

<b>HANSMANN Electronic GmbH &amp; Co. KG</b>	<b>December 2010</b>		<b>Technical Information</b>
<b>Specification</b>	<b>HBX180</b>		<b>Edition: 2.44</b>
Ballast for 150 to 180W-short arc discharge lamps	Datasheets:	10 Pages	<b>Status:</b> <i>Valid</i>

Please read this information carefully, before installing and operating the power supply!



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<b>Electronic Ballast “HBX 180” and “HBX 180-V” requires use of ignitor ZG 20Xe-(A/S)</b>		
<b>Order Code:</b>	<b>HBX 180</b>	Standard Version
	HBX 180-V	Version with additional plug for rectified 380V output for connection with low voltage power supply QD-3023
	ZG 20Xe-A	Ignitor with asymmetric ignition
	ZG 20Xe-S	Ignitor with symmetric ignition
	QD-3023	Optional low voltage power supply for connection to 380V-output
<b>OSRAM-Lamps:</b>	<b>Features:</b>	
XBO 150 W/1	<ul style="list-style-type: none"> <li>• Power supply for xenon filled short arc lamps</li> <li>• Designed for Xenon short arc lamps rated <b>from 150 to 180W</b></li> <li>• Output power customer selectable by DIL/16step –switch</li> <li>• Capable to drive lamp voltages ranging from <b>10 to 29V</b></li> <li>• Certified by <b>OSRAM</b> and <b>USHIO</b></li> <li>• Input voltage range from <b>90V AC to 264V AC</b>, power factor corrected line input, built-in EMI-filter: meets CE and FCC part “A”</li> <li>• <math>\mu</math>P controlled, digital power management with high output stability over lamp Lifetime</li> <li>• Certified according to IEC (UL) 60601</li> </ul>	
XBO 150 W/CR OFR		
XBO 150 W/S		
XBO R 180 W/OFR		
cascaded operation	<ul style="list-style-type: none"> <li>• Output short circuit protected and “Arc to Ground” protected</li> <li>• Galvanic separation of lamp output and line input, thermal shut off at 90°C</li> <li>• Shut off function for end of life and lamp fail parameter</li> <li>• Ballast cascadable with HBX300 for use for higher wattage Xenon lamps</li> <li>• Auxiliary regulated 24V/ 0.2A output for fan drive (available only when lamp lit)</li> <li>• Flexible Design: new lamps and functions adaptable by software</li> <li>• Other lamps on request</li> </ul>	
With HBX300 possible		
<b>Ushio Lamps:</b>		
150W Xe		
180W Xe		

**Revisions of:**

**Specification of HBX 180 (V)**

<b>Date</b>	<b>Revision</b>	<b>Description</b>
<b>March 2004</b>	<b>1.0</b>	<b>First Release</b>
<b>May 2006</b>	<b>1.5</b>	<b>Second release after re-design</b>
		(changed internal control, power curves added)
<b>Feb 2007</b>	<b>2.0</b>	<b>New format + features</b>
		(PWM-dimming, connection to QD-3023)
<b>Apr 2007</b>	<b>2.1</b>	<b>Omitting DC-Input</b>
<b>Sep 2007</b>	<b>2.2</b>	<b>Updated Power Curve</b>
<b>April 2010</b>	<b>2.4</b>	<b>Updated Power curve with additional fixed current curve</b>
<b>Oct 2010</b>	<b>2.42</b>	<b>Additional power curve listed, operation hour counter added</b>
<b>Dec 10</b>	<b>2.44</b>	<b>Updated mechanical drawing and corrected option board circuit</b>

## Electrical Data

All values are valid at  $25 \pm 5^\circ\text{C}$ , unless otherwise noted

### Input Data

Nominal Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Input voltage AC Line	U	V AC	100-240	90 - 264	
Input voltage DC-Line	U	V DC	DC-Input not allowed as not compatible with fuse		
System wattage	$P_{LI}$	W		150 -350	depends on select
Input current	$I_{LI}$	A		0.6 – 1.4	depends on select
Line frequency	Fin	Hz	50/60	47 – 63	
Line Power factor	PFC	1	1.0	0.92 to 1.0	
Leakage Current to PE	$I_{Leak\_SA}$ $I_{Leak\_QD}$	$\mu\text{A}$	<150 <300		Standalone Combined w. QD-3023

Other Operation Data	Symbol	Unit	Nominal	Tolerances	Remarks
System wattage during ignition	$P_{ign}$	W	25	<30	
System wattage standby-operation	$P_{LIStby}$	W	1	0.5 – 2.0	

### Lamp Output Data

Ignition	Symbol	Unit	Nominal	Tolerances	Remarks
Ignition voltage with ZG 20Xe	$U_{ign}$	$\text{kV}_{peak}$	$\pm 14$	$\pm 12 - \pm 16$	Load capacity <20pF
Ignition time	$t_{ign\ on}$	sec.	1	0.9 – 1.1	
automatic restart counter			5	--	Attempts

Run-up Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Run-up Current @ 15V	$I_{max}$	A	10, 14	+/-10%	Inside specified lamp-parameter (select by S1)
Lampvoltage	$I_{max}$	A			
In rush Current	$I_{max}$	A	30		0 to 1ms

Nominal Operation	Symbol	Unit	Nominal	Tolerance s	Remarks
Lamp voltage	$U_{La}$	V	10 - 29	+/-5%	Depends on lamp select
Lamp wattage	$P_{La}$	W	150, 180	+/-2%	Selectable by Mode Sw.
Lamp current	$I_{La}$	A			Depend on select
End-Of Life-Cut off voltage	$U_{La,max}$	V	30	+/-2V	
End-Of-Life-Cut off time	$t_{EOL-Off}$	s	< 0.2		
RF-Ripple of output power	$\Delta P_{La,rip} / P_{La}$	%	< 1 p-p		13V-30V
50Hz –60Hz Ripple		%	< 1 p-p	< 4 p-p	13V 30V
Shift in output power with shift in input voltage	$\Delta P_{La} / \Delta U_{LI}$	1		< 0.005	within nominal values
Open circuit voltage	$U_{ocv}$	V	110	105 –115	

## LIFETIME DATA

All values for  $U_u = 230 V_{mrs}$   
Temperature at test point =  $70^\circ\text{C}$

	Symbol	Unit	Nominal	Tolerances	Remarks
ballast lifetime	$t_{life}$	H	25.000	> 25.000	acc. To MIL HDBK for nominal operation

## MISCELLANEOUS DATA

Nominal Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Power losses at 115V at 230V	$P_V$	W	20 – 45 15 - 40	+/-	Depends on power select
Efficiency	$\eta$	1	0.83	0.8 – 0.9	Depend on Lamp current
Ambient temperature	$T_A$	°C	+ 25	-10 - +50	non condensing
Maximum temperature at test point	$T_c$	°C	+ 80		Case surface near output at U-profile
Internal temp. switch off temperature	$T_{c-off}$	°C	+90	+85 - +95	At heatsink no de-rating till switch off

Standby Mode	Symbol	Unit	Nominal	Remarks
Minimum mains shut-off time for restart	$T_{reset}$	s	3	Standby mode is present when the lamp doesn't light 1. when ignition hasn't been successful 2. when lamp output is shorted 3. when lamp extinguishes while running

Geometry and Weight	Symbol	Unit	Nominal	Tolerances	Remarks
Length	$l$	mm	180	+/-1	See dwg.
Width	$w$	mm	102	+/-1	See dwg.
Height	$h$	mm	43	+/-1	see dwg.
Housing					open case Al-profile
Weight	$W_B$	Kg	0.7	+/-0.05	

Wiring length	Symbol	Unit	Nominal	Tolerances	Remarks
Between ignitor and lamp	$L_{il}$	mm	250	Max	Short as possible
Between ballast and ignitor	$L_{bl}$	mm	500	Max	External IgnitorZG 20Xe

Cooling method	Symbol	Unit	Nominal	Remarks
airflow		meter per second	Built in fan	Must be checked in actual application

Plugs and Cables	Manufacturer / Type	Remarks / Header/Contacts
Ballast mains plug	CN 1 AMP/MTA-156-3- 643495-2 Wiring with AWG 18, 105°C, 900V, (recommended)	See drawing on page 6
Ballast interface plug	ST 2 JST / B2B-EH-A Non isolated to line voltage CAUTION	See drawing on page 6
Auxiliary 380V plug HBX 300-V only	ST 6 JST B2P3-VH-B	See drawing on page 6
Fan connection plug	ST 3 / ST 4, JST / B2B-EH-A for internal 24V Fan, ST4 for aux use 100mA, Non isolated to line voltage	See drawing on page 6
Connection Ballast-Ignitor	J1 =+, J2=- Faston 6.3mm x 0.8mm	
Option plug	ST101 Molex 53261-490 or 53261-0471 Functions: See drawing on page 6	See drawing on page 6
Ignitor HV-plug to lamp Lamp cable	By screw M3	

### PIN Assignment and Fuse

Connector	Signal	Status	Description
Line input CN 1	PIN 3 PIN 2 PIN 1	AC in -L- AC in -N- PE	AC - wide range input Voltage 90V – 264V  Safety Ground
ST 3 and ST 4 Fan drive JST B2B –EHA	PIN 1 + PIN 2 -	Fan +24V Fan – (0V) 200mA max. (both outputs)	Caution: Fan drive output voltage is only available, when lamp lit.
Lamp output Terminal J1, J2	J 1 + J 2 -	Plus Lamp Voltage Minus and Power	Connection to external Ignitor ZG 20Xe
Option Board terminal ST101 opto-isolated	Pin 1 Pin 2 Pin 3 Pin 4	Dim (PWM with 100Hz) On-Off Lamp Lit feedback Secondary GND	Dim-Input to ballast (100% duty cycle=min P) Function depends on lamp select Conductive to Pin 4 = lamp lit Common GND relative to Pin 1,2 and 3 Further information, refer to drawing
Fuse		Fixed built -in T 5A/ 250V	CAUTION! For Continued Protection Against Risk of Fire, Replace Only with Same Type and Rating of Fuse

Standards	
Safety and performance Certifications	UL 60610-1, IEC 60610-1(CB) CB- Test, and UL must be completed with the final product
RFI – (Radio Frequency Interferences) (Funkentstörung)	has to be done with complete assembled project, built-in EMI-filter, that meets CE and FCC (A) requirements, for “B” an additional Filter is recommended (has to be tested with final product)

Environmental Requirements	Ambient conditions	Remarks
Storage Temperature Range	-20°C - +50°C	
Operating Temperature Range	0°C – 60°C	Depend on cooling
Humidity Range	20% - 95% non condensing	
Altitude operating	0 Ft. to 10000 Ft.	
Altitude not operating	0 Ft. to 40000 Ft.	
Vibration operating	G <sub>rms</sub> , 5 Hz to 500 Hz random 10min x y z axis	t.b.d. not tested
Vibration not operating	G <sub>rms</sub> , 5 Hz to 500 Hz random 10min x y z axis	t.b.d. not tested
Shock operating	G <sub>rms</sub> , ½ sine wave, 11ms x y z axis	t.b.d. not tested
Shock not operating	G <sub>rms</sub> , ½ sine wave, 11ms x y z axis	t.b.d. not tested

Specifications subject to change without notice

Power Adjustment by Switch S1 Mode sw

S1	Power	Function	
0	150W	on without signal	Current limited to 7.5A
1	180W	on without signal	Current limited to 13A
2	180W	on without signal	Current limited to 13A, same as 1
3	150W	on without signal	Current limited to 9A
4			
5			
6			
7			
8			
9			
A			
B	150W	off without signal	Current limited to 7.5A
C	180W	off without signal	Current limited to 13A
D	180W	off without signal	Current limited to 13A, same as C
E	150W	off without signal	Current limited to 9A
F			

USHIO Lamp Series USH----,UXM---,UXL---,UXR---, with corresponding power-  
OSRAM Lamp Series XBO---- and HBO--- with corresponding power-  
- and **rated** voltages below 24V

The above described function “on or off without signal” is available at ST2. Without signal means open or +5V. The signal function is active, when both pins are shorted by contacts (relay, push button contacts or equivalent) or opto-coupler-transistor.

CAUTION: these pins are connected to line input voltage.

The ballast is equipped with an internal counter that counts the number of operation hours as well as ignition attempts. This feature can only be used by the factory or an appointed service representative.

The remaining switch positions are open for customized functions or different lamp specification.

## Optional DC-DC-converter QD-3023 in combination with HBX 180-V

DC Output Characteristics				
	V1	V2	V3	V4 (Prim. Side)
Output Voltage	+3.3V	+5.2V	+12.35V	+Vcc
Max. Load	1.5A	1.5A	1.0A	100mA
Nom. 1 Load	0.4A	0.6A	0.8A	80mA
Nom. 2 Load	0.4A	1.5A	0.5A	50mA
Nom. 3 Load	1.3A	1.3A	0.5A	20mA
Nom. 4 Load	1.0A	0.3A	0A	0mA
Nom. 5 Load	0A	0.3A	1.0A	0mA
Minimal Load	0A	0A	0A	0mA
Overall Reg. %	+/-5%	+/-5%	11.4-13.8V	14.5V +/- 1.5V
Ripple & Noise	50mV	50mV	100mV	100mV

**Note:** The maximum allowed ripple/noise output of the power supply is measured over a bandwidth of 0Hz to 20MHz at the power supply output terminals. A 10 $\mu$ F electrolytic capacitor in parallel to a 0.1 $\mu$ F ceramic capacitor are placed at the point of measurement. The DCDC-converter is powered on using minimal load and is then switched to nominal or maximum load.

Output Rise times	Symbol	Unit	Nominal	Tolerances	Remarks
10 to 90% upon power up	$t_{10-90}$	ms	20	Max	
All voltages within Spec.	$t_{up}$	s	3	Max	.

Geometry and Weight	Symbol	Unit	Nominal	Tolerances	Remarks
Length	l	mm	67	+/-0.5	See dwg.
Width	w	mm	41	+/-0.5	See dwg.
Height	h	mm	17	+/-0.5	see dwg.
Housing					PCB
Weight	$W_B$	g	37	+/-1	

### PIN Assignment and Fuse

Connector		Signal	Status	Description
DC input connector J1	PIN 1	+400V		Input Voltage 100 to 400V for minimal load, nominal 4 and nominal 5 load Input volt. 300 to 400V for nominal/max load V4=Vcc
	PIN 2	n/c		
	PIN 3	Pri. GND		
	PIN 4	+14.5V		
DC output connector J4	PIN 1	+3.3V (V1)		Isolated Output on secondary side
	PIN 2	+3.3V (V1)		
	PIN 3	Secondary GND		
	PIN 4	+5.2V (V2)		
	PIN 5	Secondary GND		
	PIN 6	+12.35V (V3)		
	PIN 7	Secondary GND		

Standards	
Safety and performance Certifications	UL(CUL) 1950, EN60950 (TUV), CB-report available CB- Test, and UL must be completed with the final product
RFI – (Radio Frequency Interferences) (Funkentstörung)	has to be done with complete assembled project, built-in EMI-filter, that meets CE and FCC (A) requirements, for “B” an additional Filter is recommended (has to be tested with final product)

## *Additional hints for use and safety:*

### **1. Safety**

Because of instant hot restrike, the output voltage to the lamp can reach values of up to +/-15000 Volts! Please ensure minimum 15mm clearance between all lamp terminals to PE, to prevent arc to ground situation!! Primary wiring has to meet national requirements for electric safety!

### **2. Lamp power selection:**

By multimode 16-step switch (0-F). (see table above)

### **3. Fan drive output**

The unit has two 24V output terminals for driving one or two fans. One is intended for the power-supply and one for the lamp. The maximum output current for both outputs is total 200mA.

The 24V output voltage is only available, when the lamp is in operation.

CAUTION! This terminal is connected to line voltage!

### **4. Cooling**

This unit is assembled with an internal fan, which ensures proper operation at ambient temperatures up to 50°C. Nevertheless it is necessary to keep air in-and –outlet free.

In all cases, the temperature at the temperature test point should be tested to ensure most reliable operation. This temperature should not exceed 80°C.

Temperature overload is protected by an internal temperature switch at 90°C at the internal heatsink.

### **5. Fuse and Safety**

**CAUTION!** For Continued Protection Against Risk of Fire, Replace Only with same Type and Rating of Fuse! The fuse is a fixed built- in component with T5A / 250V rating.

If the fuse has failed, the power-supply must be returned to the factory for repair.

### **6. Increasing reliability and functions**

Custom modifications of power curves and adaptation to other lamp types are possible upon request.

### **7. Please see the following pages for additional information about wiring, mounting and operating data.**



# HBX180

Electronic Powersupply for low voltage high current  
 metal halide discharge lamps up to 180W (10V - 30V)  
 HANSMANN electronic GmbH & Co.KG May 2006

Output to Ignitor / Lamp

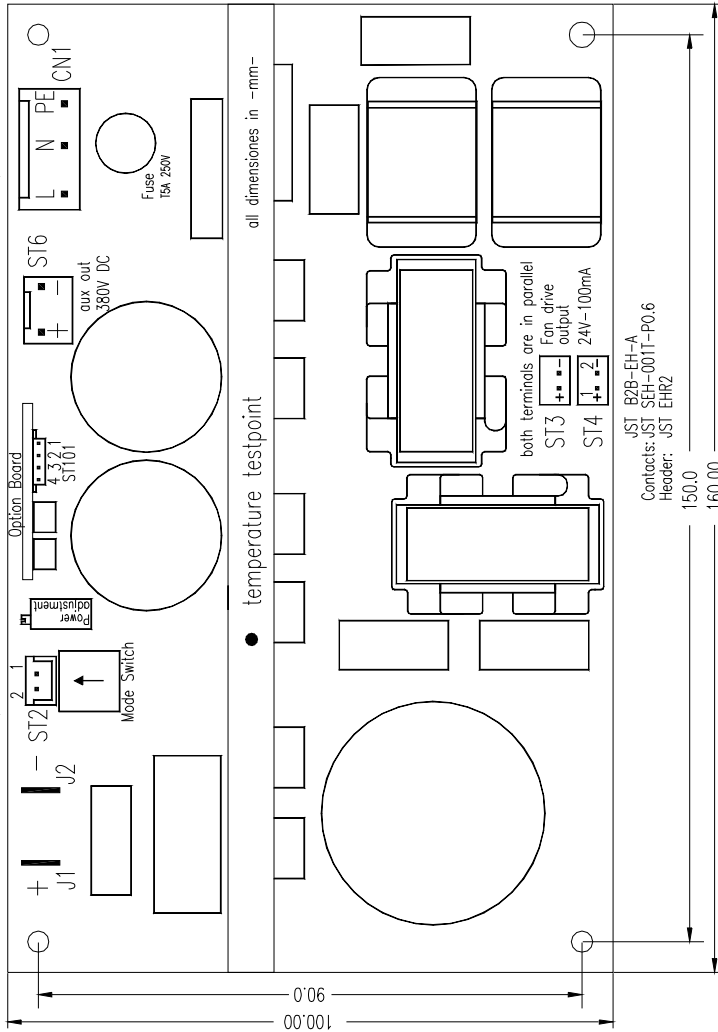
fashion 6.3 x 0.8mm

Line Input  
 100V to 250V  
 47Hz - 63Hz  
 PFC wide-range  
 AMP/ 770522-1  
 AMP/ 770849-5  
 AMP/ 643495-2

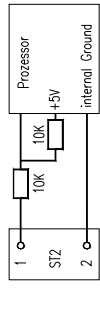
Molex 50079-8000  
 Molex 51021-0400  
 Molex 53261-490

Contacts: JST SEH-001T-P0.6  
 Header: JST EHR2  
 JST/ B2B-EH-A

JST BVH-21T-P1.1  
 JST VHR-3N  
 JST B2P3-VH-B

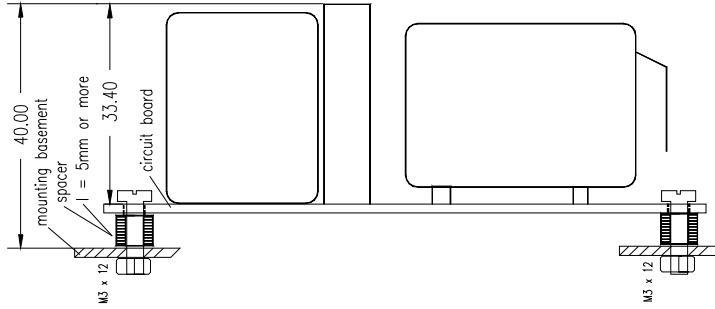
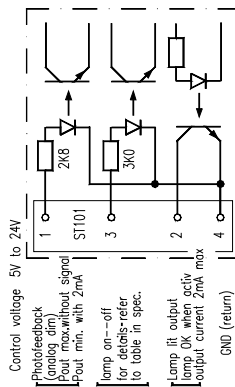


### Use of non isolated control terminal ST2

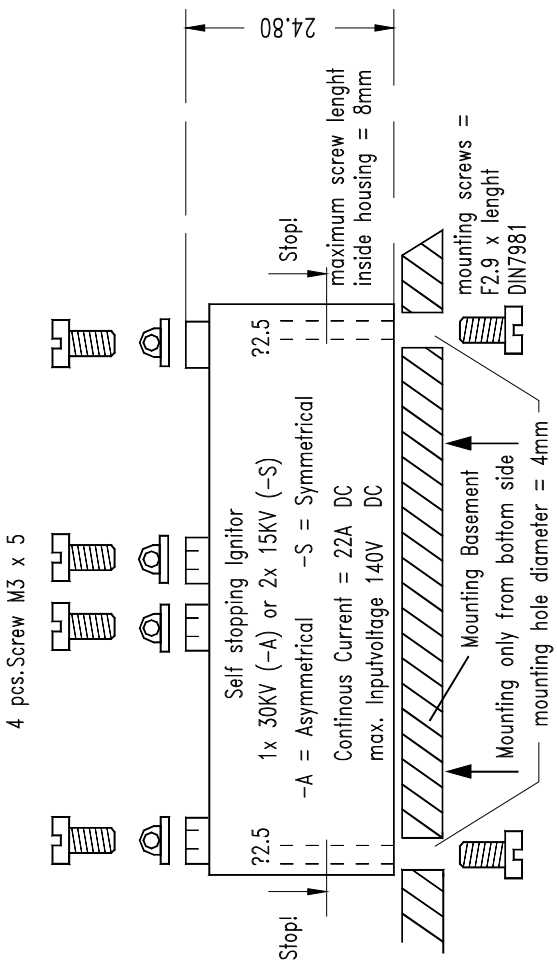


- This terminal can be used for different applications:
- Reset for Lifetimecounter
  - On - Off control by switch or contact
  - inverting for on - off control when use opto on-off
  - predefined dim-steps
  - data output for simple operating parameter
  - all above ideas are subject to change by software and are not presently installed

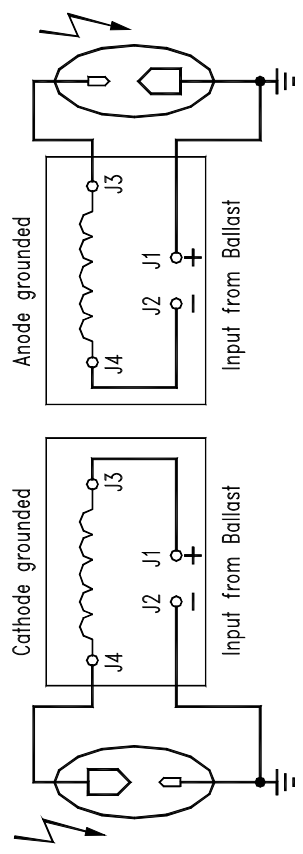
### Functions at the Optionboard



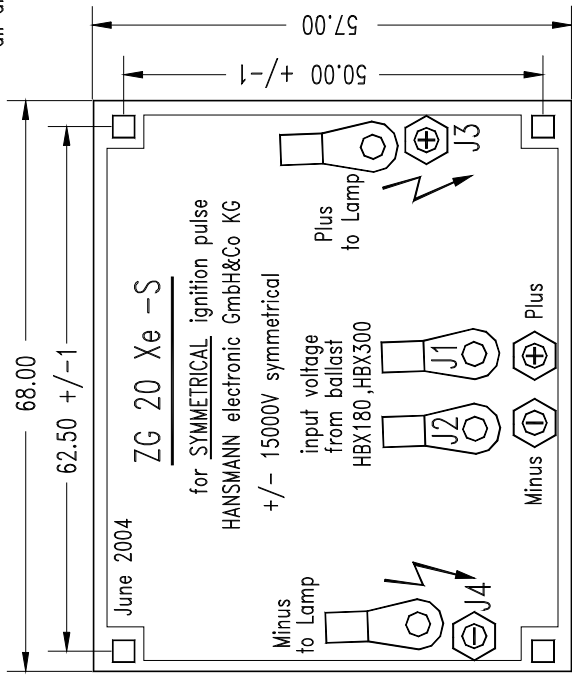
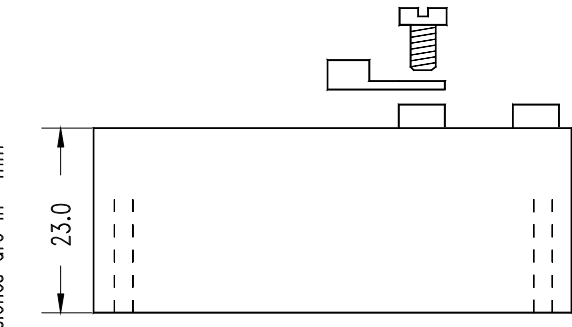
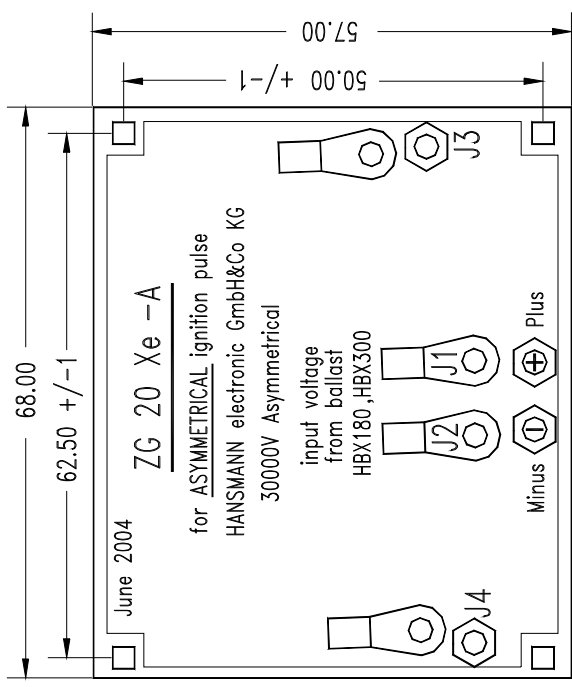
# Application hints for using Asymmetrical Ignitor ZG 20 Xe-A



Operation Mode	Junction	Lamp connection
if lamp is grounded with minus side	connect J1 with J3	minus to J2 plus to J4
if lamp is grounded with plus side	connect J2 with J4	minus to J3 plus to J1



all dimensiones are in -mm-



<b>HANSMANN Electronic GmbH &amp; Co. KG</b>	<b>October 2010</b>		<b>Technical Information</b>
<b>Specification</b>	<b>HBX300</b>		<b>Edition: 2.74</b>
Ballast for 100 to 350W-short arc discharge lamps	Datasheets:	11 Pages	<b>Status:</b> <i>Valid</i>

Please read this information carefully, before installing and operating the power supply!



## Hansmann Electronic GmbH & Co.KG

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**Electronic Ballast “HBX 300”, “HBX 300-Y and “HBX 300-V” requires use of ignitor ZG 20Xe-(A/S)**

<b>Order Code:</b>	<b>HBX 300</b>	Standard Version
	HBX 300-V	Version with additional plug for rectified 380V output for connection with low voltage power supply QD-3023
	HBX 300-E	Version designed for EmArc lamps with lamp voltages between 50 and 90V, igniter ZG501Pro-S required
	HBX300-Y	Version with low leakage current, requires medical EMI-Filter
	ZG 20Xe-A	Ignitor with asymmetric ignition
	ZG 20Xe-S	Ignitor with symmetric ignition
	QD-3023	Optional low voltage power supply for connection to 380V-output

### **OSRAM-Lamps:**

XBO 250 W OFR  
XBO 300W/60 C OFR

Higher Wattages in cascaded operation

### **Ushio Lamps:**

250W Xe  
300W Xe

### **Perkin Elmer Lamps:**

ME300B-X

### **Features:**

- Power supply for xenon filled short arc lamps
- Designed for Xenon short arc lamps rated **from 200 to 300W**
- Output power customer selectable by DIL/16step –switch
- Capable to drive lamp voltages ranging from **10 to 29V, ver. E 50 to 90V**
- Certified by **OSRAM** and **USHIO, IEC(UL) 60601 approval**
- Input voltage range from **90V AC to 264V AC**, power factor corrected line input, built-in EMI-filter: meets CE and FCC part “A”
- $\mu$ P controlled, digital power management with high output stability over lamp Lifetime
- Output short circuit protected and “Arc to Ground” protected
- Galvanic separation of lamp output and line input, thermal shut off at 90°C
- Shut off function for end of life and lamp fail parameter
- Ballast cascadable for use for higher wattage Xenon lamps
- Auxiliary regulated 24V/ 0.2A output for fan drive (available only when lamp lit)
- Flexible Design: new lamps and functions adaptable by software
- Other lamps on request

Revisions of:

Specification of HBX 300 (Y/V/E)

Date	Revision	Description
March 2004	1.0	First Release
May 2006	1.5	Second release after re-design (changed internal control, power curves added)
Feb 2007	2.0	New format + features (PWM-dimming, connection to QD-3023)
Apr 2007	2.1	Omitting DC-input
Sep 2007	2.2	Updated Power Curve
Jan 2008	2.4	Perkin Elmer Lamp ME300-X listed
Mar 2009	2.6	Maximum output current increased to 22A, version HBX300-E added Version S delisted
Apr 2009	2.62	Output voltage and output current for version E corrected
May 2009	2.64	Maximum ambient operating temperature reduced to 40 degrees C
Apr 2010	2.7	Updated Power Curve with 22A maximum current and optional fixed current curves
Oct 2010	2.72	Operation hour and ignition attempts counter added
Dec 2010	2.74	Mechanical outline file updated, circuitry of option board corrected

## Electrical Data

All values are valid at  $25 \pm 5^\circ\text{C}$ , unless otherwise noted

### Input Data

Nominal Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Input voltage AC Line	U	V AC	100-240	90 - 264	
Input voltage DC-Line	U	V DC	DC-input not allowed as fuse is not compatible		
System wattage	$P_{LI}$	W		150 -390	depends on select
Input current	$I_{LI}$	A		0.6 – 4.3	depends on select
Line frequency	$F_{in}$	Hz	50/60	47 – 63	
Line Power factor	PFC	1	1.0	0.92 to 1.0	
Leakage Current to PE	$I_{Leak\_SA}$ $I_{Leak\_QD}$	$\mu\text{A}$	<150 <300		Standalone Combined w. QD-3023

Other Operation Data	Symbol	Unit	Nominal	Tolerances	Remarks
System wattage during ignition	$P_{ign}$	W	25	<30	
System wattage standby-operation	$P_{LIStby}$	W	1	0.5 – 2.0	

### Lamp Output Data

Ignition	Symbol	Unit	Nominal	Tolerances	Remarks
Ignition voltage with ZG 20Xe	$U_{ign}$	$\text{kV}_{peak}$	$\pm 14$	$\pm 12 - \pm 16$	Load capacity <20pF
Ignition time automatic restart counter	$t_{ign on}$	sec.	1 5	0.9 – 1.1 --	attempts

Run-up Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Run-up Current @ 15V Lampvoltage	$I_{max}$ $I_{max}$	A A	10, 12 16, 22 10 (ver E)	+/-10% Max.	Inside specified lamp-parameter (select by S1)
In rush Current	$I_{max}$	A	30		0 to 1ms

Nominal Operation	Symbol	Unit	Nominal	Tolerance s	Remarks
Lamp voltage	$U_{La}$	V	10 - 29 10 - 120	+/-5% +/-5%	Depends on lamp select
Lamp wattage	$P_{La}$	W	100 to 300 (see table) 270, 350 (ver E only)	+/-2%	Selectable by Mode Sw.
Lamp current	$I_{La}$	A	Up to 22 up to 10 (ver E only)		Depend on select
End-Of Life-Cut off voltage	$U_{La, max}$	V	30 90 (ver E only)	+/-2V +/-6V	After run-up completed
End-Of-Life-Cut off time	$t_{EOL-Off}$	S	< 0.2		
RF-Ripple of output power	$\Delta P_{La,rip} / P_{La}$	%	< 1 p-p		13V-30V
50Hz –60Hz Ripple		%	< 1 p-p	< 4 p-p	13V 30V
Shift in output power with shift in input voltage	$\Delta P_{La} / \Delta U_{LI}$	1		< 0.005	within nominal values
Open circuit voltage	$U_{ocv}$	V	110 230 (ver E only)	105 –115 200 – 260	

## LIFETIME DATA

All values for  $U_u = 230 V_{mrs}$   
 Temperature at test point = 70°C

	Symbol	Unit	Nominal	Tolerances	Remarks
ballast lifetime	$t_{life}$	h	25.000	> 25.000	acc. To MIL HDBK for nominal operation

## MISCELLANEOUS DATA

<b>Nominal Operation</b>	Symbol	Unit	Nominal	Tolerances	Remarks
Power losses at 115V at 230V	$P_V$	W	20 – 65 15 - 55	+/-	Depends on power select
Efficiency	$\eta$	1	0.83	0.8 – 0.9	Depend on Lamp current
Ambient temperature	$T_A$	°C	+ 25	-10 - +40	non condensing
Maximum temperature at test point	$T_c$	°C	+80		Case surface near output at U-profile
Internal temp. switch off temperature	$T_{c-off}$	°C	+90	+85 - +95	At heatsink no de-rating till switch off

<b>Standby Mode</b>	Symbol	Unit	Nominal	Remarks
Minimum mains shut-off time for restart	$T_{reset}$	s	3	Standby mode is present when the lamp doesn't light 1. when ignition hasn't been successful 2. when lamp output is shorted 3. when lamp extinguishes while running

<b>Geometry and Weight</b>	Symbol	Unit	Nominal	Tolerances	Remarks
Length	$l$	mm	180	+/-1	See dwg.
Width	$w$	mm	102	+/-1	See dwg.
Height	$h$	mm	43	+/-1	see dwg.
Housing					open case Al-profile
Weight	$W_B$	Kg	0.7	+/-0.05	

<b>Wiring length</b>	Symbol	Unit	Nominal	Tolerances	Remarks
Between ignitor and lamp	$L_{il}$	mm		t.b.d.	As short as possible
Between ballast and ignitor	$L_{bl}$	mm	t.b.d.	t.b.d.	External Ignitor ZG 20Xe

<b>Cooling method</b>	Symbol	Unit	Nominal	Remarks
airflow		meter per second	Built in fan	Must be checked in actual application

<b>Plugs and Cables</b>	Manufacturer / Type	Remarks / Header/Contacts
Ballast mains plug	CN 1 AMP/MTA-156-3- 643495-2 Wiring with AWG 18, 105°C, 900V, (recommended)	See drawing on page 6
Ballast interface plug	ST 2 JST / B2B-EH-A Non isolated to line voltage CAUTION !	See drawing on page 6
Auxiliary 380V plug HBX 300-V only	ST 6 JST B2P3-VH-B	See drawing on page 6
Fan connection plug	ST 3 / ST 4, JST / B2B-EH-A for internal 24V Fan, ST4 for aux use 100mA, Non isolated to line voltage	See drawing on page 6
Connection Ballast-Ignitor	J1 =+, J2=- Faston 6.3mm x 0.8mm	
Option plug	ST101 Molex 53261-490 or 53261-0471 Functions: See drawing on page 6	See drawing on page 6
Ignitor HV-plug to lamp Lamp cable	By screw M3	

### PIN Assignment and Fuse

Connector		Signal	Status	Description
Line input CN 1	PIN 3 PIN 2 PIN 1	AC in -L- AC in -N- PE		AC - wide range input Voltage 90V – 264V  Safety Ground
ST 3 and ST 4 Fan drive JST B2B –EHA	PIN 1 + PIN 2 -	Fan +24V Fan – (0V) 200mA max. (both outputs)		Caution: Fan drive output voltage is only available, when lamp lit.
Lamp output Terminal J1, J2	J 1 + J 2 -	Plus Lamp Voltage Minus and Power		Connection to external Ignitor ZG 20Xe
Option Board terminal ST101 opto-isolated	Pin 1 Pin 2 Pin 3 Pin 4	Dim (PWM with 100Hz) On-Off Lamp Lit feedback Secondary GND		Dim-Input to ballast (100% duty cycle=min P) Function depends on lamp select Conductive to Pin 4 = lamp lit Common GND relative to Pin 1,2 and 3 Further information, refer to drawing
Fuse		Fixed built -in T 5A/ 250V		CAUTION! For Continued Protection Against Risk of Fire, Replace Only with Same Type and Rating of Fuse

Standards	
Safety and performance Certifications	UL 60601-1, IEC 60601-1 (CB) CB- Test, and UL must be completed with the final product
RFI – (Radio Frequency Interferences) (Funkentstörung)	has to be done with complete assembled project, built-in EMI-filter, that meets CE and FCC (A) requirements, for “B” an additional Filter is recommended (has to be tested with final product)

Environmental Requirements	Ambient conditions	Remarks
Storage Temperature Range	-20°C - +60°C	
Operating Temperature Range	-10°C – 40°C	Depend on cooling
Humidity Range	20% - 95% non condensing	
Altitude operating	0 Ft. to 10000 Ft.	
Altitude not operating	0 Ft. to 40000 Ft.	
Vibration operating	$G_{rms}$ , 5 Hz to 500 Hz random 10min x y z axis	t.b.d. not tested
Vibration not operating	$G_{rms}$ , 5 Hz to 500 Hz random 10min x y z axis	t.b.d. not tested
Shock operating	$G_{rms}$ , ½ sine wave, 11ms x y z axis	t.b.d. not tested
Shock not operating	$G_{rms}$ , ½ sine wave, 11ms x y z axis	t.b.d. not tested

Specifications subject to change without notice

### Power Adjustment by Switch S1 Mode sw

S1	Power	Function	
0	150W	on without signal	Const. P=150W ver. E: 270W on without signal
1	180W	on without signal	Const. I = 12A ver. E: 350W on without signal
2	200W	on without signal	Const. P=200W, I_Max=15A
3	250W	on without signal	Const. P=250W, I_Max=20A
4	300W	on without signal	Const. P=300W, I_Max=22A
5	100W	on without signal	Const. I = 7A, P_Max=125W
6	180W	on without signal	Const. P=180W, I_Max=13A
7			
8			
9	180W	off without signal	Const. P=180W, I_Max=13A
A	100W	off without signal	Const. I = 7A, P_Max=125W
B	150W	off without signal	Const. P=150W ver. E: 270W off without signal
C	180W	off without signal	Const. I = 12A ver. E: 350W off without signal
D	200W	off without signal	Const. P=200W, I_Max=15A
E	250W	off without signal	Const. P=250W, I_Max=20A
F	300W	off without signal	Const. P=300W, I_Max=22A

USHIO Lamp Series USH----,UXM---,UXL---,UXR---, with corresponding power-  
OSRAM Lamp Series XBO---- and HBO--- with corresponding power-  
- and **rated** voltages below 24V

The above described function “on or off without signal” is available at ST2. Without signal means open or +5V. The signal function is active, when both pins are shorted by contacts (relay, push button contacts a.s.o.) or opto-coupler-transistor.

CAUTION: these pins are connected to line input voltage.

The ballast is equipped with an internal counter that counts the number of operation hours as well as ignition attempts. This feature can only be used by the factory or an appointed service representative.

The remaining switch positions are open for customized functions or different lamp specification.



## Optional DC-DC-converter QD-3023 in combination with HBX 300-V

DC Output Characteristics				
	V1	V2	V3	V4 (Prim. Side)
Output Voltage	+3.3V	+5.2V	+12.35V	+Vcc
Max. Load	1.5A	1.5A	1.0A	100mA
Nom. 1 Load	0.4A	0.6A	0.8A	80mA
Nom. 2 Load	0.4A	1.5A	0.5A	50mA
Nom. 3 Load	1.3A	1.3A	0.5A	20mA
Nom. 4 Load	1.0A	0.3A	0A	0mA
Nom. 5 Load	0A	0.3A	1.0A	0mA
Minimal Load	0A	0A	0A	0mA
Overall Reg. %	+/-5%	+/-5%	11.4-13.8V	14.5V +/- 1.5V
Ripple & Noise	50mV	50mV	100mV	100mV

**Note:** The maximum allowed ripple/noise output of the power supply is measured over a bandwidth of 0Hz to 20MHz at the power supply output terminals. A 10 $\mu$ F electrolytic capacitor in parallel to a 0.1 $\mu$ F ceramic capacitor are placed at the point of measurement. The DCDC-converter is powered on using minimal load and is then switched to nominal or maximum load.

Output Rise times	Symbol	Unit	Nominal	Tolerances	Remarks
10 to 90% upon power up	$t_{10,90}$	ms	20	Max	
All voltages within Spec.	$t_{up}$	s	3	Max	.

Geometry and Weight	Symbol	Unit	Nominal	Tolerances	Remarks
Length	l	mm	67	+/-0.5	See dwg.
Width	w	mm	41	+/-0.5	See dwg.
Height	h	mm	17	+/-0.5	see dwg.
Housing					PCB
Weight	$W_B$	g	37	+/-1	

### PIN Assignment and Fuse

Connector		Signal	Status	Description
DC input connector J1	PIN 1	+400V		Input Voltage 100 to 400V for minimal load, nominal 4 and nominal 5 load Input volt. 300 to 400V for nominal/max load V4=Vcc
	PIN 2	n/c		
	PIN 3	Pri. GND		
	PIN 4	+14.5V		
DC output connector J4	PIN 1	+3.3V (V1)		Isolated Output on secondary side
	PIN 2	+3.3V (V1)		
	PIN 3	Secondary GND		
	PIN 4	+5.2V (V2)		
	PIN 5	Secondary GND		
	PIN 6	+12.35V (V3)		
	PIN 7	Secondary GND		

Standards	
Safety and performance Certifications	UL(CUL) 1950, EN60950 (TUV), CB-report available CB- Test, and UL must be completed with the final product
RFI – (Radio Frequency Interferences) (Funkentstörung)	has to be done with complete assembled project, built-in EMI-filter, that meets CE and FCC (A) requirements, for “B” an additional Filter is recommended (has to be tested with final product)

## *Additional hints for use and safety:*

### **1. Safety**

Because of instant hot restrike, the output voltage to the lamp can reach values of up to +/-15000 Volts! Please ensure minimum 15mm clearance between all lamp terminals to PE, to prevent arc to ground situation!! Primary wiring has to meet national requirements for electric safety!

### **2. Lamp power selection:**

By multimode 16-step switch (0-F). (see table above)

### **3. Fan drive output**

The unit has two 24V output terminals for driving one or two fans. One is intended for the power-supply and one for the lamp. The maximum output current for both outputs is total 200mA.

The 24V output voltage is only available, when the lamp is in operation.

CAUTION! This terminal is connected to line voltage!

### **4. Cooling**

This unit is assembled with an internal fan, which ensures proper operation at ambient temperatures up to 40°C. Nevertheless it is necessary to keep air in-and – outlet free.

In all cases, the temperature at the temperature test point should be tested to ensure most reliable operation. This temperature should not exceed 80°C.

Temperature overload is protected by an internal temperature switch at 90°C at the internal heatsink.

### **5. Fuse and Safety**

**CAUTION!** For Continued Protection Against Risk of Fire, Replace Only with same Type and Rating of Fuse! The fuse is a fixed built- in component with T5A / 250V rating.

If the fuse has failed, the power-supply must be returned to the factory for repair.

### **6. Increasing reliability and functions**

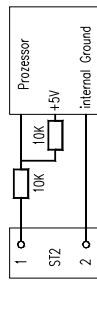
Custom modifications of power curves and adaption to other lamp types are possible upon request.

7. Please see the following pages for additional information about wiring, mounting and operating data.

# HBX300

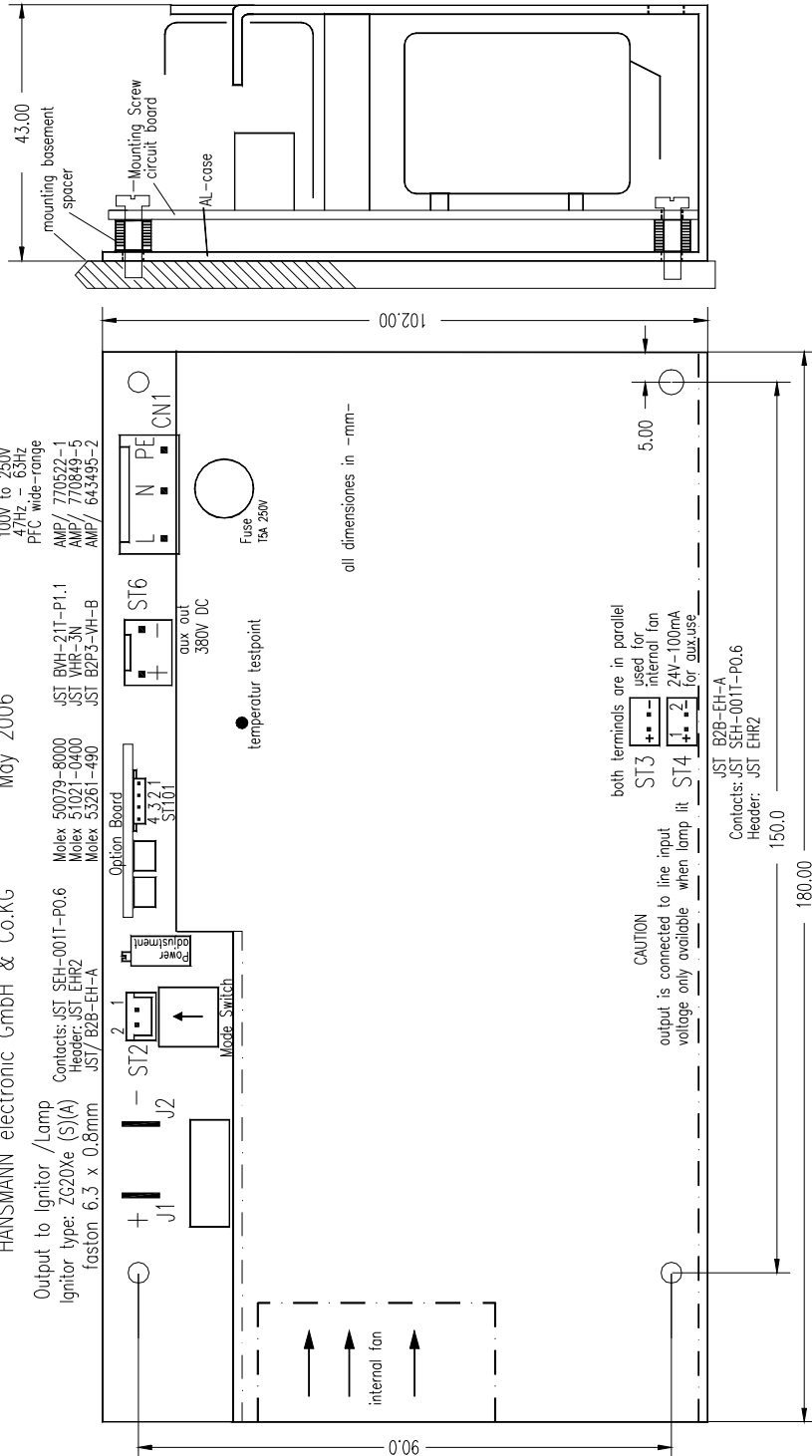
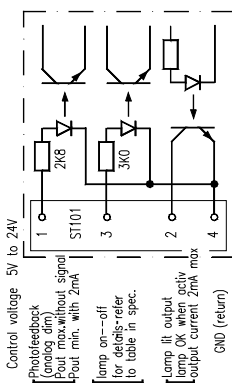
Electronic Powersupply for low voltage high current  
 metal halide discharge lamps up to 300W and 22 Amps  
 HANSMANN electronic GmbH & Co.KG May 2006

Use of non isolated control terminal ST2

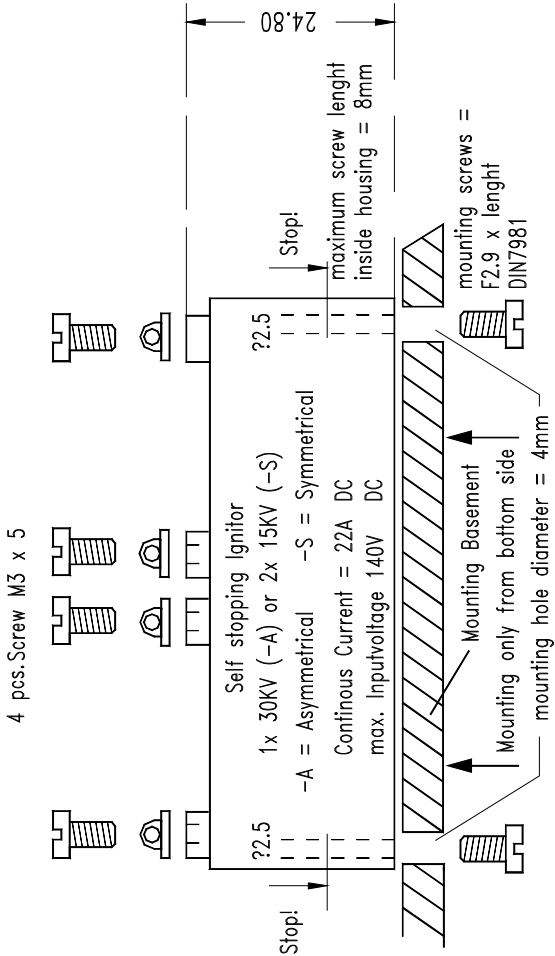


- This terminal can be used for different applications:
- Reset for Lifetimecounter
  - On - Off control by switch or contact
  - inverting for on - off control when use opto on-off
  - predefined dim-steps
  - data output for simple operating parameter
  - all above ideas are subject to change by software
  - and are not presently installed

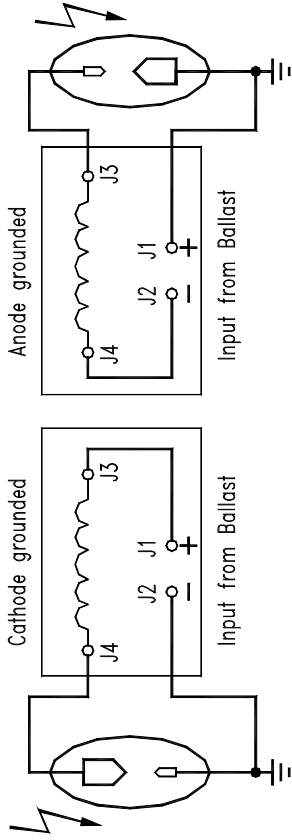
### Functions of the Optionboard



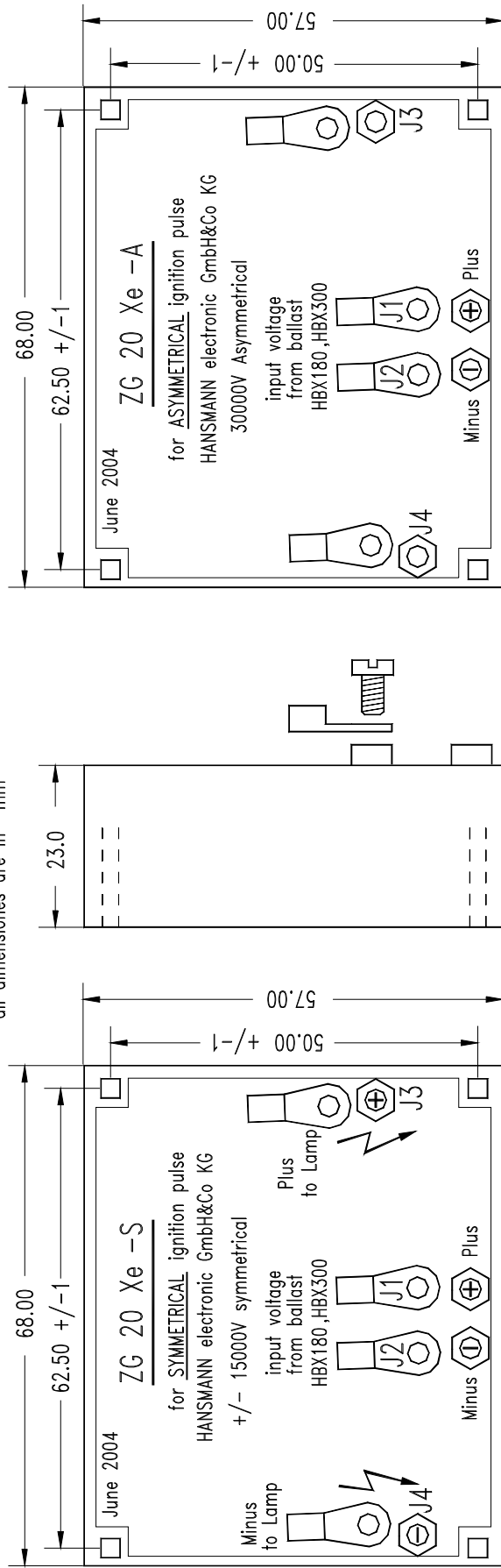
# Application hints for using Asymmetrical Ignitor ZG 20 Xe-A



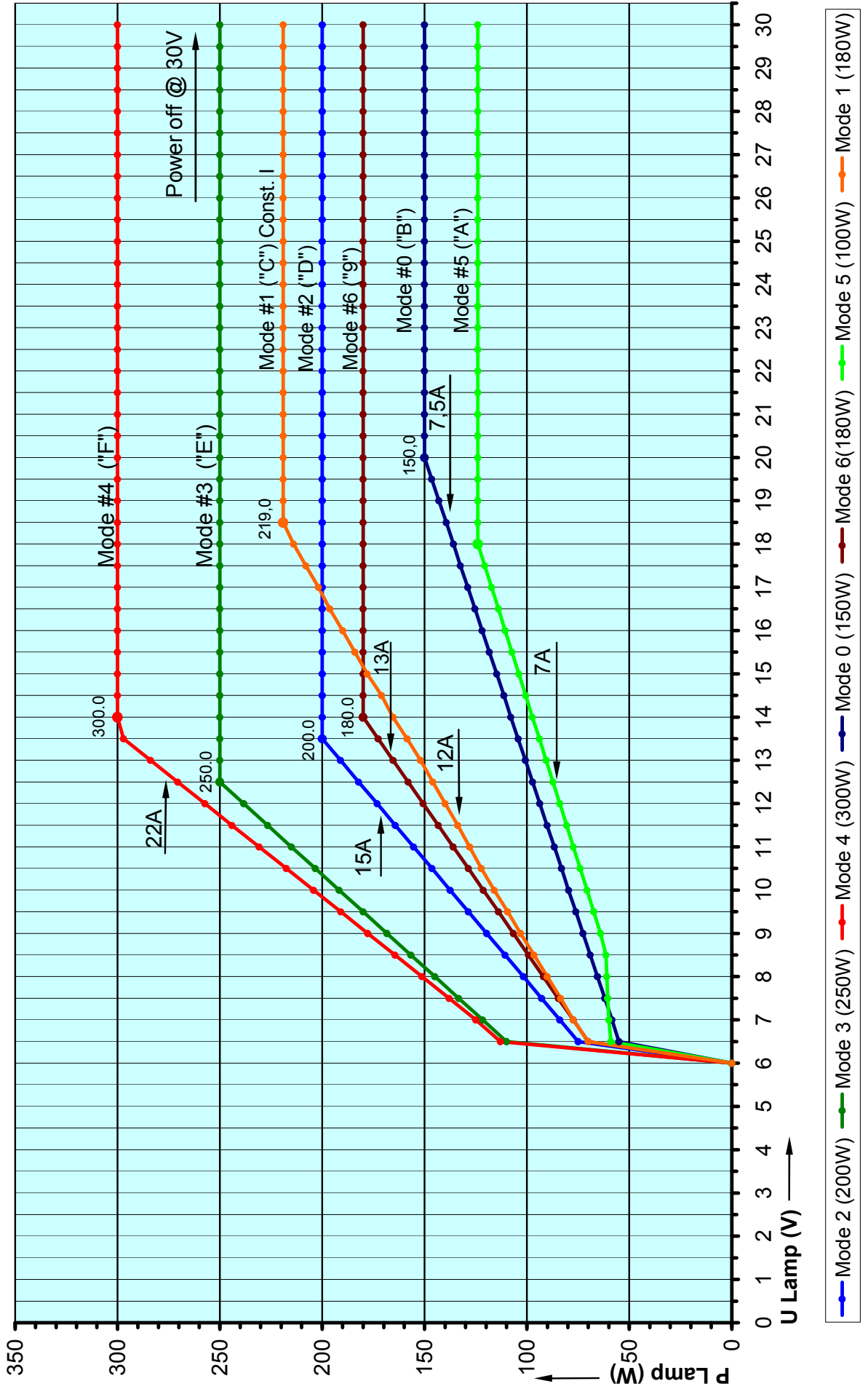
Operation Mode	Junction	Lamp connection
if lamp is grounded with minus side	connect J1 with J3	minus to J2 plus to J4
if lamp is grounded with plus side	connect J2 with J4	minus to J3 plus to J1



all dimensiones are in -mm-



# HBX300 Output Power by Mode Selection (100W - 300W)



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