

# DC/DC Emergency Starter Converter

300W | 650W

600 NSB 1500 M110 W00

$V_{In\ Nom} = 1500\ V_{DC}$

$V_{Out\ Nom} = 110\ V$   $I_{Out} = 2.75\ A$  | 6A\_3sec

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>INPUT</b>						
$V_{In}$	Input voltage range	Continuous operation Dyn. operation @ EN 50163 $U_{Max2}$	1'000 1'800		1'800 1'950	$V_{DC}$ $V_{DC}$
	Input voltage range (short time range)	$V_{In}$ for $t \leq 20\ ms$ @ EN 50163 $U_{Max3}$ Converter switching OFF	2'050		2'538	$V_{DC}$
	Surge	$V_{In}$ for $t \leq 1\ ms$	12			kV
$V_{In\ min}$	Switch ON input voltage		950		1'000	$V_{DC}$
$V_{In\ min}$	Switch OFF minimum input voltage		900		975	$V_{DC}$
$V_{In\ max}$	Switch OFF maximum input voltage		2'000	2'050	2'100	$V_{DC}$
$I_{In\ max}$	Input current maximum at $V_{In\ min}$	$V_{In}, T_A, I_{Out} = 2.75\ A$ // 6A		0.1	1.0	A
Fuse	Input fuse on PCB	1 fuse 4A 4kV Dim.:10mm x 85mm				
	Input reversal protection			None		

## OUTPUT

$1000\ V_{DC} \leq V_{In} \leq 1800\ V_{DC}$

$P_{Out\ Nom}$	Output ON time limit $t \leq 6$ minutes	Converter On time $t \leq 6$ min. after push button activated		300		W
$P_{Out\ peak}$	Max. 3sec time interval $P_{Peak}$   $P_{Peak} \geq 6min$	Within 6 minute 1x for $t \leq 3$ sec $I_{Out} = 6A$ available		660 6		W A
$V_{Out\ Nom}$	Factory adjust output voltage	$V_{In} = 1500V$ and $I_{Out} = 2.75\ A$	105	110	115	$V_{DC}$
$\Delta V_{Out}$	Regulation accuracy	$0\ A \leq I_{Out} \leq 2.75\ A$ $T_A = -40^\circ C$ to $+70^\circ C$ Temp. class T3	< 20 % $V_{Out\ Nom}$			$V_{DC}$
$V_{Out\ rms}$	Ripple voltage	No load to nominal load BW 300 kHz		0.5	2.0	$V_{rms}$
$V_{Out\ pp}$	Spikes	No load to nominal load BW 20 MHz			2.5	$V_{pp}$
$t_{On}$	Switch On time for output voltage rise up Converter starts only when Push Button is closed. $V_{in}$ must be inside specified range	$0\ A \leq I_{Out} \leq 2.75\ A$		3	5	sec
$I_{Out}$	Output current	continuous	2.75	2.8		A
	Current limit function: two point regulation	Switch ON/OFF interval on request Continuous // peak	3.9 6.5			A A
$I_{Outsc}$	Short circuit current two point regulation	Output short circuited ( $R < 1\ \Omega$ ) between $+V_{Out}$ and $-V_{Out}$			3.2	A
$C_{Out}$	Max. allowed external capacitance load				470	$\mu F$
Loads	External active loads must be specified	e.g. starting DC/DC converter load				
K1	Starting $V_{Out}$	Push Button must be closed to switch ON the output voltage	pins closed betw. pins 11 / 12			

## COMMON DATA

f	Switching frequency			15		kHz
$\eta$	Efficiency	$V_{In} = 1500\ V_{DC}, P_{Out} = 300\ W$	70	78		%
	Usage time		20			years
	MTBF @ SN 29500 $T_A = +40^\circ C$	$V_{In} = 1500\ V_{DC}, P_{Out} = 300\ W$		400'000		h
	No load-, short circuit protection	2 step regulation	continuously			

## SAFETY / DIMENSIONS

	Switch OFF transformer overtemperature		105°C - 5 K, +10 K			
	Transformer Partial discharge tested Type test only, piece test on request PCB FR4, V0, TG = +140°C		2'650 V, 10 pC			
	Creepage / Clearance @ PD2, OV3 acc. EN 50124 - 1 0V 3	Input   Output Input   Case (Gnd) Output   Case (Gnd)	36 / 36 18 / 18 2 / 2			mm mm mm
	Isolation test voltage Piece test ramp function: 5s – 10s – 5s	Input   Output Input   Case (Gnd) Output   Case (Gnd)			5.2 3.0 0.5	kV <sub>AC</sub> kV <sub>AC</sub> kV <sub>DC</sub>
	Connecting Green/Yellow	Input: + $V_{In}$ and - $V_{In}$ Output: + $V_{Out}$ and - $V_{Out}$ Protection earth (class 1)	Ettinger 13.44.656 Pin strip 721 - 442/001-000 Mounting plate connected with chassis			WAGO
	Protection class, protection degree		I, IP 00			
	Dimensions incl. Mounting plate	B x H x T	430 x 300 x 75			mm
	Mounting, consider mounting direction	Wall mounting with screws	6 x M6			
	Weight			6.3		kg
	Temperature reference meas. point for $T_A$	10 cm below converter	10			cm

