IBF Electronic GmbH & Co. KG

Product Guide

Industrial Microwave

IBF Electronic GmbH & Co. KG

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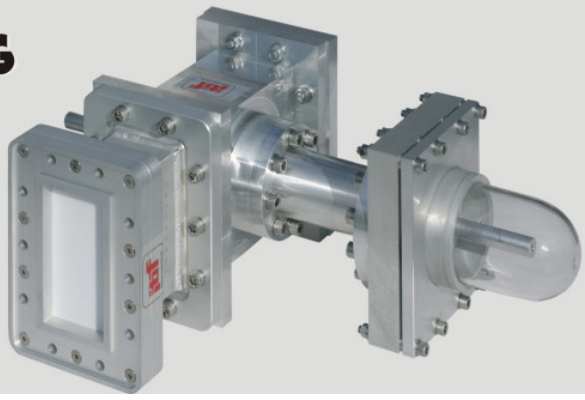

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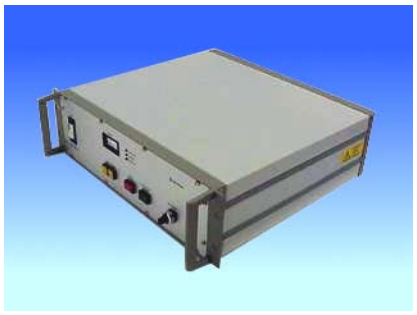
Company Profile

IBF Electronic offers a complete line of industrial microwave components and products. Specialised in custom designs, for both the industrial and the plasma application market. For all industrial ISM frequencies, like 2.45 GHz, 5.8 GHz and 915 (896/922) MHz. Special design for waveguides applicators, special microwave generators for both heating and plasma are IBF Electronics power. Controlled manually or by various interfaces, or industrial bus controlled systems. We are specialized in pulsed power generators. We have more than 25 years of experience in these developments of microwave components and applicators.
Next to our extensive standard program our strength is in the development of new and custom devices and generators.
Power levels from 100watt up to 120kW in both ISM frequencies.
Almost all generators or microwave system are available in component sets, for easy construction at OEM systems.
Our flexibility and design experience is known world-wide.
Of course, also magnetrons and electron tubes are available as well as spares for all types of generators .

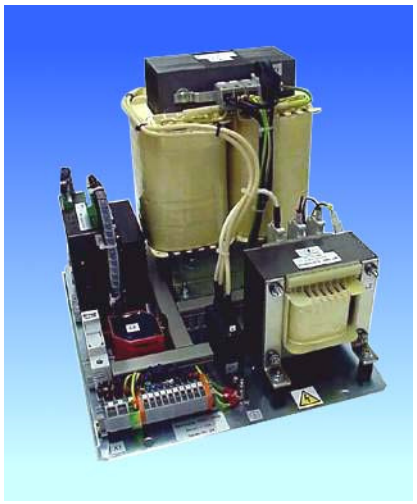
We are the competent partner for research institutes and universities, in the development and manufacturing of special or standard systems.

Please contact us for additional information or specifications.

Power supplies for magnetrons



Power supply for 300 W magnetrons
Power supply with continuous power-control from almost 0 to 100%, controlled by the electromagnet of the magnetron. Designed for external (remote) magnetron head. Designed, to drive the magnetron type: YJ1530SP or equivalent electromagnet controlled magnetrons. Connections from the magnetron head to the power-supply set of cables. Microwave line ripple: 100%, p to p, 100Hz. Line voltage 230V at 50Hz. Other line voltages and frequencies are available on request.



Power supply for 1.45kW magnetrons.
Power supply, with thyristor or triac control.
Power control from 5 to 100%. Control by a dc signal from 0 to 10V. Enable signal to switch on and off the high voltage. Open frame construction, for easy mounting in the OEM's cabinets. Microwave ripple 100% at 50Hz. Available for power levels of 100 W to 3000W.
Line voltages of 230 to 400V, with 50 or 60 Hz line frequencies.

Double power supply with LC stabilisation
Open frame chassis, contains two LC power supplies for magnetrons with power level of 1.45kW. The double open construction, specially designed for easy OEM mounting in industrial applications or cabinets. A very cost effective solution. Connections for both power supplies, separately controllable via the connections on the connection board.
Microwave ripple is 100%, p to p, line voltages 230V, at 50Hz. All other line voltages and line frequencies available on request. Available for magnetron with power levels, from 100 W up to 3000 W.

Double power supply for 2 * 1.2kW magnetron
Power supply with thyristor or triac control, mounted into a closed cabinet. Magnetron output power control from 5% up to 100% continuously. External control with a dc voltage of 0 to 10V. All electrical connections are mounted on the back-side of the cabinet. Cabinet in 19"cabinet with a height of 6HE. Available for all magnetrons in power level of 100W up to 3000 W. Line voltage 230V at 50 Hz. On customers request all other line voltages and line frequencies are available.

Please contact us for additional information or specifications.

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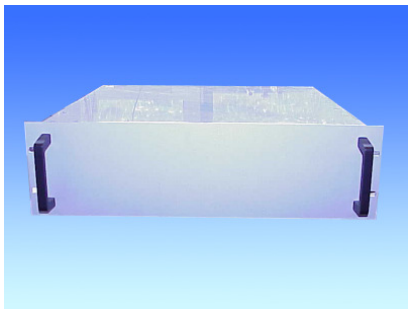
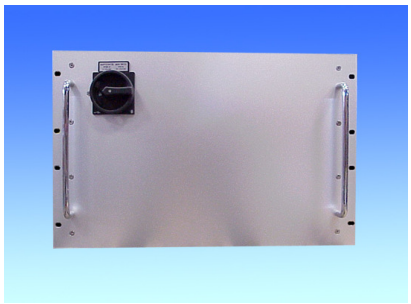
Pulsed power supply for 300 W magnetrons
Pulsed power supply, with integral continuous power control for magnetrons at 300watt. Designed for remote magnetron-heads. This power supply is designed for CW usage and to be pulsed from dc to 20kHz, with a peak level of approx. 600W, dependable of the duty factor of the pulses, pulse input enable externally or internally. Microwave line ripple: <2% p to p. Available from power levels from 100 W up to 3000 W.

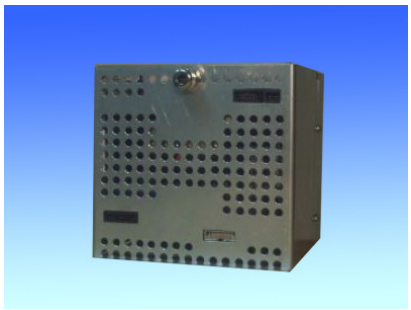
Remark: Pulse levels up to 15kW pulse are feasible at these power supply designs. Due to the high voltage pulse system used. Pulsed power-supplies are specially designed for high performance and high pulse power plasma systems, or special microwave heating systems. Magnetrons used, mostly are standard industrial magnetrons.



Single / double switch mode power supply, 1x2/4kW or 2x2/4kW, 19“ housing 3 HE, pulsable
Single or double switch mode power supply for operation of one or two 2kW magnetrons. CW- (up to 2kW) or pulsed operation possible. According to pulse and pause duration are microwave pulses up to 4kW possible. Ideal for plasma applications and minimum pulse / duration 1ms. Pulse frequencies up to 500Hz.



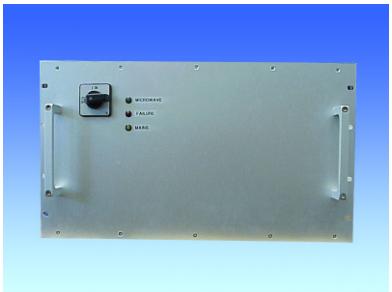
Power supply 6kW, 19“ cabinet, 6HE
Inductive power supply special design for magnetron type YJ1600 or equivalent. Line power: three phase 400V. Other line voltages on request. Microwave output ripple < 3%. In 19“ cabinet for easy rack mounting. Control via PLC-Interface or remote control unit. Variable output power up to 6kW. Electromagnet power control.



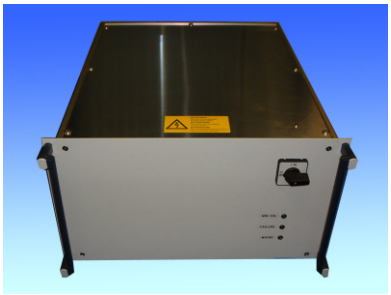
Switch mode power supply, 1kW high ripple
High voltage power supply for 1kW Magnetron. Compact Conrol via PLC comatible signals, 0V/24V and 0..10V. Variable current controlled output power, 100% microwave ripple. Outputs actual voltage and current. Up to 3 power supplies can be combined to operate magnetrons up to 3kW. Line voltage : 230V +/- 10%, 50/60Hz.

Switch mode power supply, 1kW High Ripple
Integral switch mode power supply for operation of 1kW magnetron. Operation via LCD-Panel and push buttons on front side. Compact design. Variable output power from 100watt to 1000watt. Indicator for actual power, current, and -voltage. 100% microwave ripple.
Line voltage: 230V +/- 10%, 50/60Hz.

Switch mode power supply, 2kW High Ripple
Integral switch mode power supply for operation of 2kW magnetron. Operation via LCD-Panel and push buttons on front side. Compact design. Variable output power from 200watt to 2000watt. Indicator for actual power, current, and -voltage. 100% microwave ripple.
Line voltage: 230V +/- 10%, 50/60Hz.



Power supply 2kW, pulsable
Continuous wave or pulsed operation with variable duty-cylce. Output power control with integral electron tube. 19“ cabinet for easy rack mounting. Control via can-bus or remote control unit. Low mircowave output ripple. Line voltage: 3 phase 400V. Other voltages on request. Minimum pulse / pause duration 20µs. Microwave pulse frequencies up to 25kHz.



Power supply 800W / 5,8 GHz, pulsable
Continuous wave or pulsed operation with variable duty-cylce. Output power control with integral electron tube. 19“ cabinet for easy rack mounting. Control via can-bus or remote control unit. Low mircowave output ripple. Line voltage: 3 phase 400V. Other voltages on request.
Pulse frequencies up to 5kHz.

All available power-supplies can be equipped with a suitable magnetron-head. This will give “matched” generator, where the magnetron and the power supplies are matched, for maximum efficiency. Also all required interface systems can available, like CAN-Bus, RS232, RS485, PLC, or Profi-Bus, Inter-Bus, etc.

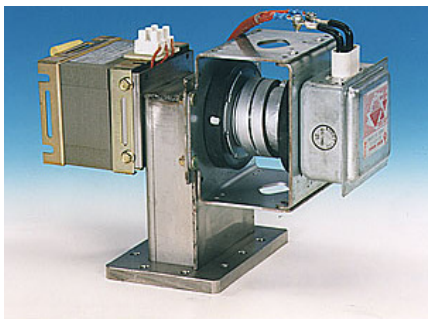
Please contact us for additional information or specification.

Magnetron-heads for 2.45 GHz

General: All magnetron-heads can also be supplied in the following waveguide sizes:
R32/WR284/WG10, R26/WR340/WG9A and R22/WR430/WG8

Water-cooled magnetron-head

Features a water-cooled magnetron in a closed housing. Photo waveguide size: R26/WR340/R9A. All electrical connections are available at the front-side of the magnetron-head. Also the high voltage input can, optionally, be equipped with a suitable high voltage connector. Connectors and housing are protected, by an interlock contact or switch. Available in power-levels from 300W up to 3000W.



Water-cooled, open frame, magnetron-head

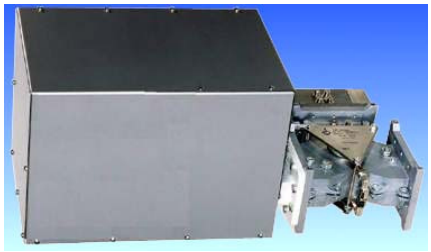
Features a water-cooled magnetron, mounted onto a suitable waveguide/launcher. Equipped with suitable filament transformer and electrical connection-mounting. Photo waveguides size: R26/WR340/R9A. High voltage connection directly to filament transformer tap or at the magnetron FA (filament) connection. Available in power-levels from 300W up to 3000W.

Forced air-cooled magnetron-head

Features an air-cooled magnetron in a closed housing. Photo waveguide size: R26/WR340/R9A. Complete with integral cooling fan with air-inlet and -outlet. All electrical connections are available at the front side of the magnetron-head. Also the high voltage input can be, optionally, equipped with a suitable high voltage connector. Connectors and housing are protected, by an interlock contact or switch. Available in power levels from 300W up to 3000W.

Forced air-cooled, open frame, magnetron-head

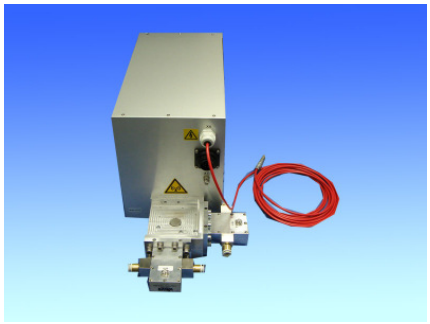
Features an air-cooled magnetron mounted onto a suitable waveguide/launcher. Equipped with suitable filament transformer and electrical connection-mounting.
Photo waveguide size: R26/WR340/R9A. High voltage connections directly to filament transformer tap or at the magnetron FA (filament) connection. Available in power-levels from 300W up to 3000W.



Water-cooled high power magnetron-head combinations

Features a high power magnetron-head, complete with electromagnet control and all required control and super- visory systems. The electrical connections via external connectors. Water-cooling system is protected by a suitable water-flow monitor switch. The internal forced air-cooling system is also protected by an airflow monitor switch. Equipped with an external isolator, with optionally, a reflected power measurement. Cabinet is protected by interlock switches, to prevent against opening under high voltage conditions. Waveguide size at photo: R26/WR340/WG9A. Available power levels: 6000W up to 30kW.

Magnetron-heads for 5.8 GHz



Forced air-cooled magnetron-head
Features a water-cooled 800W magnetron-head. WR153 / R58. All electrical connections are accessible on front side. Isolator mounted for stable operation of the magnetron also under load changing conditions.

Please contact us for additional information or specification.

Microwave generators for low power

Microwave generator for: 10 x 1kW power supplies
Rittal cabinet, equipped with 10 power supplies, SCR controlled, to supply: 10 separate magnetron-heads for 1kW, individually. Control level from approx: 5% up to 100%, continuously. Cabinet, completely wired, for each separate magnetron-head equipped with suitable connectors for the connection of the separate magnetron-heads. System equipped with VDE interlock system and control potentiometers for all individual power supplies. The complete system can be controlled by PLC interface as well. Anode voltage ripple: 100%. Cabinet size: 800*800*2000mm (B*W*H). CE compliant, equipped with internal line filters. Line voltage 3phase: 400V at 50Hz. (Other line voltages and line frequencies on request).

Microwave generators for high power

Microwave generators, with internal or external magnetron-head
Rittal cabinet, equipped complete microwave generator. Microwave outlet positioned at the back side of the cabinet(optionally on the side or the top of cabinet).Equipped with inductive power supplies. Complete, with water-cooling system and air-cooling system, both internal. Line voltages: 3phase 400V at 50Hz(Optionally: Other line voltages and line frequencies). Microwave output in R26/WR340/WG9A or from 10kW upwards: R22/WR430/WG8. Standard equipped with internal RS232 interface, alternatively CAN-Bus. Internal or external isolator system. Equipped with forward and reflected power metering as a standard feature. Optionally PLC or all available Bus-systems. EMC cabinet available. Cabinet size: 6kW: 600*600*1400mm.(B*W*H) 10kW,15kW, 20kW or 30kW, cabinet size: approx: 2400*800*2000mm (B*W*H). Remark: Also available with remote magnetron-head. CE compliant.

Special design (customized) microwave generator.
Generator, equipped with 4*6kW switched mode power supplies to power remote magnetron-heads. All 4 magnetron-heads equipped with isolator and reflected power measurement. All 4 power-supplies, were equipped to pulse at max. rate of: 1KHz. An automatic waveguide tuning system was integrated into the power supply cabinet.
The complete system can be controlled manually or by Profi-bus system. Cabinet dimensions: 600*800*2000mm.(B*W*H). Complete generator Ce compliant.
Line voltage: 3phase 400V at 50/60Hz. Anode voltage ripple: 5% p/p. Cabinet EMC compliant.

Please contact us for additional information or specifications.

Special design, customised, Microwave generators

Special design for 5 power-supplies of 6kW, each remote magnetron-heads
Power supply cabinet equipped with 5 switched mode power supplies. Each power supply individually controllable, manually or alternatively by Inter-bus interface. Special input design for closed-loop-control systems. Like infra-red-temperature metering and control. Magnetron-heads equipped with isolator and reflected power measurement for feed-back control. Cabinet dimensions: 1200*800*2000(B*W*H).
Line voltage: 3phase 400V at 50/60Hz.
Anode ripple: 5%.-p/p. Cabinet EMC is compliant.
Generator is CE compliant.

Special design for 60kW at 915MHz, power supply.
Power supply is equipped with switched mode power sets. For light weight and lesser place. It gives a very stable quick response power supply. The units are modular designed, so lower or higher power is feasible. The dedicated magnetron-heads are show in the chapter magnetron-heads. Line voltage: 3 phase 400V at 50/60Hz, others on request, available up to 120kW of microwave power.

Special design microwave generator, for 915MHz, power level: 100kW
Power supply and magnetron head are integrated in one cabinet. The microwave output is positioned on top of this cabinet and protected by a suitable isolator. The generator is 100% full reflection protected at all phases. All cooling systems are protected and supervised by monitor systems, standard interfaces:RS232, alternatively CAN-bus. Power supply is an inductive version, anode current ripple: <= 5%, p/p. Line voltage: 3phase at 400V/50Hz. Generator is CE compliant. Also available in 30, 50/60, 75 , 90 or 120kW. Waveguide size: R9/WR975. Cabinet dimensions: 800*2400*2000mm(B*W*H).

General: All above generator systems are “customized” generators, specially designed for a special customers application. If required all interfaces systems can be added for control, like: PLC, RS232, RS485, Can-bus, Interbus, Profibus, etc, etc. waveguide sizes: R32/WR284/WG10, R26/WR340/WG9A and R22/WR430/WG8.

Please contact us for additional information or specifications.

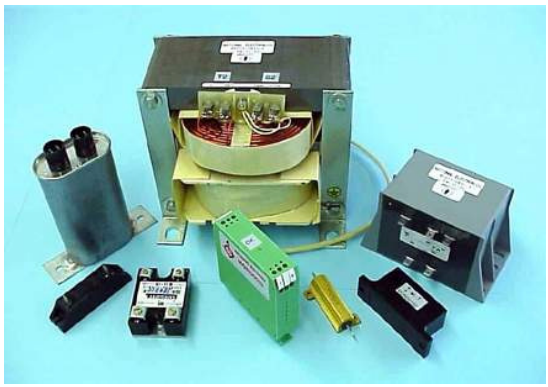
Special design, pulsed microwave generators 2.45GHz

