominal	V	24	36	48	72	110
	Input Voltage Operating	V	16,8...36	21,6...51	28,8...67,2	43,2...101	66...138
	Input Voltage Range		14,4...154 (t ≤ 1,0 sec.)				
	Under Voltage Turn-on	V	<16,8				
	Under Voltage Turn-off	V	<14,4				
	Input Current @ Full Load	A	6,8	4,5	3,4	2,2	1,5
	Input Current @ No Load	A	0,05	0,04	0,03	0,02	0,02
	Recommended External Fuse	A	12				
OUTPUT	Output Voltage Nominal	V	48				
	Output Current Nominal	A	3,1				
	Output Power	W	150				
	Efficiency @ Full Load (typical)	%	90	91	92	92	91
	Output Current limit	A	3,25...4,0				
	Short Circuit Current (typical)	A	13 (pulse approx. 2,0Hz)*				
	Transient Response 25 % / 75 % Load Step Recovery Time < 1 ms	mV	±200				

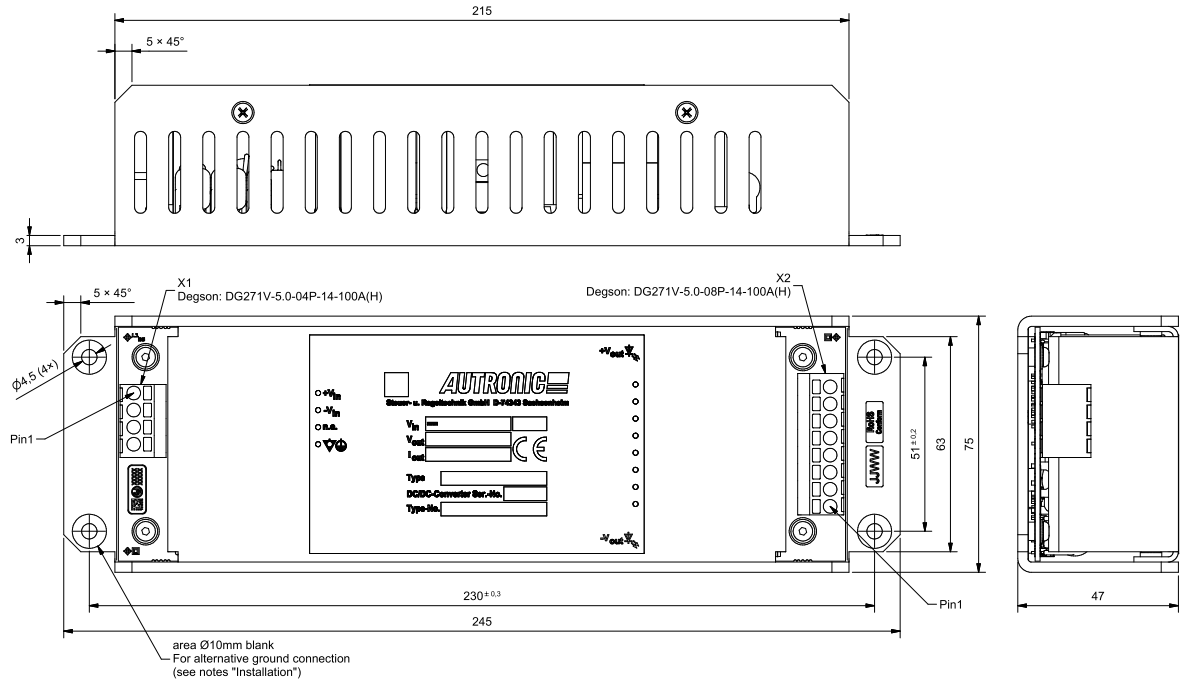
TECHNICAL DATA

For T_{amb}=25°C,$V_{in\ nom}$,$I_{out\ nom}$, unless otherwise specified

MECHANICAL DETAILS

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

Coating: Lackwerke Peters ELPEGUARD SL 1307-FLZ/2
Protection Degree: IP20



Production acc. to IPC-A-610 (exception bonding)

PINNING

Pin	Function	Pin	Function
X1-1	$+V_{in}$	X2-1	GND (87742401259)
X1-2	$-V_{in}$	X2-2	GND (87742401259)
X1-3	n.c.	X2-3	$+V_{out1}$
X1-4	PE	X2-4	$+V_{out1}$
		X2-5	GND (only for 2BW)
		X2-6	GND (only for 2BW)
		X2-7	$-V_{out2}$ (only for 2BW) or GND (87744801251
		X2-8	$-V_{out2}$ (only for 2BW) or GND (87744801251

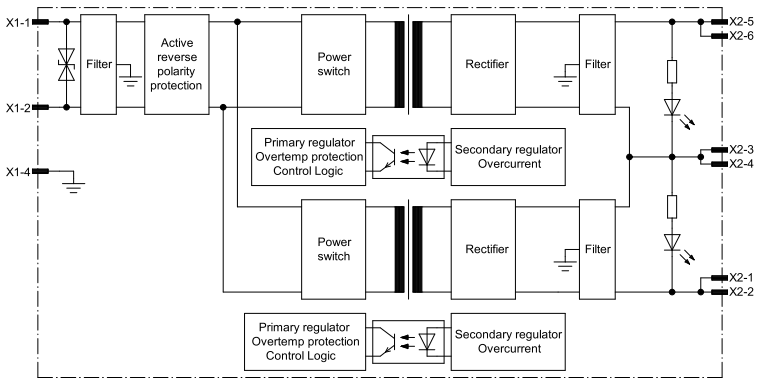
NOTES

Installation instructions:
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, carry off heat, fastening and protection against accidental contact. Plug in not under voltage if converter connected parallel or in series. The connection to earth/chassis ground has to be done by the pin X1-4 or the 4 mounting holes. The mounting surface must be flat and able to remove the thermal energy of the Converter.

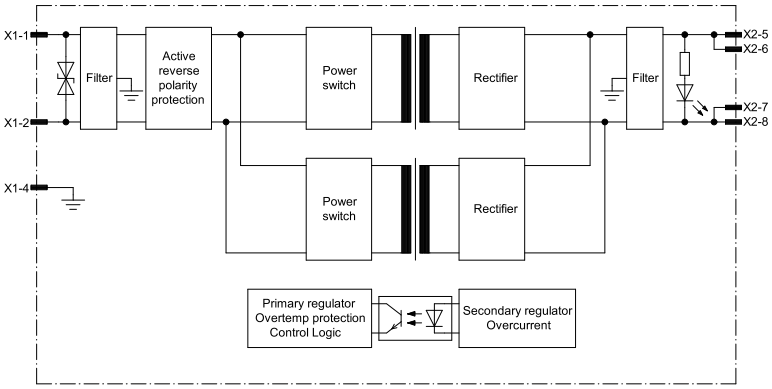
Fault protection:
For input protection a time-lag fuse corresponding to IEC 60127-2 must be installed. In case of fault the supplying current source must be capable to blow the fuse.

BLOCK DIAGRAM

HFC150-W / 87 74 24 0125 9:



HFC150-2BW:



HFC150-W / 87 74 48 0125 1: