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Analoge & Digitale
Leistungselektronik
GmbH



Katalog Catalogue 25



+ DC-Power Supplies + Pulsed DC-Generators

+ Medium Frequency / Bipolar Generators



GXB

UNRIVALED!

HXB



Pulsgeneratoren von 3 kW bis 280 kW

Pulse Generators from 3 kW to 280 kW

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ADL - Leistungselektronik „Made in Germany“

ADL ist Entwickler und Hersteller von Stromversorgungen und Generatoren für Dünnschichtbeschichtung sowie Leistungselektronik für spezielle Industrieanwendungen und Forschungseinrichtungen.

1992 wurde die ADL Analoge & Digitale Leistungselektronik GmbH in Riedstadt / Hessen gegründet.

2001 eröffnete ADL einen zweiten Standort in Groß-Gerau, um die Produktionskapazitäten zu vergrößern.

2011 erfolgte der Umzug beider Standorte nach Darmstadt (nahe Frankfurt / Main) in ein wesentlich größeres, eigenes Firmengebäude.

Unsere Produkte sind bekannt für ihre Zuverlässigkeit, Langlebigkeit und hohe Fertigungsqualität, aber auch für technisch innovative Konzepte. Wir nehmen die Bezeichnung „Made in Germany“ ernst und verfügen über eine sehr umfangreiche eigene Fertigung, vom Bau von Transformatoren über die Kabelkonfektionierung, die Elektronikbestückung, die Baugruppenfertigung und Endmontage bis zur eigenen Mechanikfertigung mit modernsten CNC-Maschinen.

ADL – Power Electronics "Made in Germany"

ADL is developer and manufacturer of power supplies and generators for thin film coating, as well as for power electronics for special industrial applications and research institutes.

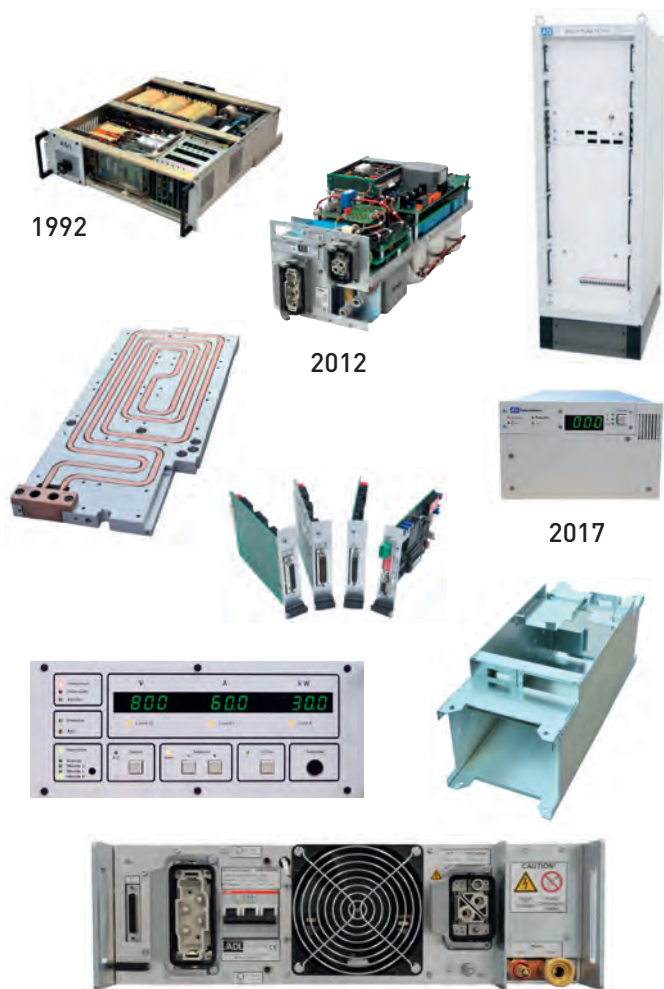
1992 ADL Analoge & Digitale Leistungselektronik GmbH was founded in Riedstadt / Hessen.

2001 ADL opened a second plant in Gross-Gerau to enlarge the production capacities.

2011 both locations moved to the city of Darmstadt (near Frankfurt / Main) into a much larger company owned factory building.

Our products are well known for their reliability, longevity and highest production quality, as well as for very innovative technical concepts. We take the designation "Made in Germany" very seriously: ADL has a very broad own production, such as the manufacture of transformers, cable termination, module assembling, final mounting, PCB-mounting and our own mechanical production with modern CNC machines.

ADL Leistungselektronik für höchste Anforderungen ADL Power Electronics for highest Demands



Innovativ, kompakt, solide - von 1992 bis heute und in Zukunft

Innovative, compact, solid - since 1992 until today and in the future

Zuverlässige Kühlung auch bei hohen Umgebungstemperaturen

Reliable cooling - even at high ambient temperatures

"Plug and Play" - Einfache Bedienung durch automatisierte Funktionen

"Plug and Play" - easy handling through fully automatic functions

Stabile Gehäuse

Solid housing

Übersichtliche Information durch LED-Digitalanzeigen

Clear information through LED digital display

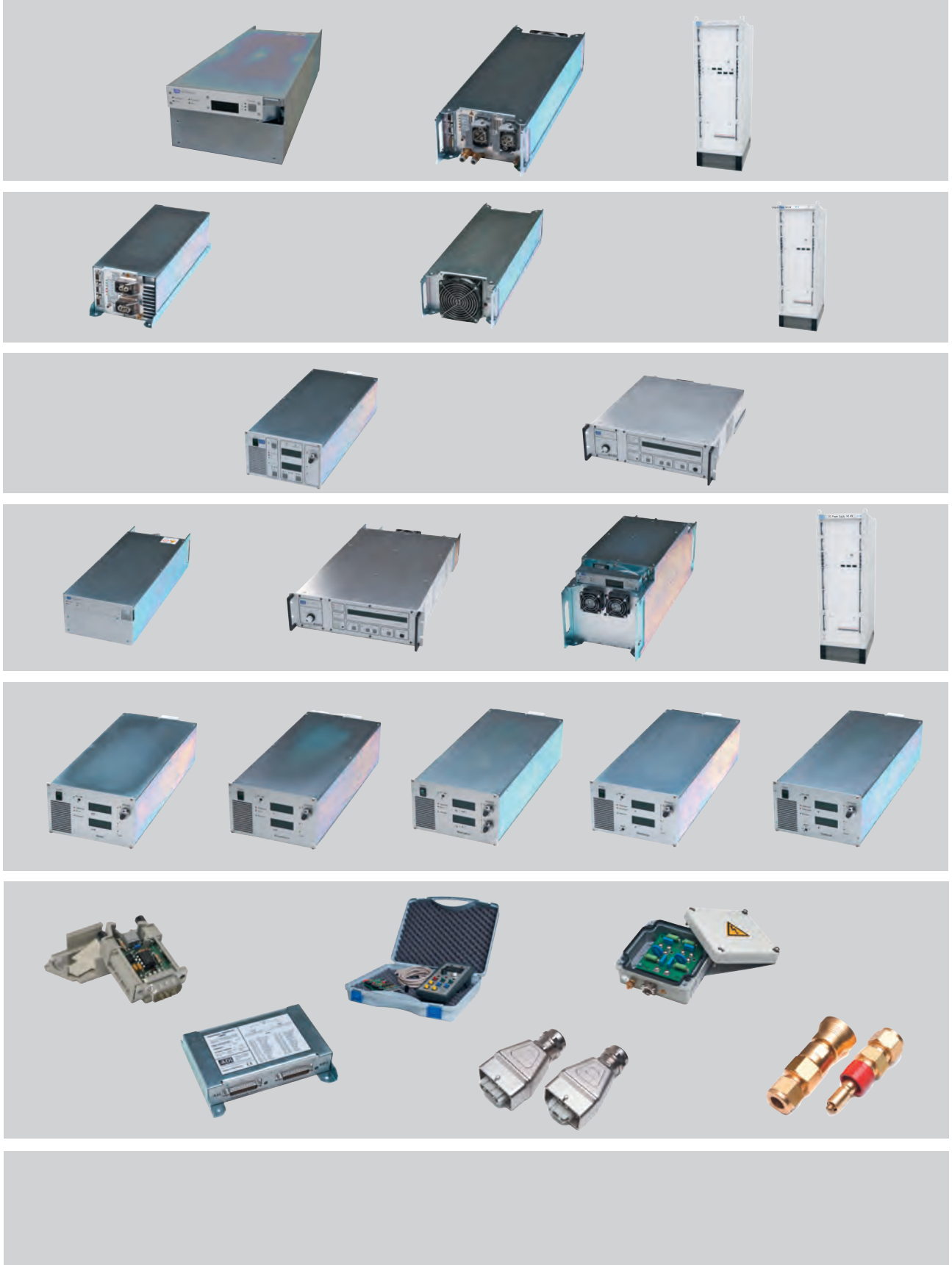
Sichere Verbindung und schnelle Montage durch genormte Industriesteckverbindungen

Secure connection and fast mounting through standardized industry connectors

Process	Description	Type of Unit
BIPOLAR - SPUTTERING (for reactive coatings)	Bipolar Pulse Generators	GXB SB HXB
UNIPOLAR - SPUTTERING (for ARC-critical and partly reactive applications)	Unipolar Pulse Generators	SD HXD
DC - SPUTTERING AND - ETCHING (for laboratory applications, mainly with active display)	DC-Power Supplies Air cooled	GS
DC - SPUTTERING AND - ETCHING (for industrial applications)	DC-Power Supplies Water cooled	GX GSW HX
POWER SUPPLIES for ION SOURCES	Accelerator, Beam, Neutralizer, Discharge, Cathode	GG, GIP, GDI, GC

Neben unseren Seriengeräten bieten wir auch kundenspezifische Sondergeräte an, die in diesem Katalog nicht enthalten sind.

Additionally to the series production ADL also offers special power supplies on customer request, which are not in this catalogue.



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Unipolar und Bipolar Pulsgeneratoren - der neue Standard für reaktive Prozesse

Die Pulstechnik bietet große Vorteile (bessere und reproduzierbare Beschichtung bei höherer Wirtschaftlichkeit) gegenüber MF-Sinusgeneratoren.

Die Pulstechnik hat daher die veraltete Sinustechnik abgelöst.

Vorteile des ADL Pulssystems

- Modulares Baukastensystem erlaubt die Kombination der HX (DC) mit einem Unipolar (SD) oder einem Bipolar Pulsgenerator (SB)
- Kombination von Geräten im Master-Slave- oder Parallelbetrieb bis 280 kW möglich
- Kompaktes ½ 19" Design
- Bipolar Pulsgenerator mit PWM-Regelung garantiert absolut symmetrisches Sputtern!
- Exzellentes super schnelles und vollautomatisches Arc-Management
- Prozessreproduzierbarkeit: besser als 2 %



SD 30 and
SD 150 / SD 151



SD 300 / SD 301 / SD 351



HX + SB 300 as practical stack

Unipolar and Bipolar Pulse Generators - the new Standard for reactive Processes

Pulse technology offers a wide range of advantages (advanced quality and reproducible coating and at the same time higher profitability) in comparison to MF-Sine generators. Therefore pulse technology has replaced the out-of-date sine technology.

Advantages of the ADL Pulse System

- Modular system allows combination of HX (DC) with Unipolar (SD) or Bipolar Pulse Generator (SB)
- Combination of units in Master-Slave or parallel operation up to 280 kW
- Compact design ½ 19"
- Bipolar pulse generator with PWM-control guarantees absolute symmetric sputtering!
- Excellent ultrafast and fully automatic arc management
- Process reproducibility: better than 2 %



HXB



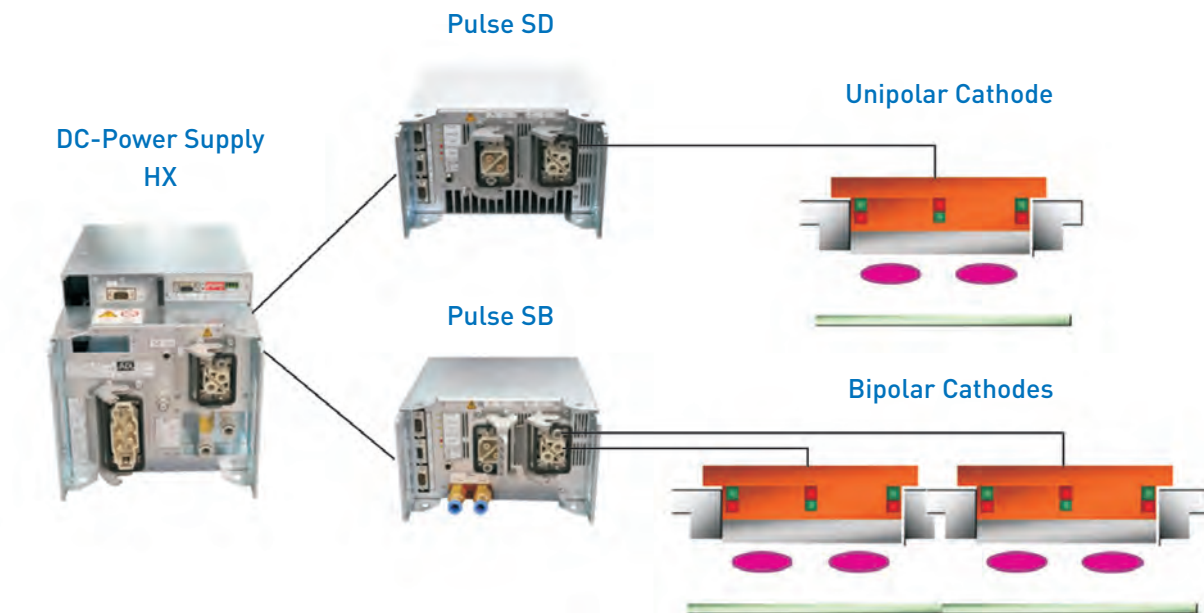
GXB 50

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Anwendungen / Applications Series SD

- Große Bandbreite an Sputteranwendungen mit wenig leitfähigen Targetmaterialien
- Exzellente Prozesskontrolle für semi-oxidierte Targets, z. B. TiO_x , NbO_x ...
- Stabile Prozesse auch bei Arc-kritischen Targets wie AZO
- Unipolar voll reaktive Beschichtungsprozesse wie SiO_2 , Si_3N_4 , Al_2O_3 , TiO_2 für Targetgrößen bis 300 mm Durchmesser
- Verbesserung des Materialverhaltens
- Wide range of sputtering applications with low conductive targets
- Excellent process control for semi oxidized Targets, e.g. TiO_x , NbO_x ...
- Stable processing with arc-critical targets like AZO
- Unipolar full reactive coating processes like SiO_2 , Si_3N_4 , Al_2O_3 , TiO_2 for target sizes up to 300 mm diameter
- Improvement of material performance

Unipolar or Bipolar Pulse-Sputtering with SD or SB and HX



Anwendungen / Applications Series SB

- Bipolar voll reaktive Beschichtungsprozesse wie SiO_2 , Si_3N_4 , Al_2O_3 , TiO_2 für Kathoden bis 4 m Länge
- Exzellente Prozesskontrolle für semi-oxidierte Targets, z. B. TiO_x , NbO_x ...
- Symmetrischer Betrieb (50 : 50 %) und asymmetrischer Betrieb (bis 10 : 90 %) möglich
- Bipolar full reactive coating processes like SiO_2 , Si_3N_4 , Al_2O_3 , TiO_2 for cathodes up to 4 m length
- Excellent process control for semi oxidized targets, e.g. TiO_x , NbO_x ...
- Symmetrical operation (50 : 50 %) and asymmetrical operation (up to 10 : 90 %) possible

Bipolar Pulsgenerator GXB 50

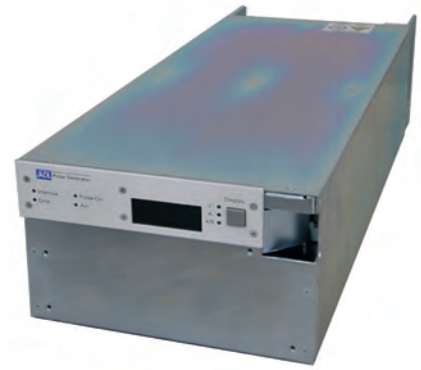
Der Bipolar Pulsgenerator erzeugt eine Rechteckwechselspannung zur Plasmaanregung zwischen zwei Kathoden. Ein 5 kW-DC-Netzteil ist bereits integriert, so daß keine externe DC-Stromversorgung benötigt wird.

Der Generator arbeitet mit einer fest eingestellten Frequenz von 22,5 kHz. Die Puls- und Pausenzeiten werden nicht als feste Parameter vorgegeben, sondern automatisch geregelt.

Mit einer speziellen Stromquotientenregelung werden die Leistungen der beiden Halbwellen mittels Pulsbreitenmodulation auf ein vorgegebenes Verhältnis geregelt.

Der Bipolar Pulsgenerator besitzt eine automatische Arc-Unterdrückung. Die Parameter für Triplelevel und Pausenzeiten werden automatisch an den jeweiligen Prozeß angepaßt. Die übliche Programmierung durch den Benutzer ist nicht erforderlich!

NEW!



GXB front view



GXB rear view

***Highlights

- * Output power 5 kW, AC
- * Current ratio controller
- * Automatic arc handling
- * Water cooling
- * Very compact design
- * ½ 19"-case, 3 HU

Bipolar Pulse Generator GXB 50

The Bipolar Pulse Generator GXB generates a square-wave AC-voltage for plasma excitation between two cathodes. A 5 kW-DC-power supply is already integrated, so that no external DC-power supply is necessary.

The generator works with a fixed frequency of 22.5 kHz. Pulse on time and pulse off time are automatically controlled and not preset as determined parameters. A special current ratio controller calculates the power of both half-waves and regulates them on the basis of Pulse Width Modulation (PWM) in a pre-defined proportion.

The Bipolar Pulse Generator is equipped with automatic arc suppression. The parameters for trip level and break time are automatically adjusted to the specific processes. Programming by the user is not necessary at all!

Type	AC-Output			Order-No.
GXB 50	22.5 kHz	+ / - 800 V	5 kW	11Z080

Options and Accessories	Order-No.
Interface AS 4	01Y001
Interface AS 4 F	01Y021
Interface AS 6	01Y061
Profibus Interface	01Y152
Interface RS 232 / 485	01Y181
Swagelok-Water Couplings straight	04Y020
Swagelok-Water Couplings angled	04Y040
SMC Water Connectors	04Y100
GXB-Connector Set X1 / X2 straight	03Y085
GXB-Connector Set X1 / X2 angled	03Y095
19" Mounting Angle	01Y095
19" Mounting Set Duo-GXB	03Y091
19" Mounting Set Single-GXB	03Y093
Remote Control RC 4	06Y401



GXB open view

Technical Data GXB 50	
	Medium Frequency / Bipolar Pulse Generator GXB 50
Output Power	5 kW
Output Voltage	+ / - 800 V
Output Current	+ / - 12 A
Control	Current-, voltage, power controlled or voltage controlled with ignition automatic
Modes of Operation	External via A/D interface AS 4, AS 4 F, AS 6, Profibus or RS 232/485
Set Point	0 ... 100 % of nominal current, voltage or power
Output Accuracy	+ / - 1 % of nominal value for current, voltage and power
Automatic Balancing	Current ratio controller with pulse width modulation
Pulse Frequency	22.5 kHz, fixed
Parallel Circuit (Master-Slave)	no
External Synchronization	no
Arc Suppression	Automatic parameter setting
Quenching Time	< 2 μ S
Break Time	2 to 20 μ S
Arc Energy	0.3 mJ/kW at an output inductance of 3 μ H
Output Inductance	max. 10 μ H (cable + cathode)
Indications	3 ½ digit display for current, voltage and power
Noise Emission	LpA < 70 dB (A)
Mains Connection	3 x 400 V, + / - 10 %, 50 / 60 Hz
Power Consumption	ca. 6 kVA
Fusing	external 3 x 16 A
Cooling	Water, > 1.5 l / min, 2 to 8 Bar, < 40° C Forced air, maximum ambient temperature 40° C
Water Connection	Swagelok B-QC6 ...
Cooling Capability of Water	300 W
Cooling Capability of Air	100 W
Size	½ 19", 3 HU (130 mm) x 520 mm deep (without plug), 590 mm deep (with plug)
Weight	22 kg
Mains Cable	4 x 1.5 mm ²
Output Cable Type JZ-600-Y-CY	2 x 2.5 mm ²
Mains Connection (X2)	Harting Han-Modular Compact
AC-Connection (X1)	Harting Han-Modular Compact

ADL guarantees high-end Coating Quality for Lenses



Bipolar Pulsgeneratoren SB 150 und SB 300

Die Generatoren können sowohl als Mittelfrequenzgeneratoren zur Erzeugung eines symmetrischen Wechselstromes, als auch als Bipolarpulser für asymmetrische Rechteckimpulse verwendet werden. Mit einer speziellen Leistungsquotientenreglung kann die Targetlebensdauer für Dual-Magnetrons exakt symmetriert werden. Es können auch zwei unterschiedliche Targetmaterialien mit asymmetrischen Pulsleistungen geregelt werden. Der Quotientenregler stellt die Pulszeiten über eine Pulsweitenmodulation (PWM) automatisch ein.

Die Geräte arbeiten mit einer fest eingestellten Frequenz von 20 kHz. Die Generatoren verfügen über eine automatische Arc-Unterdrückung. Die Parameter für Triplelevel und Pausenzeiten werden automatisch an den jeweiligen Prozess angepasst. Die übliche Programmierung durch den Benutzer ist nicht erforderlich!

Mehrere Generatoren können über Steuerleitungen für eine Synchronisation verbunden werden. Die Geräte schalten dabei automatisch auf externe Synchronisation.



SB 300 front view



SB 300 rear view

Bipolar Pulse Generators SB 150 and SB 300

The generators can be used as medium frequency generators in order to generate symmetric AC current as well as bipolar pulse generators to generate asymmetrical square pulses. With a special power ratio controller the target lifetime for dual-magnetrons can be exactly symmetrized. Further, also two different target materials can be controlled with asymmetrical pulse power. The power ratio controller sets the pulse times via pulse width modulation (PWM) automatically.

The generators work with a fixed frequency of 20 kHz. The generators have an automatic arc suppression. The parameter for Triplelevel and Break time are automatically adjusted to the chosen process. Programming by the user is not necessary.

For an automatic synchronization multiple generators can be connected via control cables. In this case the pulse generators automatically switch to external synchronization.

***Highlights

- * Output power 15 kW, 35 kW, AC
- * Parallel operation up to 280 kW
- * Power ratio controller
- * Automatic arc handling
- * Automatic synchronization
- * Water cooling
- * Very compact design

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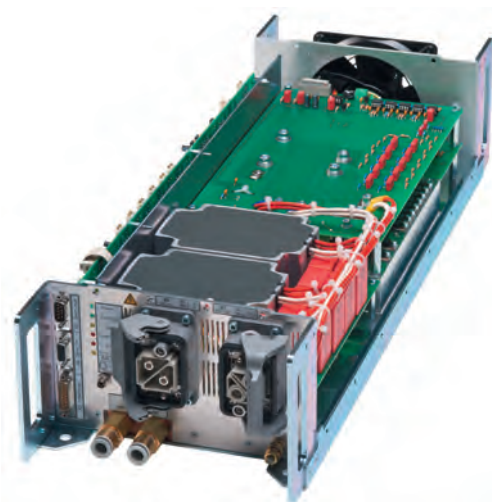
Variations

Type	AC-Output			Order-No.
SB 150	20 kHz	800 V	15 kW	11Z070
SB 300	20 kHz	800 V	35 kW	11Z050

Options and Accessories	Order-No.
SB-Swagelok-Water Couplings straight	04Y160
SB-Swagelok-Water Couplings angled	04Y170
SB 150-Connector Set X1 / X6 straight	03Y055
SB 150-Connector Set X1 / X6 angled	03Y075
SB 300-Connector Set X1 / X6 straight	03Y060
SB 300-Connector Set X1 / X6 angled	03Y080



HX + SB



SB 300 open, rear view

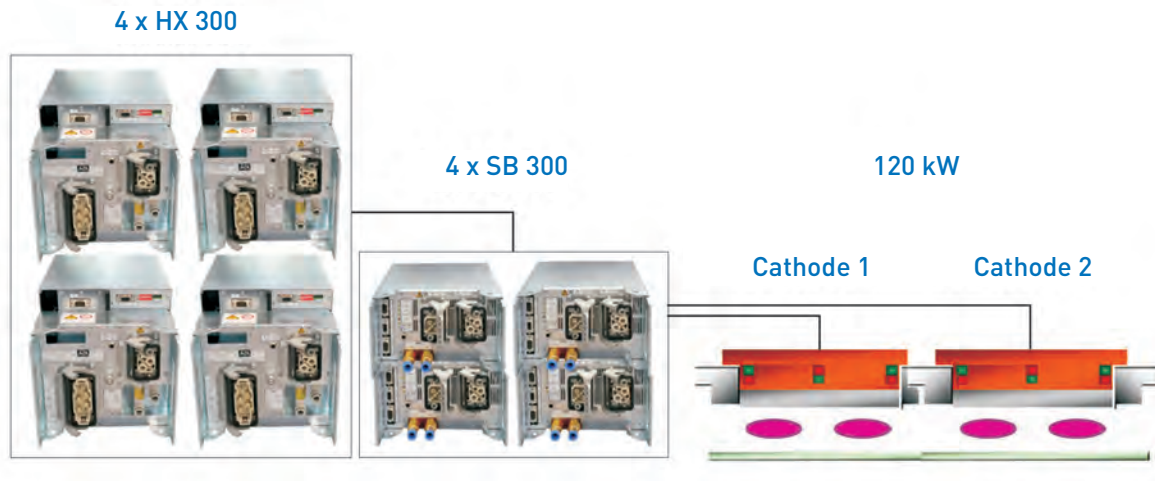


SB 300 open, front view

Technical Data SB 150 / SB 300		
	Bipolar Pulse Generator SB 150	Bipolar Pulse Generator SB 300
Input Voltage	Maximum 800 V DC	
Output Current	38 A (DC-Output current of power supply)	70 A (DC-Output current of power supply)
Output Power	15 kW (DC-Output power of power supply)	35 kW (DC-Output power of power supply)
Pulse Frequency	20 kHz, fixed	
Principle of Operation	AC, bipolar	
Arc Suppression	Automatic parameter setting	
Quenching Time	< 2 μ S	
Arc Energy	< 0.3 mJ/kW	
Input Cable Type JZ-600-Y-CY	2 x 6 mm ²	2 x 16 mm ²
Output Cable Type JZ-600-Y-CY	24 x 1.5 mm ²	
Maximum Cable Length	5 m (between pulse generator and cathode)	
Output Inductance	Max. 10 μ H (cable + cathode)	
Indications	Status LEDs	
Auxiliary Voltage	24 V DC + / - 10 %, 1.5 A	
Cooling	Water, >1,5 L / Min, 2 - 8 Bar, < 40°, Forced air, maximum ambient temperature 40° C	
Water Connection	SMC KQ2 10 mm (Option: Swagelok B-QC6 ...)	
Size	218 mm width, 130 mm height, 645 mm deep (without plug)	
Weight	23 kg	
Compatible with the following Power Supplies:	GX 60 - GX 150 (except all versions over 800 V or over 38 A). ONLY with interface X4P for pulse generators	HX 150 - HX 300 (except all versions over 800 V or over 70 A). ONLY with interface X4P for pulse generators

Example for an automatic synchronization for high power, e.g. 120 kW:

- DC HX is the base unit and can be combined with unipolar or bipolar pulse generators
- Combination of units in Master-Slave or parallel up to 280 kW
- Compact design 1/2 19"



Manufacturing Line of ADL Bipolar Pulse Generators SB 300 and DC-Power Supplies HX



Mittelfrequenz / Bipolar Pulsgenerator HXB 900 – HXB 1400

Medium Frequency / Bipolar Pulse Generator HXB 900 – HXB 1400

High power, compact and very fast!

- Reaktive Beschichtungsprozesse für Kathoden bis 4 Meter Länge
- Automatische Symmetrierung der Kathodenleistungen
- Leistungsquotientenregler für asymmetrische Pulsleistung (bis 10 : 90 %)
- Vollautomatisches Arc-Management (0,3 mJ/kW)
- Automatische Leistungskompensation bis 2000 Arcs / sec
- Prozessreproduzierbarkeit besser als 2 %

- Reactive coating processes for cathodes up to 4 meter length
- Automatic symmetrization of cathode power
- Power ratio controller for asymmetric pulse power (up to 10 : 90 %)
- Fully automatic Arc-Management (0.3 mJ/kW)
- Automatic power compensation up to 2000 Arcs / sec
- Process reproducibility better 2 %



HXB 900 - 1400

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Variations

Type	AC-Output			Order-No.
HXB 900	20 kHz	+ / - 800 V	90 kW	14Z010
HXB 1050	20 kHz	+ / - 800 V	105 kW	14Z020
HXB 1200	20 kHz	+ / - 800 V	120 kW	14Z030
HXB 1400	20 kHz	+ / - 800 V	140 kW	14Z040

Options and Accessories	Order-No.
Connections on top	04Y310
Interface AS 4	01Y001
Interface AS 4 F	01Y021
Profibus Interface	01Y152
Interface RS 232 / 485	01Y181
Pulse Generator Display PD 1	50Y280
Interface ASP for PD 1	01Y005
Remote Control RC 4	06Y401

Mains Controller MC 8

Pulse Generator Display PD 1

Master Display MD 4



Technical Data HXB				
	Medium Frequency / Bipolar Pulse Generator			
	HXB 900	HXB 1050	HXB 1200	HXB 1400
Output Power	90 kW	105 kW	120 kW	140 kW
Output Voltage *	+ / - 800 V	+ / - 800 V	+ / - 800 V	+ / - 800 V
Output Current *	180 A	210 A	240 A	280 A
Control	Current, voltage or power controlled Voltage controlled with ignition automatic			
Modes of Operation	External via A/D interface AS 4, Profibus, RS 232 / 485			
Output Accuracy	+ / - 1 % of nominal value for current, voltage or power			
Power Ratio	10 to 90 % or automatic symmetrization			
Pulse Frequency	20 kHz, fixed			
Arc Suppression	Automatic parameter setting			
Quenching Time	< 2 µs			
Break Time	2 to 20 µS (automatic setting)			
Arc Energy	< 0.3 mJ/kW			
Output Inductance	Max 10 µH			
Mains Connection	3 x 400 V, +/- 10 %, 50/60 Hz, PE (Option: 3 x 440 V or 3 x 480 V)			
Power Consumption	100 kVA	118 kVA	135 kVA	155 kVA
Fusing	3 x 160 A	3 x 200 A	3 x 224 A	3 x 250 A
Cooling	Water 4 – 8 Bar, < 40° C, Forced air, maximum ambient temperature 40° C			
Water Flow	> 15 l/min		> 20 l/min	
Cooling Capability of Water	6 kW	7.4 kW	9 kW	9.8 kW
Cooling Capability of Air	0.9 kW		1.1 kW	
Size	Cabinet, 33 HE, width 600 mm, height 1800 mm, deep 830 mm (without water connection and plug)			
Weight	430 kg		500 kg	
Water Connection	1" female thread			
Drain	10 mm tube			
Compressed Air	4 – 8 Bar, 10 mm tube			
Mains Cable	4 x 50 mm²	4 x 70 mm²	4 x 95 mm²	
Output Cable	3 x JZ-600-Y-CY, 24 x 1.5 mm²		4 x JZ-600-Y-CY 24 x 1.5 mm²	

ADL brings Glass in Architecture to Perfection



Unipolar Pulsgeneratoren SD 30, SD 150 und SD 300

Die Pulsgeneratoren erzeugen in Verbindung mit einer ADL DC-Stromversorgung unipolare Impulse. Die Geräte arbeiten mit einer fest eingestellten Frequenz von 20 kHz. Mit einem externen Signalgenerator kann die Frequenz in einem Bereich von 1 kHz bis 40 kHz variiert werden.

Die Generatoren besitzen eine automatische Arc-Unterdrückung. Die Parameter für Trip-level und Pausenzeiten werden automatisch an den jeweiligen Prozess angepasst. Die übliche Programmierung durch den Benutzer ist nicht erforderlich.

Mehrere Generatoren können über Steuerleitungen für eine Synchronisation verbunden werden. Die Geräte schalten sich dabei automatisch auf externe Synchronisation.

***Highlights

- * Output power 3 kW, 15 kW, 30 kW
- * Parallel operation up to 240 kW
- * Automatic arc handling
- * Air cooling
- * Very compact design
- * Floating output

Unipolar Pulse Generators SD 30, SD 150 and SD 300

In combination with an ADL DC-power supply the pulse generators generate unipolar pulses. The pulse generators work with a fixed frequency of 20 kHz. Thus, with an external signal generator this frequency can be varied from 1 kHz up to 40 kHz. The pulse generators are equipped with an automatic arc suppression. The parameters for Triplevel and Break time are automatically adjusted to the specific processes. Programming by the user is not necessary at all.

For an automatic synchronization several generators can be connected via control cables. In this case the pulse generators automatically switch to external synchronization.



SD 150 rear view



SD 300 rear view

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Variations

Type	Pulse-Output			Order-No.
SD 30	20 kHz	800 V	3 kW	11Z010
SD 150	20 kHz	800 V	15 kW	11Z015
SD 300	20 kHz	800 V	30 kW	11Z035

Options and Accessories	Order-No.
Master Oscillator OM 20	50Y301
SD 30 / SD 150-Connector Set X1 / X6 straight	03Y050
SD 30 / SD 150-Connector Set X1 / X6 angled	03Y070
SD 300-Connector Set X1 / X6 straight	03Y060
SD 300-Connector Set X1 / X6 angled	03Y080



SD 150 open, front view

Technical Data SD 30 / SD 150 / SD 300			
	Unipolar Pulse Generator SD 30	Unipolar Pulse Generator SD 150	Unipolar Pulse Generator SD 300
Input Voltage	Max. 800 V DC		
Output Current	5.3 A	38 A	70 A
Output Power	3 kW (DC-Output of power supply)	15 kW (DC-Output of power supply)	30 kW (DC-Output of power supply)
Pulse Frequency	20 kHz, fixed		
Pulse on Time	48 µS		
Pulse off Time	2 µS		
Principle of Operation	unipolar		
Arc Suppression	Automatic parameter setting		
Input Cable Type JZ-600-Y-CY	2 x 1.5 mm ²	2 x 6 mm ²	2 x 16 mm ²
Output Cable Type JZ-600-Y-CY	2 x 1.5 mm ² (max. 5 m)	2 x 6 mm ² (max. 5 m)	2 x 16 mm ² (max. 5 m)
Maximum Cable Length	5 m (between pulse generator and cathode)		
Output Inductance	max. 10 µH (cable + cathode)		
Indications	Status LEDs		
Auxiliary Voltage	24 V DC + / - 10 %, 1 A		24 V DC + / - 10 %, 1.2 A
Cooling	Air cooled, forced air, maximum ambient temperature 40° C		
Size	167 mm width, 127 mm height, 474 mm deep		218 mm width, 130 mm height, 645 mm deep
Weight	10 kg		18 kg
Compatible with the following Power Supplies:	GS 10 to GS 30 (except all versions over 800 V)	GS 60 to GS 150, GX 50 to GX 150 (except all versions over 800 V or over 38 A)	GSW 100 to GSW 300 HX 150 to HX 300 (except all versions over 800 V or over 70 A)

ADL - Testing Department



Unipolar Pulsgeneratoren mit Gegenspannungsimpuls SD 151, SD 301 und SD 351

Die Pulsgeneratoren erzeugen in Verbindung mit einer ADL DC-Stromversorgung unipolare Impulse mit Gegenspannungsimpulsen (reverse pulse) zur schnelleren Entladung der Kathode. Die extrem schnelle, vollautomatische Arc-Unterdrückung verringert in Verbindung mit dem Gegenspannungsimpuls die Arc-Energie um ca. 50 % gegenüber SD 150 und SD 300. Die Geräte arbeiten mit einer fest eingestellten Frequenz von 20 kHz. Mit einem externen Signalgenerator kann die Frequenz jedoch in einem Bereich von 1 kHz bis 40 kHz variiert werden.

Bis zu acht Generatoren können über Steuerleitungen für eine automatische Synchronisation miteinander verbunden werden. Die neuartige Elektronik im SD 151, SD 301 und SD 351 kompensiert Laufzeitunterschiede, so daß auch bei parallelgeschalteten Hochspannungsausgängen kein Master Oszillator zur exakten Synchronisation notwendig ist.

***Highlights

- * Reverse pulse
- * Reduced arc energy
- * Very fast automatic arc handling
- * Output power 15 kW, 30 kW and 35 kW
- * Automatic synchronization up to 280 kW
- * Very compact design

Unipolar Pulse Generators SD 151, SD 301 and SD 351 with reverse pulse

In combination with an ADL DC-power supply the pulse generators SD 151 / SD 301 and SD 351 generate unipolar pulses with reverse pulses for a much faster discharge of the cathode. The extreme fast, fully automatic arc suppression reduces, in combination with reverse pulses, the arc energy by ~ 50 % – in comparison to a pulse generator without reverse pulse (SD 150 / SD 300).

The generators work with a fixed frequency of 20 kHz. Thus, with an external signal generator this frequency can be varied in an area of 1 kHz up to 40 kHz.

Up to eight pulse generators can be interconnected for an automatic synchronization via control cables. The new electronic of the SD 151, SD 301 and SD 351 compensates delay times, so that even if the high voltage outputs are connected in parallel, no master oscillator is necessary for an exact synchronization.

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Variations

Type	Pulse-Output			Order-No.
SD 151	20 kHz	800 V	15 kW	11Z020
SD 301	20 kHz	800 V	30 kW	11Z040
SD 301/500	20 kHz	500 V	30 kW	11Z047
SD 351	20 kHz	800 V	35 kW	11Z045

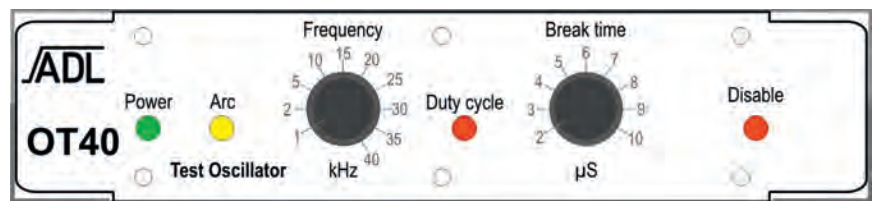
Options and Accessories	Order-No.
Test Oscillator OT 40	50Y401
Master Oscillator OMV	50Y410
Master Oscillator OM 1, OM 2, OM 3	50Y421 50Y422 50Y423
SD 151-Connector Set X1 / X6 straight	03Y050
SD 151-Connector Set X1 / X6 angled	03Y070
SD 301 / SD 351-Connector Set X1 / X6 straight	03Y060
SD 301 / SD 351-Connector Set X1 / X6 angled	03Y080

Test Oscillator OT 40

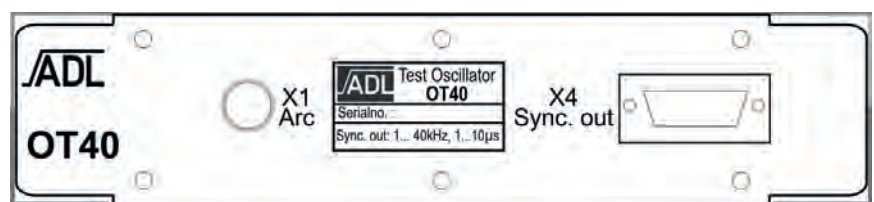
Mit diesem Gerät können die Frequenz und die Pausenzeit unabhängig voneinander eingestellt werden. Während des Testbetriebes einer Anlage lassen sich damit die optimalen Werte für Frequenz und Pausenzeiten ermitteln.

With the OT 40 the frequency and the pulse off time can be set independently from each other. The perfect values for frequency and pulse off time can be determined during a test operation.

Front view OT 40



Rear view OT 40



Master Oscillator OMV

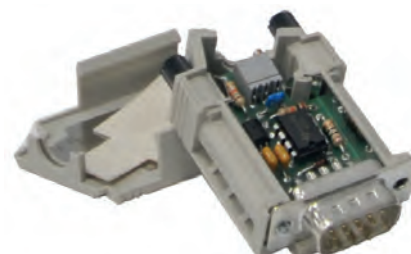
Der Oszillator OMV überträgt die festeingestellten Werte für Frequenz und Pausenzeit an den Pulsgenerator. Wenn die optimalen Einstellungen des Pulsgenerators bekannt sind oder zuvor mit dem Test-Oszillator OT 40 ermittelt wurden, kann der OMV mit den gewünschten Festeinstellungen bestellt werden. Ein versehentliches Verstellen der Parameter durch das Bedienpersonal ist damit ausgeschlossen.

The oscillator OMV transmits the preset values for frequency and pulse off time to the pulse generator. If the customer knows the ideal settings for the pulse generators or if the customer has determined the ideal settings via Test-Oscillator OT 40, then the OMV can already be ordered with the desired fixed settings. An unintended alteration of the parameters through operators is therefore not possible.

Oscillators OM 1, OM 2, OM 3

Mit diesen einfachen Oszillatoren kann nur die Frequenz in den Einstellbereichen 1 - 4 kHz, 6 - 20 kHz und 12 - 40 kHz verändert werden. Die Pausenzeit bleibt unabhängig von der Frequenzeinstellung bei 2 μs.

With these simple oscillators only the frequency can be changed within the setting ranges 1 - 4 kHz, 6 - 20 kHz und 12 - 40 kHz. The pulse off time remains unaffected with 2 μs.



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Technical Data SD 151 / SD 301 / SD 351				
	Unipolar Pulse Generators			
	SD 151	SD 301	SD 301/500	SD 351
Input Voltage	Max. 800 V DC		Max. 500 V DC	Max. 800 V DC
Output Current	38 A	70 A	80 A	70 A
Output Power	15 kW (DC-Output of power supply)	30 kW (DC-Output power of power supply)		35 kW (DC-Output power of power supply)
Pulse Frequency	20 kHz, fixed (externally adjustable from 1 kHz up to 40 kHz)			
Pulse off Time	2 μS fixed			2 μS (externally adjustable from 2 to 10 μS, depending on frequency)
Principle of Operation	Unipolar with reverse voltage impulse			
Arc Suppression	Automatic parameter setting			
Quenching Time	< 2 μS			
Break Time	2 to 20 μS (automatic setting)			
Arc Energy	0.3 mJ/kW at an output inductance of 3 μH			
Input Cable Type JZ-600-Y-CY	2 x 6 mm²	2 x 16 mm²	2 x 25 mm²	2 x 16 mm²
Output Cable Type JZ-600-Y-CY	2 x 6 mm²	2 x 16 mm²	2 x 25 mm²	2 x 16 mm²
Maximum Cable Length	5 m (between pulse generator and cathode)			
Output Inductance	max. 10 μH (cable + cathode)			
Indications	Status LEDs			
Auxiliary Voltage	24 V DC + / - 10 %, 1 A	24 V DC + / - 10 %, 1.2 A		
Cooling	Forced air, maximum ambient temperature 40° C			
Size	167 mm width, 127 mm height, 474 mm deep (without plug)	Width 218 mm, height 130 mm, deep 645 mm (without plug)		
Weight	10 kg	18 kg		
Compatible with the following Power Supplies:	GX 50 - GX 150 (except all versions over 800 V or over 38 A)	HX 150 - HX 300 (except all versions over 800 V or 70 A)	HX 150 - HX 300 (except all versions over 500 V)	HX 150 - HX 350 (except all versions over 800 V or 70 A)
	Only with interface X4P for pulse generators			

Unipolar Pulsgenerator HXD 901 - 1401

Unipolar Pulse Generator HXD 901 - 1401

High power, easy handling and very smooth operating!

- Reaktive Beschichtungsprozesse für Kathoden bis 4 Meter Länge
 - Stabile Prozesse bei Arc-kritischen Targets
 - Vollautomatisches Arc-Management (0,3mJ/kW)
 - Automatische Leistungskompensation bis 2000 Arcs / sec
 - Schnelle Entladung mit Gegenspannungsimpuls
-
- Reactive coating processes for cathodes up to 4 meter length
 - Stable processing with arc-critical targets
 - Fully automatic arc management (0.3 mJ/kW)
 - Automatic power compensation up to 2000 Arcs / sec
 - Fast discharge with reverse pulse



HXD 1401

Variations

Type	Pulse-Output			Order-No.
HXD 901	20 kHz	800 V	90 kW	14Z210
HXD 1051	20 kHz	800 V	105 kW	14Z220
HXD 1201	20 kHz	800 V	120 kW	14Z230
HXD 1401	20 kHz	800 V	140 kW	14Z240

Options and Accessories	Order-No.
Connections on top	04Y310
Interface AS 4	01Y001
Interface AS 4 F	01Y021
Profibus Interface	01Y152
Interface RS 232 / 485	01Y181
Remote Control RC 4	06Y401

Mains Controller MC 8

Master Display MD 4

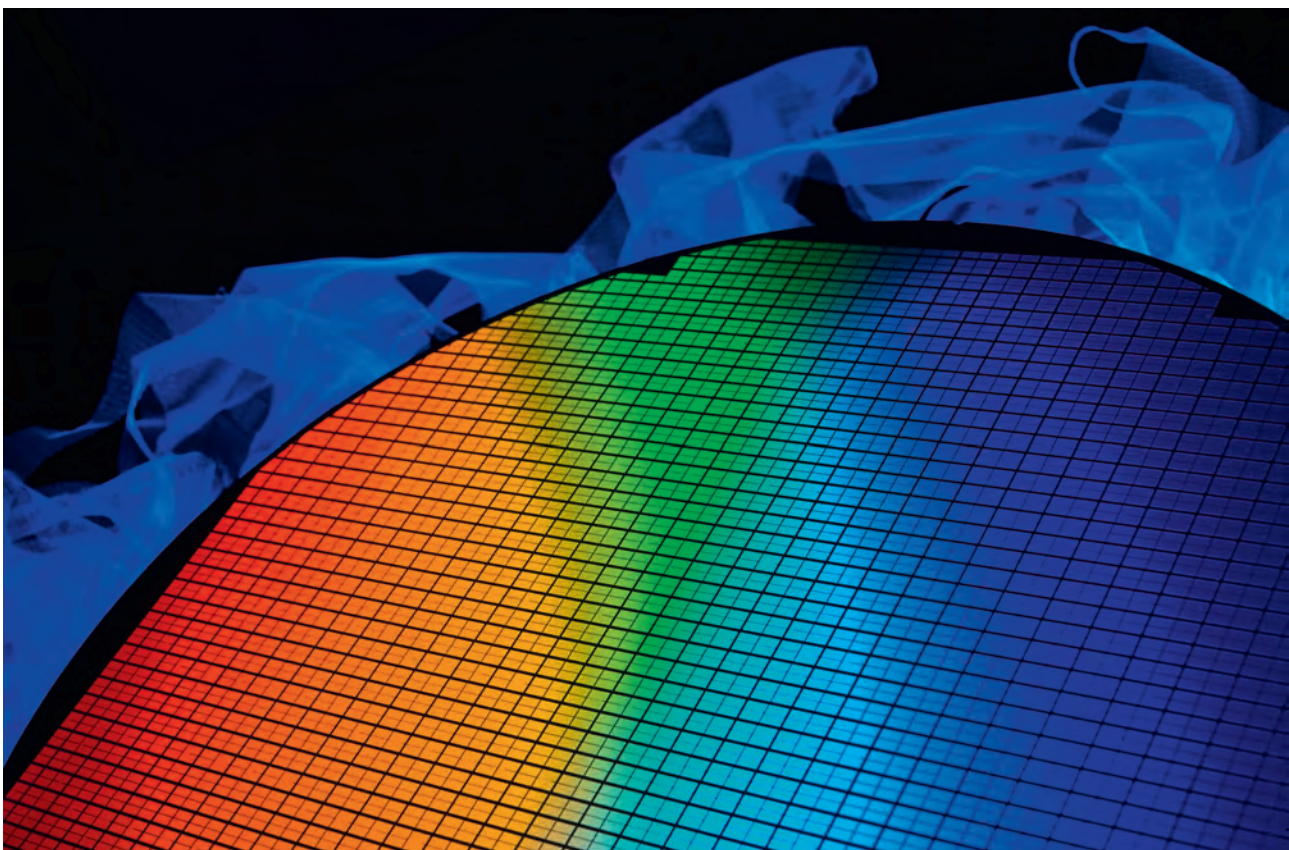
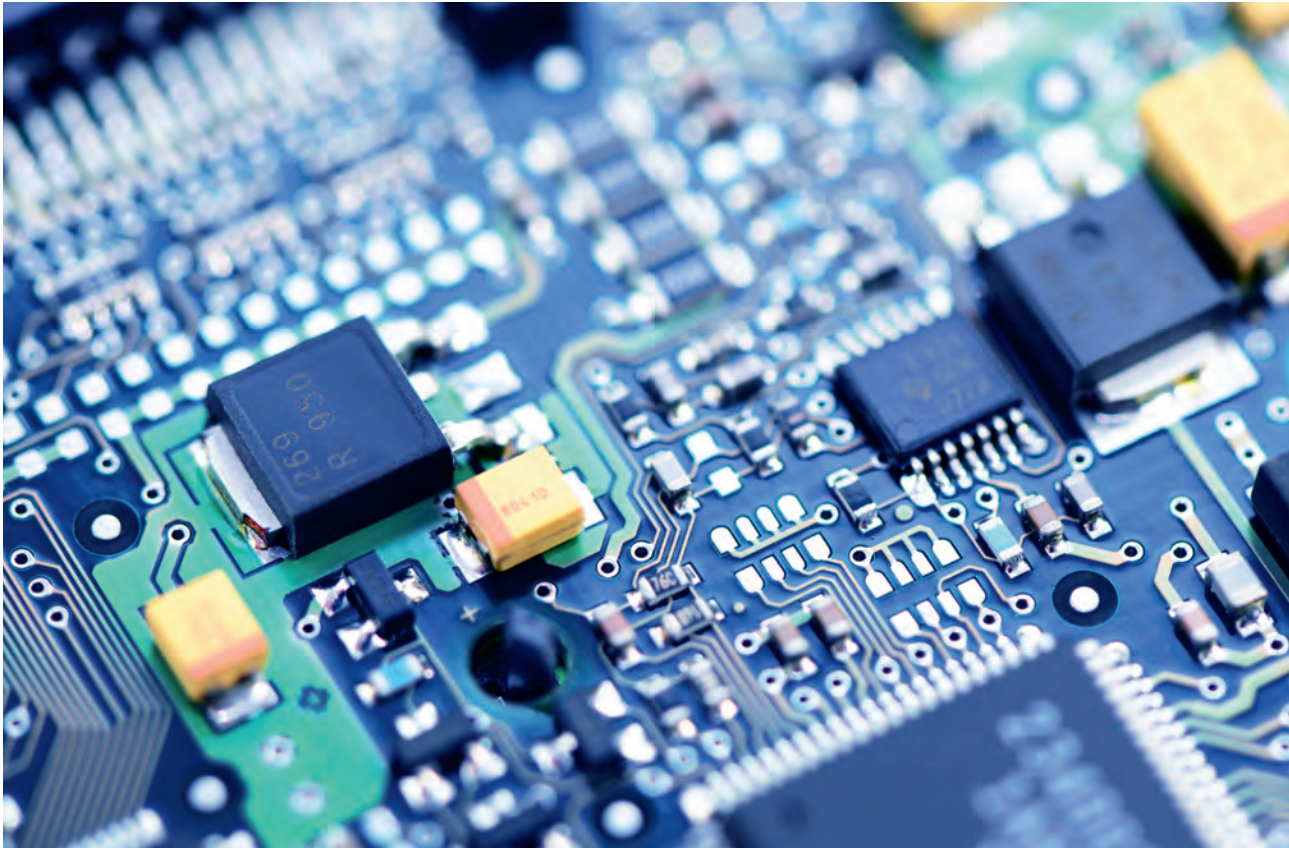


Technical Data HXD

	Unipolar Pulse Generators			
	HXD 901	HXD 1051	HXD 1201	HXD 1401
Output Power	90 kW	105 kW	120 kW	140 kW
Output Voltage *	800 V	800 V	800 V	800 V
Output Current *	180 A	210 A	240 A	280 A
Control	Current, voltage or power controlled or voltage controlled with ignition automatic			
Modes of Operation	External via A/D interface AS 4, Profibus, RS 232 / 485			
Output Accuracy	+ / - 1 % of nominal value for current, voltage or power			
Pulse Frequency	20 kHz, fixed, externally adjustable from 1 kHz up to 40 kHz			
Pulse off Time	2 µS, externally adjustable from 2 µS up to 10 µS (depending on frequency)			
Principle of Operation	Unipolar with reverse voltage impulse			
Arc Suppression	Automatic parameter setting			
Quenching Time	< 2 µs			
Break Time	2 to 20 µS (automatic setting)			
Arc Energy	< 0.3 mJ/kW			
Output Inductance	Max 10 µH			
Mains Connection	3 x 400 V, +/- 10 %, 50/60 Hz, PE (Option: 3 x 440 V or 3 x 480 V)			
Power Consumption	100 kVA	118 kVA	135 kVA	155 kVA
Fusing	3 x 160 A	3 x 200 A	3 x 224 A	3 x 250 A
Cooling	Water 4 – 8 Bar, < 40° C, Forced air, maximum ambient temperature 40° C			
Water flow	> 15 l/min		> 20 l/min	
Cooling Capability of Water	4 kW	5 kW	5.5 kW	6.5 kW
Cooling Capability of Air	1.2 kW		1.6 kW	
Size	Cabinet, 33 HE Width 600 mm, height 1800 mm, deep 830 mm (without water connection and plug)			
Weight	430 kg		500 kg	
Water Connection	1" female thread			
Drain	10 mm tube			
Compressed Air	4 – 8 Bar, 10 mm tube			
Mains Cable	4 x 50 mm²	4 x 70 mm²	4 x 95 mm²	
Output Cable	3 x JZ-600-Y-CY, 2 x 16 mm²		4 x JZ-600-Y-CY 2 x 16 mm²	

* Other voltage and current ranges on request

ADL - Analogue and Digital Power Electronics



DC-Stromversorgungen GS 05 - GS 30

Die kompakten Geräte sind für kleinere Magnetrons in Produktions- und Laboranlagen entwickelt worden. Durch die einfache und sichere Bedienbarkeit können die Stromversorgungen sehr flexibel eingesetzt werden. Das Arc-Handling paßt sich unterschiedlichen Prozeßparametern automatisch an, so daß kein Programmieraufwand notwendig ist. Die Geräte sind für den Einbau in 19"-Baugruppenträger konzipiert.



Active front panel

***Highlights

- * Output power 0.5 - 3.0 kW
- * Air cooling
- * 1/2 19"-case, 3 HU
- * Interchangeable interfaces
- * Display for voltage, current and power
- * Manual operation via front panel
- * Automatic arc handling



Passive front panel

DC-Power Supplies GS 05 - GS 30

The compact power supplies were developed for small magnetrons in production plants and laboratories. Easy and safe operation make these power supplies very flexible for many processes. The arc handling adjusts automatically to different process parameters, so that programming is not necessary. The units are designed for the mounting in 19"-racks.



Rear view / Coaxial HV-Connector

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Variations

Type	DC-Output			Order-No.
GS 05/800	0.5 kW	800 V	0.9 A	03Z040
GS 10/800	1.0 kW	800 V	1.7 A	03Z090
GS 15/800	1.5 kW	800 V	3 A	03Z140
GS 20/800	2.0 kW	800 V	3.5 A	03Z190
GS 30/800	3.0 kW	800 V	5.3 A	03Z240
GS 05/1000	0.5 kW	1000 V	0.7 A	03Z050
GS 10/1000	1.0 kW	1000 V	1.4 A	03Z092
GS 15/1000	1.5 kW	1000 V	2.4 A	03Z150
GS 20/1000	2.0 kW	1000 V	2.8 A	03Z200
GS 30/1000	3.0 kW	1000 V	4.2 A	03Z250
GS 12/2000	1.2 kW	2000 V	1 A	03Z110

Options and Accessories	Order-No.
Interface AS 4	01Y001
Profibus	01Y152
Interface RS 232 / 485	01Y181
Front panel active with 3 ½ Digit Display	02Y020
Front panel passive with 3 ½ Digit Display	02Y021
Line Voltage 3 x 200 V *	10Y015
Output Voltage floating **	10Y020
19" Mounting Frame for 2 Units	02Y030

* Only GS 15 and GS 20

** Only GS 15, GS 20 and GS 30

Technical Data GS 05 – GS 30					
	GS 05/800	GS 10/800	GS 15/800	GS 20/800	GS 30/800
Output Power	0.5 kW	1 kW	1.5 kW	2 kW	3 kW
Output Voltage	800 V Plus pole grounded				
	Option: Minus pole grounded		Option: Floating		
Output Current	0.9 A	1.7 A	3 A	3.5 A	5.3 A
Control	Current, voltage or power controlled				
Modes of Operation	Manual via front panel or external via A/D interface AS 4, AS 4 F, Profibus or RS 232 / 485				
Set Point	0 ... 100 % of nominal voltage, current or power				
Output Accuracy	+/- 1 % of nominal value for voltage, current and power				
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically				
Indications	3 ½ digit display for voltage, current and power				
Noise Emission	$L_{pA} < 70 \text{ dB (A)}$				
Mains Connection	230 V, + / -10 %, 50/60 Hz, (Option: 200 V, L1, L2, PE)		3 x 400 V, + / -10 %, 50/60 Hz, (Option: 3 x 200 V, only GS 15 and GS 20), PE		
Power Consumption	0.6 kVA	1.2 kVA	1.8 kVA	2.4 kVA	3.6 kVA
Fusing	6 A	6 A	6 A (10 A)	6 A (10 A)	10 A
Output Cable Type RG 213 or JZ-600-Y-CY	2 x 1.5 mm ²				
Cooling	Forced air, maximum ambient temperature 40° C				
Size	½ 19" slide-in, 3 HU (132.5 mm), 560 mm deep				
Weight	11 kg		12 kg		

Technical Data GS 05 – GS 30

	GS 05/1000	GS 10/1000	GS 12/2000	GS 15/1000	GS 20/1000	GS 30/1000
Output Power	0.5 kW	1 kW	1.2 kW	1.5 kW	2 kW	3 kW
Output Voltage	1000 V		2000 V	1000 V		
	Plus pole grounded					
	Option: Minus pole grounded			Option: Floating		
Output Current	0.7 A	1.4 A	1 A	2.4 A	2.8 A	4.2 A
Control	Current, voltage or power controlled					
Modes of Operation	Manual via front panel or external via A/D interface AS 4, AS 4 F, Profibus or RS 232 / 485					
Set Point	0 ... 100 % of nominal voltage, current or power					
Output Accuracy	+/- 1 % of nominal value for voltage, current and power					
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically					
Indications	3 ½ digit display for voltage, current and power					
Noise Emission	L _{pA} < 70 dB (A)					
Mains Connection	230 V, + / -10 %, 50/60 Hz, (Option: 200 V, L1, L2, PE)			3 x 400 V, + / -10 %, 50/60 Hz, (Option: 3 x 200 V, only GS 15 and GS 20), PE		
Power Consumption	0.6 kVA	1.2 kVA	1.4 kVA	1.8 kVA	2.4 kVA	3.6 kVA
Fusing	6 A	6 A	10 A	6 A (10 A)	6 A (10 A)	10 A
Output Cable Type RG 213 or JZ-600-Y-CY	2 x 1.5 mm ²					
Cooling	Forced air, maximum ambient temperature 40° C					
Size	½ 19" slide-in, 3 HU (132.5 mm), 560 mm deep					
Weight	11 kg			12 kg		

DC-Stromversorgungen GS 60 - GS 150

Die luftgekühlten DC-Stromversorgungen der Serie GS 60 – GS 150 gibt es in drei Varianten: mit aktivem Frontpanel, mit passivem Frontpanel und mit Status-LEDs. Die Stromversorgungen können mit voller Nennleistung ohne Einschränkung der Einschaltdauer betrieben werden. Der Parallelbetrieb mehrerer Geräte ist möglich. Die Serie GS 60 – GS 150 verfügt, wie alle Stromversorgungen von ADL, über eine extrem schnelle, automatische Arc-Löschung. Die Bedienung der Geräte ist sehr einfach und sicher.



Active front panel

***Highlights

- * Output power 6.0 - 15 kW
- * Air cooling
- * 19"-case, 3 HU
- * Floating output
- * Joule mode (Option)
- * Automatic arc handling



Rear view

DC-Power Supplies GS 60 - GS 150

The air cooled DC power supplies, series GS 60 – GS 150, are available in three different versions: with active front panel, with passive front panel and with status-LEDs. The power supplies can be operated with full nominal power without limitation of the duty cycle. Parallel operation of several power supplies is possible. The series GS 60 – GS 150 has, like all power supplies from ADL, an extreme fast, automatic arc handling. The operation of the power supplies is easy and safe.



Front panel with Status-LEDs

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Variations

Type	DC-Output			Order-No.
GS 60/800	6 kW	800 V	10 A	03Z290
GS 80/800	8 kW	800 V	17 A	03Z340
GS 100/800	10 kW	800 V	17 A	03Z390
GS 120/800	12 kW	800 V	20 A	03Z440
GS 150/800	15 kW	800 V	25 A	03Z490

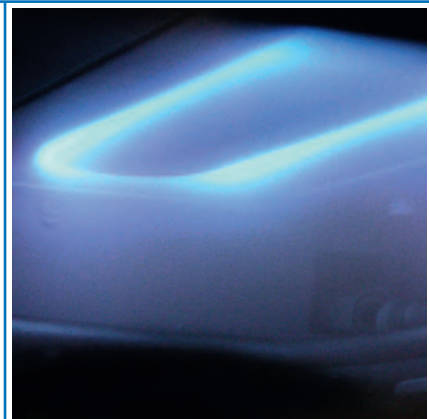
Options and Accessories	Order-No.
Interface AS 4	01Y001
Profibus	01Y152
Interface RS 232 / 485	01Y181
Front panel active with 3 ½ Digit Display	02Y050
Front panel passive with 3 ½ Digit Display	02Y101
Status-LEDs	01Y010
Joule Mode *	01Y041
Second Voltage Range U1/U2 **	10Y010
Plasma Control **	50Y051
Connector Set X1 / X2 GS / GSC straight	03Y020
Connector Set X1 / X2 GS / GSC angled	03Y040

* Only with Profibus

** Only with active front panel

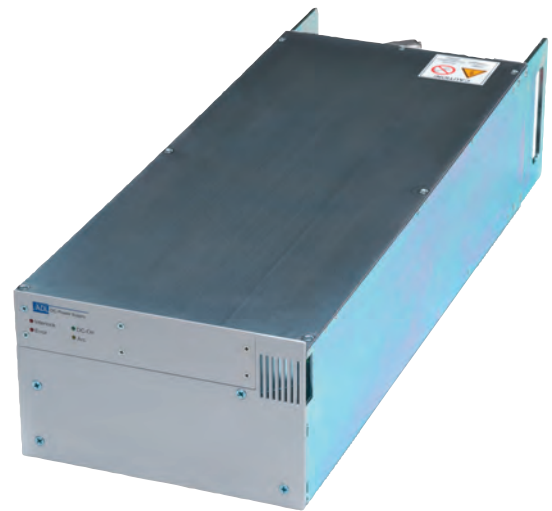
Technical Data GS 60 – GS 150					
	GS 60/800	GS 80/800	GS 100/800	GS 120/800	GS 150/800
Output Power	6 kW	8 kW	10 kW	12 kW	15 kW
Output Voltage	800 V				
Output Current	10 A	17 A	20 A	25 A	
Control	Current, voltage or power controlled				
Modes of Operation	Manual via front panel or external via A/D interface AS 4, AS 4 F, Profibus or RS 232 / 485				
Set Point	0 ... 100 % of nominal current, voltage or power				
Output Accuracy	+/- 1 % of nominal value for current, voltage and power				
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically				
Indication	3½-digit display for current, voltage and power				
Noise Emission	$L_{pA} < 70$ dB (A)				
Mains Connection	3 x 400 V, + / -10 %, 50/60 Hz, PE				
Power Consumption	6.6 kVA	9 kVA	11 kVA	13.2 kVA	16.5 kVA
Fusing	16 A	20 A	25 A		
Cooling	Forced air, maximum ambient temperature 40° C				
Size	19", 3 HU (132.5 mm) 570 mm deep (without plug)				
Weight	27 kg	29 kg			31 kg
Mains Cable	4 x 1.5 mm ²	4 x 2.5 mm ²	4 x 4 mm ²		
Output Cable Type JZ-600-Y-CY	2 x 1.5 mm ²	2 x 2.5 mm ²	2 x 4 mm ²		

ADL - R & D, Production, Education, Assistance - Specialist in Sputter Technology



DC-Stromversorgungen GX 50 – GX 150

GX-Sputterstromversorgungen sind in der Lage, bis zu 80.000 Arcs pro Sekunde automatisch zu löschen. Die extreme Leistungsfähigkeit, kombiniert mit kleinen Abmessungen, sind herausragende Kennzeichen der Serie GX. Die Geräte können mit voller Nennleistung ohne Einschränkung der Einschaltdauer betrieben und auch parallel geschaltet werden.



GX with Status-LEDs

***Highlights

- * Output power 5 - 15 kW
- * Water cooling
- * 1/2 19"-case, 3 HU
- * Floating output
- * Joule mode (Option)
- * Automatic arc handling



GX open

DC-Power Supplies GX 50 – GX 150

GX-Sputtering Power Supplies are able to eliminate up to 80.000 arcs per second automatically. This extreme capability combined with the small size of the power supply is outstanding and significant for the series GX. The power supplies can be operated with full nominal power without limitation of the operation time and they can also be switched in parallel.

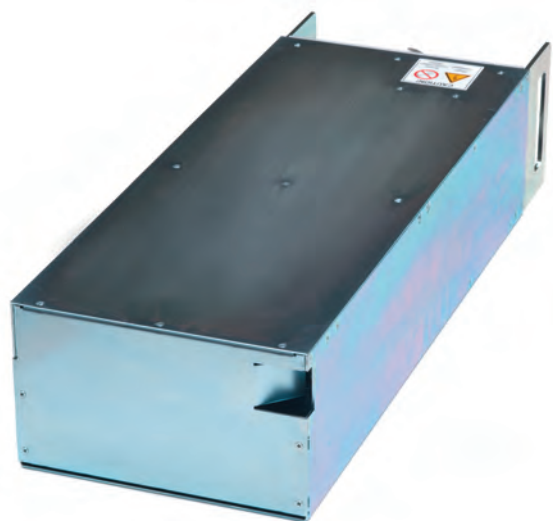


GX rear view

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Variations

Type	DC-Output			Order-No.
GX 50/250	5 kW	250 V	50 A	07Z010
GX 50/800	5 kW	800 V	14 A	07Z005
GX 50/1000	5 kW	1000 V	10 A	07Z015
GX 60/800	6 kW	800 V	15 A	07Z040
GX 60/1000	6 kW	1000 V	12 A	07Z045
GX 80/800	8 kW	800 V	20 A	07Z090
GX 80/1000	8 kW	1000 V	16 A	07Z099
GX 100/400	10 kW	400 V	38 A	07Z141
GX 100/600	10 kW	600 V	30 A	07Z142
GX 100/800	10 kW	800 V	25 A	07Z140
GX 100/1000	10 kW	1000 V	20 A	07Z149
GX 120/200	12 kW	200 V	60 A	07Z151
GX 120/800	12 kW	800 V	30 A	07Z190
GX 150/800	15 kW	800 V	38 A	07Z240
GX 150/1000	15 kW	1000 V	30 A	07Z249



GX blind case



Duo-GX open, front view

Options and Accessories	Order-No.
Interface AS 4	01Y001
Interface AS 6	01Y061
Profibus Interface	01Y152
Interface RS 232 / 485	01Y181
Arc-link	10Y100
GX-Status-LEDs	01Y071
GX-Display	01Y081
Bias Voltage Control	10Y040
Swagelok-Water Couplings straight	04Y020
Swagelok-Water Couplings angled	04Y040
SMC Water Connectors	04Y100
GX-Connector Set X1 / X2 straight	03Y220
GX-Connector Set X1 / X2 angled	03Y240
19" Mounting Angle	01Y095
19" Mounting Set Duo-GX	03Y091
19" Mounting Set Single-GX	03Y093
Magnetic Valve Control with 24 V DC-Output	04Y035
Magnetic Valve with 24 V DC with connecting Cable	04Y030
Remote Control RC 4	06Y401



Harting plugs and



Swagelok water couplings straight

Technical Data GX 50 - 150					
	GX 50/250	GX 50/800	GX 50/1000	GX 60/800	GX 60/1000
Output Power	5 kW	5 kW	5 kW	6 kW	6 kW
Output Voltage	250 V	800 V	1000 V	800 V	1000 V
Output Current	50 A	14 A	10 A	15 A	12 A
Control	Current, voltage or power controlled				
Modes of Operation	External via A/D interface AS 4, AS 4 F, AS 6, Profibus or RS 232 / 485				
Set Point	0 ... 100 % of nominal current, voltage or power				
Output Accuracy	+ / - 1 % of nominal value for current, voltage and power				
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically				
Indications	3 ½ digit display for current, voltage and power (Option)				
Noise Emission	$L_{pA} < 70$ dB (A)				
Mains Connection	3 x 400 V, +/-10 %, 50 / 60 Hz (Option: 3 x 440 V or 3 x 480 V)				
Power Consumption	6 kVA	6 kVA	6 kVA	6.6 kVA	6.6 kVA
Fusing	3 x 16 A				
Cooling	Water, > 1.5 l / min, 2 to 8 Bar, < 40° C Forced air, maximum ambient temperature 40° C				
Water Connection	Swagelok B-QC6 ...				
Cooling Capability of Water	300 W				
Cooling Capability of Air	45 W				
Size	½ 19", 3 HU (130 mm) x 520 mm deep (without plug), 590 mm deep (with plug)				
Weight	21 kg				
Mains Cable	4 x 1.5 mm ²				
Output Cable Type JZ-600-Y-CY	2 x 10 mm ²	2 x 1.5 mm ²	2 x 1.5 mm ²	2 x 1.5 mm ²	2 x 1.5 mm ²
Mains Connection (X2)	Harting Han-Modular Compact				
DC-Connection (X1)	Harting Han-Modular Compact				

Technical Data GX 50 - 150

	GX 80/800	GX 80/1000	GX 100/400	GX 100/600	GX 100/800
Output Power	8 kW	8 kW	10 kW	10 kW	10 kW
Output Voltage	800 V	1000 V	400 V	600 V	800 V
Output Current	20 A	16 A	38 A	30 A	25 A
Control	Current, voltage or power controlled or voltage controlled with ignition automatic				
Modes of Operation	External via A/D interface AS 4, AS 4 F, AS 6, Profibus or RS 232 / 485				
Set Point	0 ... 100 % of nominal current, voltage or power				
Output Accuracy	+ / - 1 % of nominal value for current, voltage and power				
Arc Suppression	Quenching time: 6 µs up 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically				
Indications	3 ½ digit display for current, voltage and power (Option)				
Noise Emission	$L_{pA} < 70$ dB (A)				
Mains Connection	3 x 400 V, + / - 10 %, 50 / 60 Hz (Option: 3 x 440 V or 3 x 480 V)				
Power Consumption	9 kVA	9 kVA	11 kVA	11 kVA	11 kVA
Fusing	3 x 20 A				
Cooling	Water, > 1.5 l / min, 2 to 8 Bar, < 40° C Forced air, maximum ambient temperature 40° C				
Water Connection	Swagelok B-QC6 ...				
Cooling Capability of Water	400 W	400 W	500 W	500 W	500 W
Cooling Capability of Air	50 W				
Size	½ 19", 3 HU (130 mm) x 520 mm deep (without plug), 590 mm deep (with plug)				
Weight	23 kg				
Mains Cable	4 x 2.5mm ²				
Output Cable Type JZ-600-Y-CY	2 x 2.5 mm ²	2 x 2.5 mm ²	2 x 6 mm ²	2 x 6 mm ²	2 x 4 mm ²
Mains Connection (X2)	Harting Han-Modular Compact				
DC-Connection (X1)	Harting Han-Modular Compact				

Technical Data GX 50 - 150					
	GX 100/1000	GX 120/200	GX 120/800	GX 150/800	GX 150/1000
Output Power	10 kW	12 kW	12 kW	15 kW	15 kW
Output Voltage	1000 V	200 V	800 V	800 V	1000 V
Output Current	20 A	60 A	30 A	38 A	30 A
Control	Current, voltage or power controlled or voltage controlled with ignition automatic				
Modes of Operation	External via A/D interface AS 4, AS 4 F, AS 6, Profibus or RS 232 / 485				
Set Point	0 ... 100 % of nominal current, voltage or power				
Output Accuracy	+ / - 1 % of nominal value for current, voltage and power				
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically				
Indications	3 ½ digit display for current, voltage and power (Option)				
Noise Emission	$L_{pA} < 70$ dB (A)				
Mains Connection	3 x 400 V, + / -10 %, 50 / 60 Hz (Option: 3 x 440 V or 3 x 480 V)				
Power Consumption	11 kVA	13.2 kVA	13.2 kVA	16.5 kVA	16.5 kVA
Fusing	3 x 20 A	3 x 25 A	3 x 25 A	3 x 25 A	3 x 25 A
Cooling	Water, > 1,5 l / min, 2 to 8 Bar, < 40° C Forced air, maximum ambient temperature 40° C				
Water Connection	Swagelok B-QC6 ...				
Cooling Capability of Water	500 W	600 W	600 W	750 W	750 W
Cooling Capability of Air	50 W	60 W	60 W	60 W	60 W
Size	½ 19", 3 HU (130 mm) x 520 mm deep (without plug), 590 mm deep (with plug)				
Weight	23 kg	23 kg	23 kg	25 kg	25 kg
Mains Cable	4 x 4 mm ²				
Output Cable Type JZ-600-Y-CY	2 x 4 mm ²	2 x 16 mm ²	2 x 6 mm ²	2 x 6 mm ²	2 x 6 mm ²
Mains Connection (X2)	Harting Han-Modular Compact				
DC-Connection (X1)	Harting Han-Modular Compact				

DC-Stromversorgungen GSW 100 – GSW 300

Die Ausgangsleistung kann im Parallelbetrieb bis auf 240 kW gesteigert werden. Mit einem speziellen Schaltungskonzept kann auf eine "Master-Slave-Verdrahtung" verzichtet werden. Eine leistungsfähige Wasserkühlung sorgt auch in nicht klimatisierten Räumen für höchste Zuverlässigkeit. Die Geräte können manuell über ein aktives Frontpanel oder über eine Schnittstelle betrieben werden. Es stehen verschiedene Frontpanels und Schnittstellenmodule zur Verfügung. Das extrem schnelle Arc-Handling arbeitet vollautomatisch.

***Highlights

- * Output power 10 – 30 kW
- * Water cooling
- * Magnetic valve control (Option)
- * 19"-case, 3 HU
- * Floating output
- * Parallel operation up to 240 kW
- * Automatic arc handling

DC-Power Supplies GSW 100 - GSW 300

In parallel operation the output power can be increased up to 240 kW. Thanks to a special circuit design a "Master-Slave-Wiring" is not necessary. An efficient water cooling guarantees even in non-air conditioned rooms highest reliability. The power supplies can be operated manually via front panel or via interface. There are different front panels and interfaces available. The super fast arc handling works completely automatically.



GSW with active front panel



GSW rear



GSW open

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Variations

Type	DC-Output			Order-No.
GSW 100/500	10 kW	500 V	40 A	06Z010
GSW 100/800	10 kW	800 V	20 A	06Z040
GSW 100/1000	10 kW	1000 V	18 A	06Z041
GSW 150/400	15 kW	400 V	80 A	06Z055
GSW 150/500	15 kW	500 V	60 A	06Z060
GSW 150/600	15 kW	600 V	50 A	06Z070
GSW 150/750	15 kW	750 V	38 A	06Z080
GSW 150/800	15 kW	800 V	30 A	06Z090
GSW 150/1000	15 kW	1000 V	25 A	06Z100
GSW 200/500	20 kW	500 V	70 A	06Z120
GSW 200/750	20 kW	750 V	50 A	06Z135
GSW 200/800	20 kW	800 V	40 A	06Z140
GSW 200/900	20 kW	900 V	40 A	06Z145
GSW 200/1000	20 kW	1000 V	35 A	06Z150
GSW 250/750	25 kW	750 V	60 A	06Z180
GSW 250/800	25 kW	800 V	50 A	06Z190
GSW 250/900	25 kW	900 V	50 A	06Z195
GSW 250/1000	25 kW	1000 V	45 A	06Z200
GSW 300/500	30 kW	500 V	70 A	06Z220
GSW 300/750	30 kW	750 V	66 A	06Z230
GSW 300/800	30 kW	800 V	60 A	06Z240
GSW 300/1000	30 kW	1000 V	50 A	06Z260



Luftleitgehäuse mit Partikelabscheider für den Betrieb in staubiger Umgebung

Air baffle with particle separator for the operation in dusty environment



Options and Accessories	Order-No.
Interface AS 4	01Y001
Interface AS 6 (only with passive Front panel)	01Y061
Profibus Interface	01Y152
Interface RS 232 / 485	01Y181
Arc link	10Y100
Front panel active with 3 ½ Digit Display	02Y050
Front panel passive with 3 ½ Digit Display	02Y101
Status-LEDs	01Y010
Plasma Control (only with active Front panel)	50Y051
Second Voltage Range U1/U2 (only with active Front panel)	10Y010
GSW-Swagelok-Water Couplings straight	04Y020
GSW-Swagelok-Water Couplings angled	04Y040
Cathode Clamp Diode	50Y001
GSW-Connector Set X1 / X2 straight	03Y120
GSW-Connector Set X1 / X2 angled	03Y140
GSW-Air Baffle, 3 Pieces	05Y050
GSW-Mounting Hood with Crane Eye	05Y101
Mains Voltage 3 x 440 V	10Y025
Mains Voltage 3 x 480 V	10Y030
Magnetic Valve 24 V DC with Connector Cable (2m)	04Y030
Magnetic Valve Control with 24 V DC-Output	04Y025



Cathode Clamp Diode



Harting plug straight



Magnetic valve

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Technical Data GSW 100 – GSW 300

	GSW 100/500	GSW 100/800	GSW 100/1000	GSW 150/400	GSW 150/500	GSW 150/600
Output Power	10 kW	10 kW	10 kW	15 kW	15 kW	15 kW
Output Voltage	500 V	800 V	1000 V	400 V	500 V	600 V
Output Current	40 A	20 A	18 A	80 A	60 A	50 A
Control	Current, voltage or power controlled					
Modes of Operation	Manual via front panel or external via A/D interface AS 4, AS 6 *, AS 4 F, Profibus or RS 232 / 485					
Set Point	0 ... 100 % of nominal current, voltage or power					
Output Accuracy	+ / - 1 % of nominal value for current, voltage and power					
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically					
Indications	3 ½ digit display for current, voltage and power (Option)					
Noise Emission	$L_{pA} < 70$ dB (A)					
Mains Connection	3 x 400 V, + / -10 %, 50/60 Hz, PE (Option: 3 x 440 V or 3 x 480 V)					
Power Consumption	11 kVA	11 kVA	11 kVA	16.5 kVA	16.5 kVA	16.5 kVA
Fusing	3 x 20 A	3 x 20 A	3 x 20 A	3 x 25 A	3 x 25 A	3 x 25 A
Cooling	Water, > 3 l / min, 2 to 8 Bar, < 40° C Forced air, maximum ambient temperature 40° C					
Water Connection	Swagelok B-QC6 ...					
Cooling Capability of Water	500 W	500 W	500 W	680 W	680 W	680 W
Cooling Capability of Air	80 W					
Size	19", 3HU x 700 mm deep (without plug)					
Weight	42 kg	42 kg	42 kg	44 kg	44 kg	44 kg
Mains Cable	4 x 2.5 mm ²	4 x 2.5 mm ²	4 x 2.5 mm ²	4 x 4 mm ²	4 x 4 mm ²	4 x 4 mm ²
Output Cable Type JZ-600-Y-CY	2 x 10 mm ²	2 x 2.5 mm ²	2 x 2.5 mm ²	2 x 25 mm ²	2 x 16 mm ²	2 x 10 mm ²
Mains Connection (X2)		Harting Han k4/0				
DC-Connection (X1)		Harting Han 2 MOD				

* Only with passive front panel

Technical Data GSW 100 – GSW 300					
	GSW 150/750	GSW 150/800	GSW 150/1000	GSW 200/500	GSW 200/750
Output Power	15 kW	15 kW	15 kW	20 kW	20 kW
Output Voltage	750 V	800 V	1000 V	500 V	750 V
Output Current	38 A	30 A	25 A	70 A	50 A
Control	Current, voltage or power controlled				
Modes of Operation	Manual via front panel or external via A/D interface AS 4, AS 6 *, AS 4 F, Profibus or RS 232 / 485				
Set Point	0 ... 100 % of nominal current, voltage or power				
Output Accuracy	+ / - 1 % of nominal value for current, voltage and power				
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically				
Indications	3 ½ digit display for current, voltage and power (Option)				
Noise Emission	$L_{pA} < 70$ dB (A)				
Mains Connection	3 x 400 V, + / -10 %, 50/60 Hz, PE (Option: 3 x 440 V or 3 x 480 V)				
Power Consumption	16.5 kVA	16.5 kVA	16.5 kVA	22 kVA	22 kVA
Fusing	3 x 25 A	3 x 25 A	3 x 25 A	3 x 40 A	3 x 40 A
Cooling	Water, > 3 l/min, 2 to 8 Bar, < 40° C Forced air, maximum ambient temperature 40° C				
Water Connection	Swagelok B-QC6 ...				
Cooling Capability of Water	680 W	680 W	680 W	950 W	900 W
Cooling Capability of Air	80 W	80 W	80 W	150 W	100 W
Size	19", 3 HU x 700 mm deep (without plug)				
Weight	44 kg	44 kg	44 kg	49 kg	49 kg
Mains Cable	4 x 4 mm ²	4 x 4 mm ²	4 x 4 mm ²	4 x 6 mm ²	4 x 6 mm ²
Output Cable Type JZ-600-Y-CY	2 x 10 mm ²	2 x 6 mm ²	2 x 4 mm ²	2 x 16 mm ²	2 x 10 mm ²
Mains Connection (X2)	Harting Han k4/0				
DC-Connection (X1)	Harting Han 2 MOD				

* Only with passive front panel

Technical Data GSW 100 – GSW 300

	GSW 200/800	GSW 200/900	GSW 200/1000	GSW 250/750	GSW 250/800
Output Power	20 kW	20 kW	20 kW	25 kW	25 kW
Output Voltage	800 V	900 V	1000 V	750 V	800 V
Output Current	40 A	40 A	35 A	60 A	50 A
Control	Current, voltage or power controlled				
Modes of Operation	Manual via front panel or external via A/D interface AS 4, AS 6 *, AS 4 F, Profibus or RS 232 / 485				
Set Point	0 ... 100 % of nominal current, voltage or power				
Output Accuracy	+/- 1 % of nominal value for current, voltage and power				
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically				
Indications	3 ½ digit display for current, voltage and power (Option)				
Noise Emission	$L_{pA} < 70$ dB (A)				
Mains Connection	3 x 400 V, + / -10 %, 50/60 Hz, PE (Option: 3 x 440 V or 3 x 480 V)				
Power Consumption	22 kVA	22 kVA	22 kVA	28 kVA	28 kVA
Fusing	3 x 40 A	3 x 40 A	3 x 40 A	3 x 50 A	3 x 50 A
Cooling	Water, > 3 l / min, 2 to 8 Bar, < 40° C Forced air, maximum ambient temperature 40° C				
Water Connection	Swagelok B-QC6 ...				
Cooling Capability of Water	900 W	900 W	900 W	1100 W	1100 W
Cooling Capability of Air	100 W	100 W	100 W	110 W	110 W
Size	19", 3 HU x 700 mm deep (without plug)				
Weight	49 kg	49 kg	49 kg	51 kg	51 kg
Mains Cable	4 x 6 mm ²	4 x 6 mm ²	4 x 6 mm ²	4 x 10 mm ²	4 x 10 mm ²
Output Cable Type JZ-600-Y-CY	2 x 10 mm ²	2 x 10 mm ²	2 x 6 mm ²	2 x 16 mm ²	2 x 10 mm ²
Mains Connection (X2)	Harting Han k4/0				
DC-Connection (X1)	Harting Han 2 MOD				

* Only with passive front panel

Technical Data GSW 100 – GSW 300						
	GSW 250/900	GSW 250/1000	GSW 300/500	GSW 300/750	GSW 300/800	GSW 300/1000
Output Power	25 kW	25 kW	30 kW	30 kW	30 kW	30 kW
Output Voltage	900 V	1000 V	500 V	750 V	800 V	1000 V
Output Current	50 A	45 A	70 A	66 A	60 A	50 A
Control	Current, voltage or power controlled					
Modes of Operation	Manual via front panel or external via A/D interface AS 4, AS 6 *, AS 4 F, Profibus or RS 232 / 485					
Set Point	0 ... 100 % of nominal current, voltage or power					
Output Accuracy	+/- 1 % of nominal value for current, voltage and power					
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically					
Indications	3 ½ digit display for current, voltage and power (Option)					
Noise Emission	$L_{pA} < 70$ dB (A)					
Mains Connection	3 x 400 V, + / -10 %, 50/60 Hz, PE (Option: 3 x 440 V or 3 x 480 V)					
Power Consumption	28 kVA	28 kVA	33 kVA	33 kVA	33 kVA	33 kVA
Fusing	3 x 50 A	3 x 50 A	3 x 63 A	3 x 63 A	3 x 63 A	3 x 63 A
Cooling	Water, > 3 l / min, 2 to 8 Bar, < 40° C Forced air, maximum ambient temperature 40° C					
Water Connection	Swagelok B-QC6 ...					
Cooling Capability of Water	1100 W	1100 W	1300 W	1300 W	1300 W	1300 W
Cooling Capability of Air	110 W	110 W	150 W	150 W	150 W	150 W
Size	19", 3 HU x 700 mm deep (without plug)					
Weight	51 kg	51 kg	53 kg	53 kg	53 kg	53 kg
Mains Cable	4 x 10 mm ²					
Output Cable Type JZ-600-Y-CY	2 x 10 mm ²	2 x 10 mm ²	2 x 16 mm ²	2 x 16 mm ²	2 x 16 mm ²	2 x 10 mm ²
Mains Connection (X2)	Harting Han k4/0					
DC-Connection (X1)	Harting Han 2 MOD					

* Only with passive front panel

ADL - Success with unlimited Functionality and Reliability



DC-Stromversorgungen HX 150 - HX 350

Das äußerst kompakte Design von ½ 19" Breite und 5 HE ist speziell für Produktionsanlagen entwickelt worden, bei denen auf Schaltschränke verzichtet werden soll. Die HX verfügt über Befestigungslaschen und kann in beliebiger Einbaulage direkt in die Anlagen integriert werden. Das Display ist schwenkbar und kann vom Gerät getrennt werden. Eine leistungsfähige Wasserkühlung sorgt auch in nicht klimatisierten Räumen für höchste Zuverlässigkeit. Zur Vermeidung von Kondenswasser kann ein externes Magnetventil über die integrierte Temperatursteuerung angeschlossen werden. Die Ausgangsleistung kann im Parallelbetrieb bis auf 280 kW gesteigert werden. Das spezielle Schaltungskonzept erlaubt sowohl einen Master-Slave-Betrieb, als auch eine Parallelansteuerung über Interface Combiner oder Profibus. Das extrem schnelle Arc-Handling arbeitet vollautomatisch, so daß keine Parameter eingestellt werden müssen.

DC-Power Supplies HX 150 - HX 350

The very compact design of ½ 19" width and 5 HU is especially designed for production plants without cabinets. The HX has mounting flanges and can be integrated into or attached to the plasma chamber in any position. The display can be swivelled and separated from the power supply. An efficient water cooling ensures highest reliability even in non-air-conditioned rooms. In order to avoid condensation water, an external magnetic valve can be connected via the integrated temperature control. The output power can be increased up to 280 kW in parallel operation. The special electronic design allows master-slave-operation as well as parallel operation via Interface Combiner or Profibus. The extreme fast arc handling works completely automatically, so that no parameters have to be set.

***Highlights

- * Output power 15 kW – 35 kW
- * Parallel operation up to 280 kW
- * Water cooling
- * Magnetic valve control
- * Housing ventilation with integrated particle separator
- * ½ 19"-case, 5 HU
- * Flange mounting
- * M8-female thread for crane eye
- * Replaceable, rotatable display
- * Automatic arc handling



HX in upright position with rotatable display

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Variations

Type	DC-Output			Order-No.
HX 150/400	15 kW	400 V	80 A	13Z010
HX 150/500	15 kW	500 V	60 A	13Z020
HX 150/600	15 kW	600 V	50 A	13Z030
HX 150/800	15 kW	800 V	30 A	13Z040
HX 150/1000	15 kW	1000 V	35 A	13Z050
HX 200/500	20 kW	500 V	70 A	13Z100
HX 200/800	20 kW	800 V	40 A	13Z110
HX 200/1000	20 kW	1000 V	30 A	13Z120
HX 250/500	25 kW	500 V	80 A	13Z190
HX 250/800	25 kW	800 V	50 A	13Z200
HX 250/1000	25 kW	1000 V	40 A	13Z210
HX 300/800	30 kW	800 V	60 A	13Z300
HX 300/1000	30 kW	1000 V	50 A	13Z310
HX 350/800	35 kW	800 V	70 A	13Z320



HX in horizontal position with rotatable display, front view

Options and Accessories	Order-No.
Interface AS 4	01Y001
Interface AS 4 F	01Y021
Interface AS 6	01Y061
Profibus Interface	01Y152
Interface RS 232 / 485	01Y181
Interface Combiner AM 2/3	50Y242
Interface Combiner MS 4	50Y245
Master Display MD 4	504261
Master Display MD 8	50Y262
HX-Display	01Y100
Arc link	10Y100
Bias Voltage Control	10Y035
Cathode Clamp Diode	50Y001
HX-Swagelok-Water Couplings straight	04Y070
HX-Swagelok-Water Couplings angled	04Y080
HX-Connector Set X1 / X2 straight	03Y400
HX-Connector Set X1 / X2 angled	03Y410
Magnetic Valve 24V DC with Connector Cable (2 m)	04Y030
Remote Control RC 4	06Y401

HX in horizontal position, rear view



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Interface Combiner AM 2/3

Mit dem AM 2/3 können bis zu drei baugleiche DC-Stromversorgungen (GX, HX, GSW) parallel zur Leistungssteigerung mit nur einer Ansteuerung betrieben werden.

Die DC-Stromversorgungen können auch mit Pulsgeneratoren verschaltet und über den Interface Combiner AM 2/3 überwacht werden. Damit steht eine Mittelfrequenzleistung von bis zu 105 kW (mit HX 350/800) zur Verfügung.

With the interface Combiner AM 2/3 up to three DC power supplies of the same type (GX, HX, GSW) can be operated in parallel with just one control in order to increase the power. The DC power supplies can be combined with pulse generators and also be controlled via Interface Combiner AM 2/3. In this way a medium frequency output power up to 105 kW (with HX 350/800) is available.

Interface Combiner MS 4

Mit dem Interface Combiner MS 4 können bis zu vier gleiche Stromversorgungen als „Master-Slave“-Kombination betrieben werden. Werden z. B. vier HX 350 zusammengeschaltet, steht eine Ausgangsleistung von 140 kW zur Verfügung. Sollte diese Leistung nicht reichen, können mit der Interface Extension S 4 bis zu acht Stromversorgungen (280 kW) kombiniert werden. Die DC-Stromversorgungen können auch mit Pulsgeneratoren verschaltet und über den Interface Combiner MS 4 überwacht werden. Damit steht eine Mittelfrequenzleistung von bis zu 280 kW zur Verfügung.

With the Interface Combiner MS 4 up to four power supplies of the same type (GX, HX, GSW) can be operated as „Master-Slave“-combination. In case that for example four power supplies type HX 350 are combined, an output power of 140 kW is available. If the power is not sufficient, with the additional interface extension S 4 up to eight power supplies (280 kW) can be combined. The DC power supplies can also be connected to pulse generators and controlled via Interface Combiner MS 4. In this way a medium frequency power of up to 280 kW is available.

Technical Data AM 2/3

	Interface Combiner AM 2/3
Modes of Operation	External Control via A/D-Interface AS 4, AS 6
Number of Interface-Connections	3
Principle of Operation	Parallel or Master/Slave
Compatibility	GX-, HX- and GSW with AS 4 / AS 6-Interface, also in combination with pulse generators
Auxiliary Voltage	Internal via power supply connected to X13
Size	Deep: 180 mm, Width: 148 mm, Height: 38 mm (without plug)
Weight	0.9 kg



Front view AM 2/3 with Status-LEDs

Technical Data MS 4 and S 4

	MS 4	S 4
Modes of Operation	External control via A/D-interface AS 4, AS 4 F, Profibus or RS 232 / 485	Control via MS 4
Number of Interface Connections	4 + Extension	4
Principle of Operation	Master/Slave	Slave
Compatibility	With all ADL-power supplies with AS 4-interfaces, also in combination with pulse generators	
Auxiliary Voltage	24 V DC +/- 10 %, max 1.4 A	
Size	19"-slide in, 1 HU x 206 mm deep (without plug)	
Weight	3.7 kg	3.1 kg

Master Display MD 4, MD 8

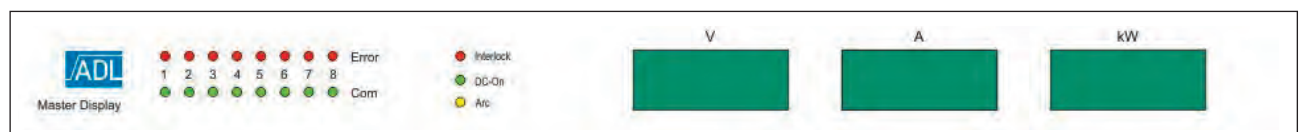
Ein Masterdisplay zeigt die addierten Istwerte von mehreren gleichen Stromversorgungen an, die zwecks Leistungssteigerung parallel betrieben werden. Die einzelnen Displays der Stromversorgungen werden durch ein Master Display ersetzt, das die Ausgangsspannung, den Gesamtstrom und die Gesamtleistung anzeigt.

A master display indicates the added set-values of several power supplies from the same type, which are operated in parallel at one load in order to increase the power. The single displays of each power supply are replaced by one master display, which indicates the output voltage, the total current and the total power.

Technical Data MD 4 and MD 8		
	MD 4	MD 8
Number of Display-Connections	4	8
Indications	3½ digit displays for current, voltage and power	
Analogue Output	Connection for Flow-controller (ADL-Accessory)	
Compatibility	All power supplies type "HX"	
Auxiliary Voltage	24V DC +/-10 %, max 500 mA	
Size	19"-slide in, 1 HU x 206 mm deep (without plug)	
Weight	3.3 kg	3.4 kg



Master Display MD 4



Master Display MD 8

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Technical Data HX 150 – HX 350					
	HX 150/400	HX 150/500	HX 150/600	HX 150/800	HX 150/1000
Output Power	15 kW	15 kW	15 kW	15 kW	15 kW
Output Voltage	400 V	500 V	600 V	800 V	1000 V
Output Current	80 A	60 A	50 A	30 A	25 A
Control	Current, voltage or power controlled				
Modes of Operation	External via A/D interface AS 4, AS 6, AS 4 F, Profibus or RS 232 / 485				
Set Point	0 ... 100 % of nominal current, voltage or power				
Output Accuracy	+ / - 1 % of nominal value for current, voltage and power				
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically				
Indications	3 ½ digit display for current, voltage and power (Option)				
Noise Emission	$L_{pA} < 70$ dB (A)				
Mains Connection	3 x 400 V, + / -10 %, 50/60 H, PE (Option: 3 x 440 V or 3 x 480 V)				
Power Consumption	16.5 kVA	16.5 kVA	16.5 kVA	16.5 kVA	16.5 kVA
Fusing	3 x 25 A	3 x 25 A	3 x 25 A	3 x 25 A	3 x 25 A
Cooling	Water, > 3 l / min, 2 to 8 Bar, < 40° C Forced air, maximum ambient temperature 40° C				
Water Connection	SMC KQ2 10 mm (Option: Swagelok B-QC6 ...)				
Cooling Capability of Water	680 W	680 W	680 W	680 W	680 W
Cooling Capability of Air	80 W	80 W	80 W	80 W	80 W
Size	Width: 218 mm, Height: 222 mm, Deep: 645 mm (without plug)				
Weight	35 kg	35 kg	35 kg	35 kg	35 kg
Mains Cable	4 x 4 mm ²	4 x 4 mm ²	4 x 4 mm ²	4 x 4 mm ²	4 x 4 mm ²
Output Cable Type JZ-600-Y-CY	2 x 25 mm ²	2 x 16 mm ²	2 x 10 mm ²	2 x 6 mm ²	2 x 4 mm ²
Mains Connection (X2)	Harting Han k4/0				
DC-Connection (X1)	Harting Han 2 MOD				

Technical Data HX 150 – HX 350

	HX 200/500	HX 200/800	HX 200/1000	HX 250/500	HX 250/800	HX 250/1000
Output Power	20 kW	20 kW	20 kW	25 kW	25 kW	25 kW
Output Voltage	500 V	800 V	1000 V	500 V	800 V	1000 V
Output Current	70 A	40 A	35 A	80 A	50 A	40 A
Control	Current, voltage or power controlled					
Modes of Operation	External via A/D interface AS 4, AS 6, AS 4 F, Profibus or RS 232 / 485					
Set Point	0 ... 100 % of nominal current, voltage or power					
Output Accuracy	+ / - 1 % of nominal value for current, voltage and power					
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically					
Indications	3 ½ digit display for current, voltage and power (Option)					
Noise Emission	$L_{pA} < 70$ dB (A)					
Mains Connection	3 x 400 V, +/-10 %, 50/60 H, PE (Option: 3 x 440 V or 3 x 480 V)					
Power Consumption	22 kVA	22 kVA	22 kVA	28 kVA	28 kVA	28 kVA
Fusing	3 x 35 A	3 x 35 A	3 x 35 A	3 x 50 A	3 x 50 A	3 x 50 A
Cooling	Water, > 3 l / min, 2 to 8 Bar, < 40° C Forced air, maximum ambient temperature 40° C					
Water Connection	SMC KQ2 10 mm, (Option: Swagelok B-QC6 ...)					
Cooling Capability of Water	950 W	900 W	900 W	1100 W	1100 W	1100 W
Cooling Capability of Air	150 W	100 W	100 W	110 W	110 W	110 W
Size	Width: 218 mm, Height: 222 mm, Deep: 645 mm (without plug)					
Weight	37 kg	37 kg	37 kg	39 kg	39 kg	39 kg
Mains Cable	4 x 6 mm ²	4 x 6 mm ²	4 x 6 mm ²	4 x 10 mm ²	4 x 10 mm ²	4 x 10 mm ²
Output Cable Type JZ-600-Y-CY	2 x 16 mm ²	2 x 10 mm ²	2 x 6 mm ²	2 x 25 mm ²	2 x 10 mm ²	2 x 10 mm ²
Mains Connection (X2)	Harting Han k4/0					
DC-Connection (X1)	Harting Han 2 MOD					

Technical Data HX 150 – HX 350

	HX 300/800	HX 300/1000	HX 350/800		
Output Power	30 kW	30	35 kW		
Output Voltage	800 V	1000 V	800 V		
Output Current	60 A	50 A	70 A		
Control	Current, voltage or power controlled				
Modes of Operation	External via A/D interface AS 4, AS 6, AS 4 F, Profibus or RS 232 / 485				
Set Point	0 ... 100 % of nominal current, voltage or power				
Output Accuracy	+ / - 1 % of nominal value for current, voltage and power				
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically				
Indications	3 ½ digit display for current, voltage and power (Option)				
Noise Emission	$L_{pA} < 70$ dB (A)				
Mains Connection	3 x 400 V, +/-10 %, 50/60 H, PE (Option: 3 x 440 V or 3 x 480 V)				
Power Consumption	33 kVA	33 kVA	39 kVA		
Fusing	3 x 63 A	3 x 63 A	3 x 63 A		
Cooling	Water, > 3 l / min, 2 to 8 Bar, < 40° C Forced air, maximum ambient temperature 40° C				
Water Connection	SMC KQ2 10 mm, (Option: Swagelok B-QC6 ...)				
Cooling Capability of Water	1300 W	1300 W	1500 W		
Cooling Capability of Air	150 W	150W	150 W		
Size	Width: 218 mm, Height: 222 mm, Deep: 645 mm (without plug)				
Weight	41 kg	41 kg	41 kg		
Mains Cable	4 x 10 mm ²	4 x 10 mm ²	4 x 10 mm ²		
Output Cable Type JZ-600-Y-CY	2 x 16 mm ²	2 x 10 mm ²	2 x 16 mm ²		
Mains Connection (X2)	Harting Han k4/0				
DC-Connection (X1)	Harting Han 2 MOD				

DC-Stromversorgungen HX 900 - HX 1400

DC-Power Supplies HX 900 - HX 1400

High power, economical and very reliable

- Nicht-reaktive Beschichtungsprozesse für Kathoden bis 4 Meter Länge
- Sehr schnelles Freisputtern von oxidierten Kathoden
- Automatisches Arc-Management (bis zu 40.000 Arcs/sec)
- Automatische Leistungskompensation bis 2.000 Arcs/sec
- Wassergekühlt
- Hoher Wirkungsgrad (95 % bei Nennleistung)

- Non-reactive coating processes for cathodes up to 4 m length
- Very fast elimination of oxide films
- Automatic arc management (up to 40.000 Arcs/sec)
- Automatic power compensation up to 2.000 arcs/sec
- Water cooling
- High efficiency (95 % at nominal power)



HX 1400

Customer Consultants / Germany:
 Holger Rueckert, h.rueckert@adl-gmbh.com
 Ralf Comtesse, r.comtesse@adl-gmbh.com
 Tel. +49 (0) 6151 86072-41 or -42

Variations

Type	DC-Output			Order-No.
HX 900	90 kW	800 V	180 A	14Z110
HX 1050	105 kW	800 V	210 A	14Z120
HX 1200	120 kW	800 V	240 A	14Z130
HX 1400	140 kW	800 V	280 A	14Z140

Options and Accessories	Order-No.
Interface AS 4	01Y001
Interface AS 4 F	01Y021
Interface AS 6	01Y061
Profibus Interface	01Y152
Interface RS 232 / 485	01Y181
Remote Control RC 4	06Y401

Mains Controller MC 8

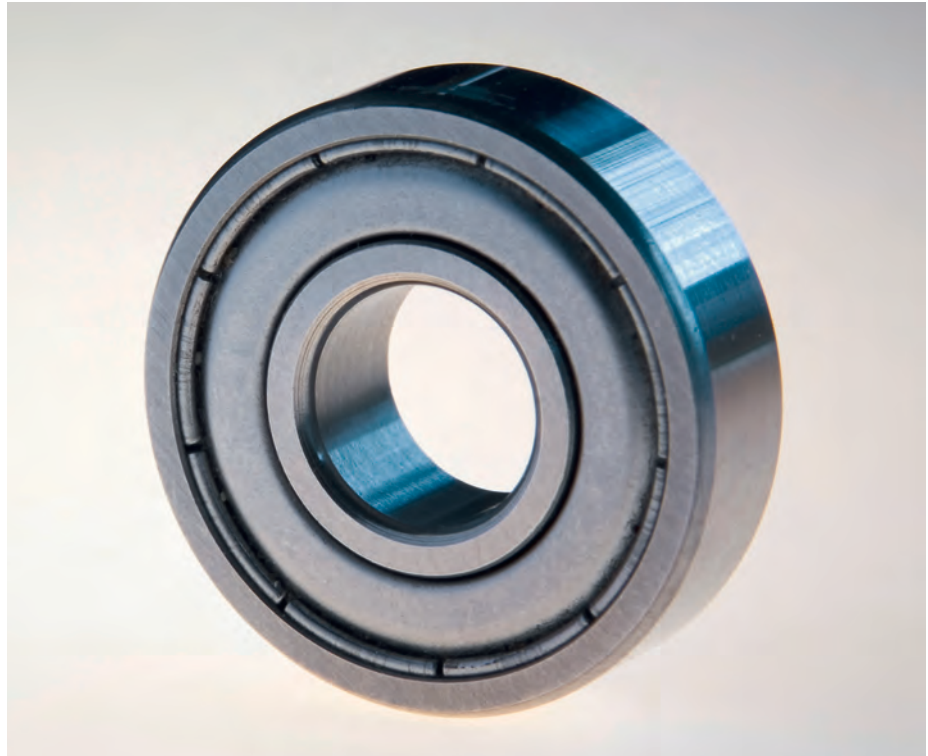
Master Display MD 4



Technical Data HX Cabinet				
	DC Power Supplies			
	HX 900	HX 1050	HX 1200	HX 1400
Output Power	90 kW	105 kW	120 kW	140 kW
Output Voltage *	800 V	800 V	800 V	800 V
Output Current *	180 A	210 A	240 A	280 A
Control	Current, voltage or power controlled or voltage controlled with ignition automatic			
Modes of Operation	External via A/D interface AS 4, AS 4 F, AS 6, Profibus und RS 232 / 485			
Set Point	0 ... 100 % of nominal current, voltage or power			
Output Accuracy	+ / - 1 % of nominal value for current, voltage or power			
Arc Suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically			
Indications	3 ½ digit display for current, voltage and power			
Mains Connection	3 x 400 V, +/- 10 %, 50/60 Hz, PE (Option: 3 x 440 V or 3 x 480 V)			
Power Consumption	100 kVA	118 kVA	135 kVA	155 kVA
Fusing	3 x 160 A	3 x 200 A	3 x 224 A	3 x 250 A
Cooling	Water 4 – 8 Bar, < 40° C, Forced air, maximum ambient temperature 40° C			
Water Flow	> 15 l/min		> 20 l/min	
Cooling Capability of Water	4 kW	5 kW	5.5 kW	6.5 kW
Cooling Capability of Air	0.6 kW		0.8 kW	
Size	Cabinet, 33 HE Width 600 mm, height 1800 mm, deep 830 mm (without water connection and plug)			
Weight	360 kg		400 kg	
Water Connection	1" female thread			
Drain	10 mm tube			
Compressed Air	4 – 8 Bar, 10 mm tube			
Mains Cable	4 x 50 mm²	4 x 70 mm²	4 x 95 mm²	
Output Cable	3 x JZ-600-Y-CY, 2 x 16 mm²		4 x JZ-600-Y-CY 2 x 16 mm²	

* Other voltage and current ranges on request

ADL - Long Lifetime with hard Coatings



Stromversorgungen für Ionenquellen

Für den Betrieb von Ionenquellen (Kaufmann und ECR) stehen verschiedene Spezialgeräte zur Verfügung, die auf Anfrage auch mit anderen Ausgangsspannungen oder Leistungen angeboten werden können. Alle Geräte sind wahlweise mit einer Analog-Schnittstelle oder mit Profibus ausgestattet.

Power Supplies for Ion Sources

For the operation of ion sources (Kaufmann and ECR) special power supplies are available. On request the units can also be equipped with other output voltages or output power. All supplies have an analogue interface or profibus.



Accelerator



Beam



Neutralizer



Cathode



Discharge

Customer Consultants / Germany:
 Holger Rueckert, h.rueckert@adl-gmbh.com
 Ralf Comtesse, r.comtesse@adl-gmbh.com
 Tel. +49 (0) 6151 86072-41 or -42

Variations

Type	DC-Output			Order-No.
GG 03 Accelerator	300 W	1000 V	300 mA	09Z001
GG 03.1 Accelerator	30 W	1000 V	30 mA	09Z002
GG 08 Accelerator	800 W	1000 V	800 mA	09Z005
GG 12 Beam	1.2 kW	2000 V	1 A	09Z011
GG 12.1 Beam	200 W	2000 V	100 mA	09Z012
GIP 10 Neutralizer	990 W 25 W 25 W	33 V 25 V 25 V	30 A 1 A 1 A	09Z021
GIP 10.1 Neutralizer	990 W 2.5 W	33 V 25 V	30 A 0.1 A	09Z022
GDI 09 Discharge	900 W	150 V	6 A	09Z031
GC 10 Cathode	1 kW	35 V	30 A	09Z051

Options and Accessories	Order-No.
Interface AS 4	01Y001
Profibus Interface	01Y152
Interface RS 232 / 485	01Y181

Technical Data GC 10 Cathode

	GC 10 Cathode
Output Power	1 kW
Output Voltage	35 V, floating up to 2 kV
Output Current	30 A
Control	Current, voltage or power controlled
Modes of Operation	Manual via front panel or external via A/D interface AS 4, Profibus or RS 232 / 485
Set Point	0 ... 100 % of nominal voltage or current
Indications	3 ½ digit display for voltage and current
Noise Emission	$L_{pA} < 70$ dB (A)
Mains Connection	230 V, + / -10 %, 50/60 Hz, PE 1200 VA
Cooling	Forced air, max. ambient temperature 40° C
Size	½ 19" slide-in, 3 HU (132.5 mm), 560 mm deep
Weight	11 kg

Technical Data GDI 09 Discharge

	GDI 09 Discharge
Output Power	900 W
Output Voltage	150 V, floating up to 2 kV
Output Current	6 A
Control	Voltage or current controlled
Modes of Operation	Manual via front panel or external via A/D interface AS 4, Profibus or RS 232 / 485
Set Point	0 ... 100 % of nominal voltage or current
Indications	3 ½ digit display for voltage and current
Noise Emission	$L_{pA} < 70$ dB (A)
Mains Connection	230 V, + / -10 %, 50/60 Hz, PE, 1200 VA
Cooling	Forced air, max. ambient temperature 40° C
Size	½ 19" slide-in, 3 HU (132.5 mm), 560 mm deep
Weight	11 kg

Technical Data Accelerators					
	GG 03	GG 03.1	GG 08	GG 12	GG 12.1
Output Power	300 W	30 W	800 W	1.2 kW	200 W
Output Voltage	Negative, max. 1000 V	Negative, max. 1000 V	Negative; max. 1000 V	Positive, max. 2000 V	Positive, max. 2000 V
Output Current	300 mA	30 mA	800 mA	1 A	100 mA
Control	Voltage or current controlled				
Modes of Operation	Manual via front panel or external via A/D interface AS 4, Profibus or RS 232 / 485				
Setpoint	0 ... 100 % of nominal voltage or current				
Indications	3 ½ digit displays for voltage and current				
Noise Emission	$L_{pA} < 70$ dB (A)				
Mains Connection	230 V, + / -10 %, 50/60 Hz, PE				
	500 VA	100 VA	1000 VA	1500 VA	250 VA
Cooling	Forced air, max. ambient temperature 40° C.				
Dimensions	½ 19.5" slide-in, 3 HU (132.5 mm), 560 mm deep.				
Weight	11 kg				

Technical Data GIP 10 and GIP 10.1 Neutralizer

	Cathode	GIP 10 Discharge	Emission	Cathode	GIP 10.1 Emission
Output Power	990 W	25 W	25 W	990 W	2.5 W
Output Voltage	33 V	25 V	25 V	33 V	25 V
Output Current	30 A	1 A	1 A	30 A	0.1 A
Control	Emission or filament current controlled				
Modes of Operation	Manual via frontpanel or external via A/D Interface AS 4, Profibus or RS 232 /485				
Set Point	0 ... 100 % of nominal emission or filament current				
Indications	3 ½ digit display for emission and filament current				
Noise Emission	$L_{pA} < 70$ dB (A)				
Mains Connection	230 V, + / -10 %, 50/60 Hz, PE , 1200 VA				
Cooling	Forced air, maximum ambiente temperature 40° C				
Size	½ 19" slide-in, 3 HU (132.5 mm), 560 mm deep				
Weight	11 kg				

ADL - Enlightening and trendsetting Ideas



Schnittstellen

AS 4 Order-No. 01Y001

Analogschnittstelle (0-10 V für Istwerte und Sollwert), Steuereingänge (24 V/DC), Statusausgänge (Relais)

AS 4 F Order-No. 01Y021

Analogschnittstelle wie AS 4, aber mit schnellerer Signalverarbeitung und Sonderfunktionen

AS 6 * Order-No. 01Y061

Analogschnittstelle wie AS 4, aber mit drei Sollwerteingängen für gleitende U-, I-, P-Regelung

* nicht für alle Geräte geeignet

Profibus Order-No. 01Y152

Zur Anbindung an den Profibus DP

RS 232 / 485 Order-No. 01Y181

Universelle Anbindung an diverse digitale Geräte



Weitere Schnittstellen auf Anfrage
Other interfaces on request



Interfaces

AS 4

Analogue interface (0-10 V for actual values and set value), control inputs (24 V/DC), status outputs, (relay)

AS 4 F

Analogue interface, like AS 4, but with faster signal processing and special functions

AS 6 *

Analogue interface like AS 4, but with three set values, inputs for a gliding U-, I-, P-control

* not available for all power supplies

Profibus

To connect to the Profibus DP

RS 232 / 485

All-purpose connection for various digital devices

Interface Combiner

AM2 Order-No. 50Y211

Parallelbetrieb von zwei Stromversorgungen mit Analogschnittstelle AS 4

AM2/3 Order-No. 50Y242

Parallelbetrieb von drei Stromversorgungen mit Analogschnittstelle AS 4



Interface Combiner

AM2

Parallel operation of two power supplies with analogue interface AS 4

AM2/3

Parallel operation of three power supplies with analogue interface AS 4

Master Oszillatoren

OM20 Order-No. 50Y301

Synchronisation von 2 bis 5 Pulsge-neratoren vom Typ SD 150 oder SD 300

OM 1 Order-No. 50421

Synchronisation von Pulsge-neratoren vom Typ SD 151 - SD 351 mit einem Frequenzbereich von 1 - 4 kHz

OM 2 Order-No. 50422

Synchronisation von Pulsge-neratoren vom Typ SD 151 - SD 351 mit einem Frequenzbereich von 6 - 20 kHz

OM 3 Order-No. 50423

Synchronisation von Pulsge-neratoren vom Typ SD 151 - SD 351 mit einem Frequenzbereich von 12 - 40 kHz

OMV Order-No. 50Y410

Betrieb von Pulsge-neratoren vom Typ SD 351 mit kundenspezifischer Frequenz und Pausenzeit (Bestellung auf Anfrage)



Master Oscillators

OM20

Synchronization of 2 up to 5 pulse generators, types SD 150 or SD 300

OM 1

Synchronization of pulse generators, type SD 151 - SD 351, with a frequency range from 1 - 4 kHz

OM 2

Synchronization of pulse generators, type SD 151 - SD 351, with a frequency range from 6 - 20 kHz

OM 3

Synchronization of pulse generators, type SD 151 - SD 351, with a frequency range from 12 - 40 kHz

OMV

Pre-set oscillator for the operation of pulse generators, type SD 351, with customized frequency and break time (order on request)

Test Oszillator

OT 40 Order-No. 50Y401

Mit diesem Gerät können Fre-quenz und Pausenzeit unabhängig voneinander eingestellt werden. Während des Testbetriebes einer Anlage lassen sich damit die opti-malen Werte für Frequenz und Pausenzeiten ermitteln.



Test Oscillator

OT 40

With the OT 40 the frequency and the pulse off time can be set independently from each other. The perfect values for frequency and pulse off time can be deter-mined during a test operation.

Stecker / Plugs

GS 50 - GS 150

(Netzeingang und DC-Ausgang)

(Mains input and DC-output)



Order-No. 03Y020



Order-No. 03Y040

GX 50 - GX 150

(Netzeingang und DC-Ausgang)

(Mains input and DC-output)



Order-No. 03Y220



Order-No. 03Y240

GSW 100 - GSW 300 and HX 150 - HX 300

(Netzeingang und DC-Ausgang)

(Mains input and DC-output)



Order-No. 03Y120



Order-No. 03Y140

Kühlwasserkupplungen

Water Couplings

Beidseitig schließende Schnellkupplungen jeweils für Vor- und Rücklauf

Water couplings, closing at both ends, for reloading and return flow



Order-No. 04Y020



Order-No. 04Y040

Magnetventil

Zur Steuerung der Kühlwassertemperatur bei Geräten mit integrierter Magnetventilsteuerung.

Order-No. 04Y030



Magnetic Valve

For controlling the temperature of the cooling water for power supplies with integrated magnetic valve control.



Remote Control

RC 4 Order-No. 06Y401

Manuelle Fernbedienung für alle DC-Stromversorgungen, AS 4 inkl.

Manual remote control for all DC-Power Supplies, AS 4 included.



Kathodenfreilaufdiode

D300 Order-No. 50Y001

Vehindert das Umschwingen der Spannung während der Arc-Löschung.

Cathode Clamp Diode

D300

Prevents the overshooting of the voltage during Arc-suppression.



Kabel / Cable JZ-600-Y-CY

Spezialkabel zur Verbindung der Stromversorgungen mit Kathoden oder anderen Lasten. Das Kabel ist für alle DC-Stromversorgungen und Pulsgeneratoren bis zu einer Ausgangsspannung von 1000 V geeignet.

Special cable to connect the power supplies with the cathode or other loads. The cable can be used for all power supplies and pulse generators for an output voltage up to 1000 V.

Technical Data

Temperature range:	-5° C bis +80° C
Nominal voltage:	0.6/1 kV
Test voltage:	4000 V
Minimum bending radius:	10 x Outside diameter



Aufbau / Cable structure

Cu-Litze blank, feindrähtig
PVC-Aderisolation
Abschirmgeflecht aus verzinnnten CU-Drähten
PVC-Außenmantel

Bare copper, fine wired
Special PVC core insulation
Braided screen of tinned Cu wires
Special PVC outer sheath

Core cross-section mm ²	Outside diameter mm	Weight kg/km	Order-No.
2 x 1.5	10.6	162	E015-0019
2 x 2.5	12.1	272	E015-0224
2 x 4	13.8	306	E015-0194
2 x 6	15.2	420	E015-0193
2 x 10	18.6	845	E015-0217
2 x 16	22.4	1150	E015-0204
24 x 1.5	24.9	1241	E015-0247

ADL-Kundensupport: Beschichtungstests ADL-Customer Support: Coating Tests

Beschichtungslabor mit Applikationen und Testmöglichkeiten Coating Laboratory with Applications and Testing

Lösungen für den Kunden und Lösungen mit den Kunden zu finden ist die Maxime der ADL GmbH und seiner Partner seit mehr als 25 Jahren. Im unternehmenseigenen Beschichtungslabor können alle Stromversorgungen und Generatoren im Einsatz getestet werden.

To find solutions for the customer and with the customer is the precept of ADL GmbH and its partners for more than 25 years. All ADL power supplies can be tested during operation, in the company owned coating laboratory.



Reaktive und nicht reaktive Sputterprozesse mit: Reactive and non-reactive Sputter Processes with:



DC

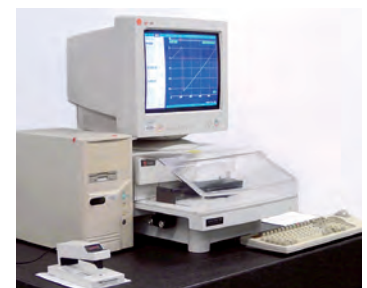
Unipolar

Bipolar



Folgende Testbeschichtungen sind möglich: The following Test Coatings are possible:

- Ag, Al, Cu, Ce, Cr, Fe, In, ITO, Mg, Mo, Ni, NbOx, NiCr, NiV₇, Si, Sn, Ti, TaOx, V, Zn, ZnO: (Al₂O₃), ...
- Oxide und Nitride / Oxides and Nitrides
- Standard- und exotische Materialien / Standard and exotic materials
- Kundenspezifische Anforderungen / Customized applications
- Weitere Beschichtungen auf Anfrage / Other coatings on request



Beratung / Consulting

Technischer Service beginnt bei ADL lange vor dem Kauf eines ADL-Gerätes!

Mit Unterstützung bereits

- bei der Planung einer Beschichtungsanlage,
- bei Modifizierungen, Nachrüstungen,
- über Fragen rund um Prozesse und Anlagenperipherie,
- bis zu Schulungen am Gerät.

Mit mehr als 25 Jahren Erfahrung in der Vakuumbeschichtung ist ADL ein Kompetenzzentrum, von dem Anlagenbauer, aber auch Endkunden profitieren.

Technical Service begins with ADL long before finally buying an ADL-device!

With support already

- during planning a coater
- for modifications or retrofitting
- concerning all questions related to processes and plant periphery
- up to coaching and trainings on ADL power supplies and generators.

With more than 25 years of experience in vacuum coating, ADL is a competence center for the benefit of companies designing coating plants as well as for the benefit of end customers.

Trainings

ADL bietet den Mitarbeitern seiner Kunden, ob Inbetriebnehmern, Servicepersonal oder auch interessierten Entwicklern, die Möglichkeit, die Besonderheiten und Arbeitsweisen der ADL-Produkte kennenzulernen. An den ADL-eigenen Leistungsprüfständen sowie im ADL-Labor erlernen sie die Inbetriebnahme, den Umgang mit dem Oszilloskop, die Wartung und Fehlererkennung. Die Schulungen sind individuell auf den Kundenbedarf abgestimmt und werden auf Wunsch auch in englischer Sprache angeboten.

Start-up engineers, service personnel or interested R & D-engineers of ADL customers are offered individual trainings about the special design and operating principle of ADL products. In the testing department they learn how to connect the power supply and the coating plant, how to use and interpret the oscilloscope and oscillogram, as well as maintenance work and error detection and correction. The trainings are offered in German and English.



ADL-Kundensupport: Verkauf und Service weltweit ADL-Customer Support: Sales and Service worldwide



Robustes Design, geringste Fehlerrate - "Made in Germany"

ADL Produkte haben eine sehr geringe Fehlerrate, bezogen auf die maximale Leistung, 24 Stunden an 7 Tagen in der Woche. Diese geringe Ausfallrate basiert auf mehr als 25 Jahren Erfahrung.

Es kann von einer Fehlerrate von weniger als 1 % bei einer MTBF von 70.000 Stunden ausgegangen werden, sogar bei Betrieb unter schlechtesten Bedingungen.

Eine robuste Konstruktion, die ausschließliche Verwendung von Qualitätsprodukten, vorge-testeten Komponenten und der abschließende Leistungstest garantieren für alle ADL Produkte eine lange Lebensdauer.

Präventive Wartungen sind nicht notwendig!

**Gewährleistung auf alle ADL Produkte:
24 Monate.**

Robust design, minimal failure rate - "Made in Germany"

In general ADL products have a very low failure rate (max. load 24 hours, 7 days a week), based on more than 25 years of experience.

A failure rate of less than 1 %, related to MTBF of 70.000 hours, can be assumed, even under worst-case scenarios.

Robust product design, the usage of high quality components, pre-tested sub-assemblies and the final stress test of all products guarantee a long lifetime of ADL products.

Preventive maintenance is not required!

Warranty of all ADL products: 24 months.

ADL-Kundensupport: After-Sales-Service und Garantie

ADL-Customer Support: After-Sales-Service and Warranty

After-Sales-Service-Konzept im Alltag:

Das Baukastenprinzip erlaubt die einfache Handhabung im Reparaturfall: Schadhafte Komponenten können beim Kunden vor Ort repariert oder getauscht werden. Darüber hinaus kann ein komplettes Gerät ganz einfach auf der Basis von "Plug and Play" ausgetauscht werden, da eine umständliche Programmierung entfällt.

Autorisierte ADL Partner verfügen vor Ort über "Back-up"-Geräte, die sie dem Kunden auf Wunsch zur Verfügung stellen.

Die Reaktionszeit beträgt während der regulären Arbeitszeit 24 Stunden (Sondereinbarungen sind auf Wunsch möglich).

Autorisierte ADL Partner werden regelmäßig bei ADL in Deutschland oder vor Ort aus- und weitergebildet und sie verfügen über ein ADL-zertifiziertes Reparatur- und Testcenter.

Muss die ADL Stromversorgung zur Reparatur zu ADL geschickt werden, kann ein Reparaturservice innerhalb von 24 Stunden auf Kundenwunsch ermöglicht werden - nach Eintreffen des Gerätes bei ADL in Deutschland.

After Sales Service Concept based on existing practice:

A modulare construction system allows easy handling in the rare cases of failure: Defective components can be repaired or replaced in the field. Furthermore the complete power supply can easily be replaced by a back-up unit in "plug and play" mode.

ADL business partners have "back-up" units as well as spare parts, available on customer request.

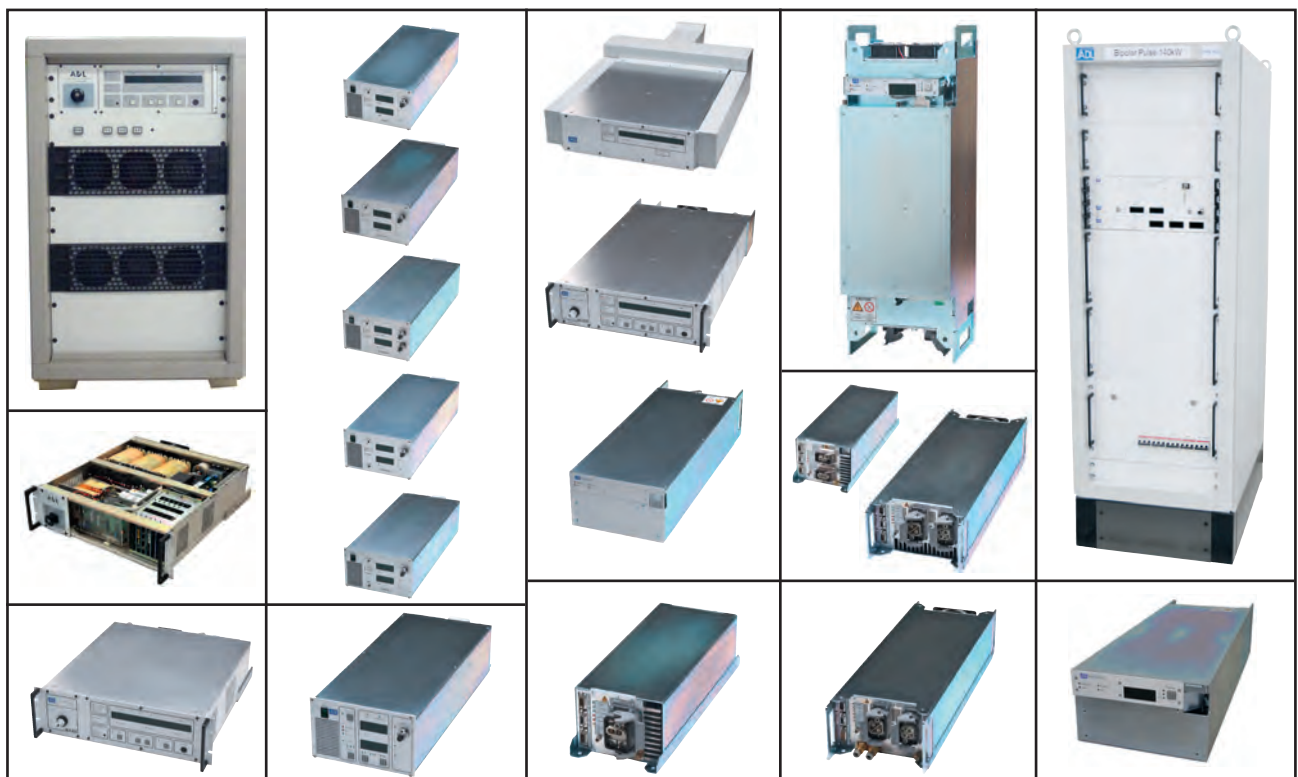
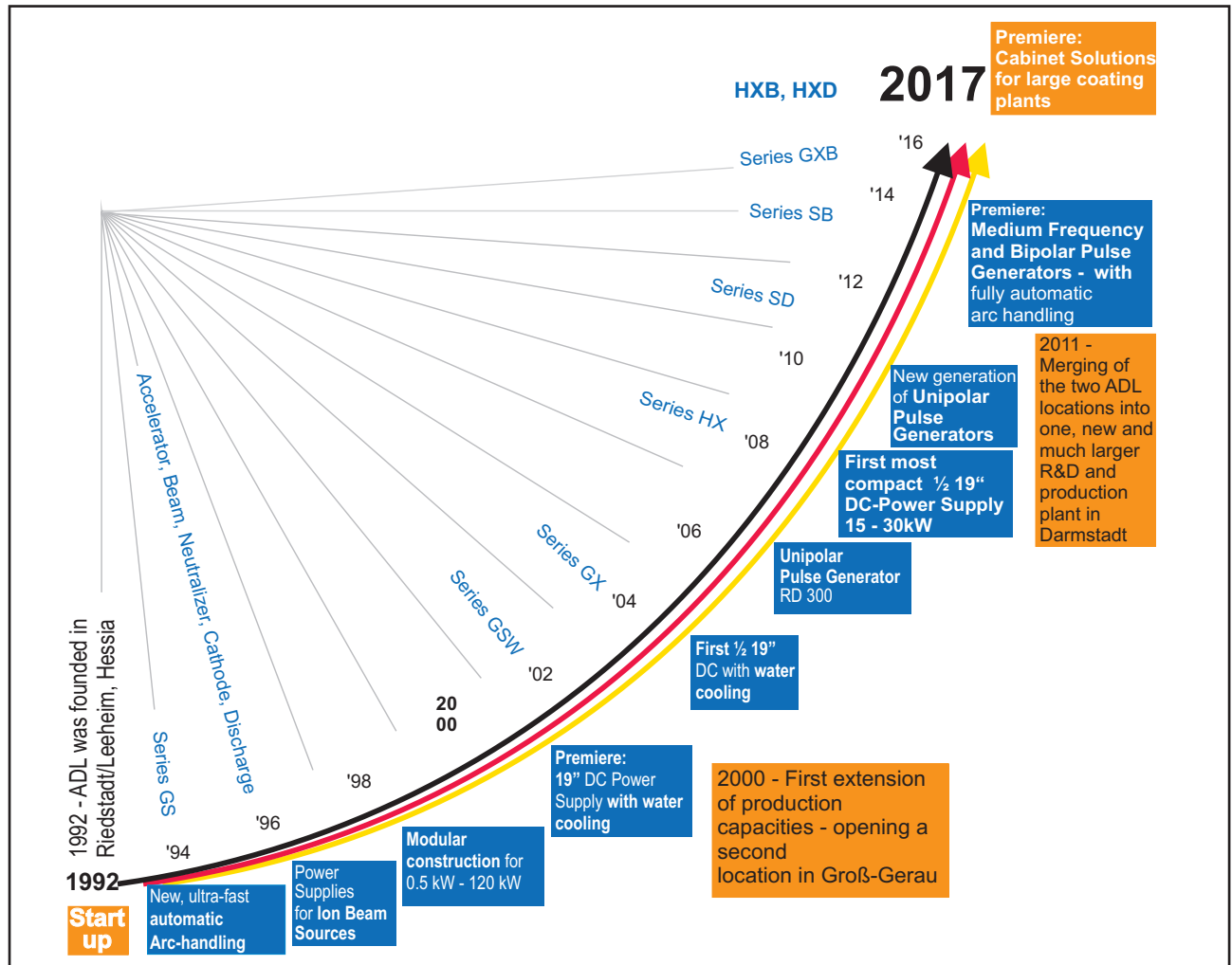
Reaction time during the regular working hours within 24 hours (special arrangements on request).

ADL business partners are regularly trained by ADL in Germany or at their service location and they have an ADL certified repair and testing center.

If the power supply has to be send back to ADL for repair, a repair service in between 24 hours can be offered on request, after the arrival at ADL in Germany.



Meilensteine seit 1992 / Milestones since 1992



Welcome to ADL in Darmstadt



Imprint

ADL

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Michael Houben

Entry in County Court:

Amtsgericht Darmstadt, HRB 53147

Tax Specifics:

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