# DC/DC Emergency Starter Converter NSB

300W | 650W

600 NSB 1500 M110 W02

SYMBOL    PARAMETER    TEST CONDITIONS    MIN    TYP    MAX    UNIT

### AMBIENT CONDITIONS

$T_A$	Operating temperature range	EN 50155 class T3	- 40		+ 70	°C
$T_{Sto}$	Storage temperature range		- 40		+ 85	°C
	Cooling		free air convection			
	Humidity	EN 50155, IEC 60571	75% averaged per year, 95% 30 days			
	Vibration / Shock	IEC 61373, IEC 68-2-27, BN 411002 cat. I 3 shocks each axis	50 m / s <sup>2</sup> , 30 ms			
	Max. operating / storage altitude		< 1200 m above NN / 40°C < 1800 m above NN / 30°C			

### EMC

	Emission	Line and radiated (converter inside Ext. closed housing)	EN 50121 - 3 - 2: 2006
	Voltage transient withstand	acc. UIC 550	12 kV t ≤ 1 ms

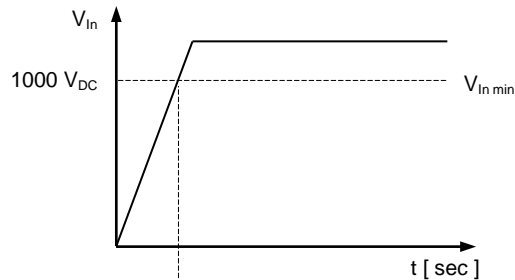
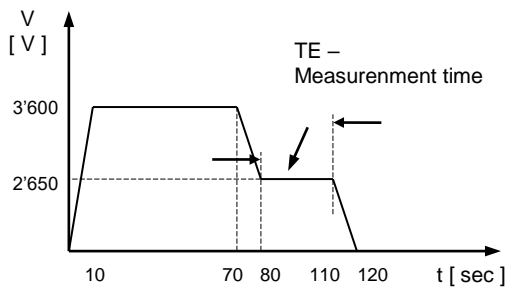
### STANDARDS / NORMS

Referenced Standards:	EN 50155: 2007	EN 50163: 1996	EN 50124 - 1: 2006	EN 50121 - 3 - 2: 2006	EN 60529
	EN 50207: 2000	EN 50 121 - 1	EN 50125 - 1	EN 60068 - 2 - 6, 2...27	EN 61000 - 4 - 2...6
	UIC 550 04/2005	IEC 61373: 1999	EN 60721 - 3 - 5	EN 61373: 1999	VDE 115 / T. 106
	UIC 626				

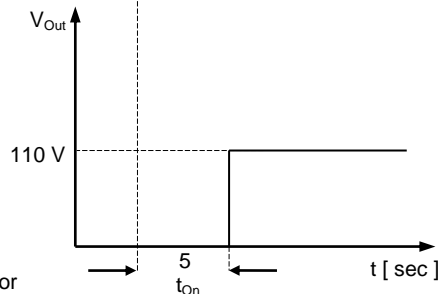
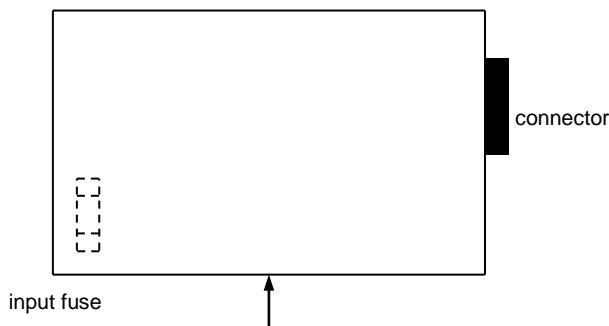
Technical Data referenced at: - 40° C ≤  $T_A$  ≤ + 70° C, 1000 V<sub>DC</sub> ≤  $V_{In}$  ≤ 1800 V<sub>DC</sub> if not otherwise stated.

Transformer partial discharge test  
EN 50207: 2000

Switch ON time  $t_{ON}$



Mounting direction – vertical!



necessary distance to bottom  
for free air convection > 10 cm, this is also  
ref. temperature measurement point