Special design microwave pulse generator, for 2.45GHz, power level: 4x3kW cw, 10kW pulse
Cabinet with four pulse generator power supplies. Maximum cw microwave power 3000W with a matched load. Peak pulse power 10kW. Anode current ripple <5%, p/p. Pulse rise and fall time <10µs. Variable duty cycle with pulse on-time from 25µs to 10ms and off-time from 25µs to 100ms. Average output power in pulse mode limited to 3kW. Line voltage: 3phase 400V at 50 Hz, others on request. Manually operation with 4 control units integrated on front of the cabinet. Interfaces PLC and RS232. Other industry interfaces available on request. Separate water-cooled magnetron heads with flange R26/WR340/R9A. Magnetron-heads equipped with isolators to protect magnetron from reflected power.

Special design microwave pulse generator, for 2.45GHz, power level: 9x1kW
Cabinet equipped with nine separate pulse generator power supplies. Each power supply with maximum power 1000W in cw and pulse mode. Control unit integrated in cabinet to control generators and set parameters. Synchronous operation of all 9 generators in pulse mode possible. For nine repeating periods every generator can be defined on or off. Anode current ripple <5%, p/p. Pulse rise and fall time <10µs. Variable duty cycle with pulse on-time from 25µs to 10ms and off-time from 25µs to 100ms. Line voltage 3phase 400V at 50Hz. External control over CAN-bus interface. Other line voltages and interfaces on request.

Please contact us for variations of generators above and additional information or specifications.

Components and component sets for industrial microwave applications – L-C stabilisation versions



Component set for 1.45 kW magnetron

Type Description	850 W LC set	1.10 kW LC set	1.25 kW LC set	1.45 kW LC set	2.0 kW LC set	3.0 kW LC set
Magnetron	2M167 2M107	2M244 2M246	2M137 YJ1540	2M262 NI10254	2M278 2M259	2M265 2M266
Launcher unit	WR340LAUNB	WR340LAUNB	WR340LAUNB	WR340LAUNB	WR340LAUNB	WR340LAUNB
Isolator	WR340ISOLATOR003CA	WR340ISOLATOR003CA	WR340ISOLATOR003CA	WR340ISOLATOR003CA	WR340ISOLATOR003CA	WR340ISOLATOR003CA
H.V. transformer 230V / 50Hz	LT019/0877-0	LT019/0871-0	LT019/0812-0	LT019/0850-0	LT019/0840-0	LT019/0874-0
Filament transformer 230V / 50Hz	FT019/0878-0	FT019/0822-0	FT019/0829-0	FT019/0851-0	FT019/0842-0	FT019/1090
H.V. transformer 400V / 50Hz	LT019/0877-1	LT019/0871-1	LT019/0812-1	LT019/0850-1	LT019/0840-1	LT019/0874-1
Filament transformer 400V / 50Hz	FT019/0878-1	FT019/0822-1	FT019/0829-1	FT019/0851-1	FT019/0842-1	FT019/1001
H.V. diode	MON00050	MON00050	MON00050	MON00050	2x MON00050	MON00055
H.V. capacitor	HC25103N50	HC25130N50	HC25130N50	HC25130N50	2x HC25130N50	2x HC25130N50
Capacitor mount	HCMOUNT	HCMOUNT	HCMOUNT	HCMOUNT	HCMOUNT	HCMOUNT
Thermoswitch for magnetron	331 534	331 534	331 534	331 534	331 534	331 534
Cooling fan for air cooled magnetron. Complete with protecting shield and capacitor.	G2E108-AA101	G2E108-AA101	G2E108-AA101	G2E120-AR77-01	G2E120-AR77-01	G2E120-AR77-01
Soft-start relay 230V	PSD4850	PSD4850	PSD4850	PSD4850	PSD4850	PSD4850
Soft-start relay 400V	PSD4850	PSD4850	PSD4850	PSD4850	PSD4850	PSD4850
Shutter relay	KS100	KS100	KS100	KS100	KS100	KS100
Varistor for soft-start relay 230V	RV0250	RV0250	RV0250	RV0250	RV0250	RV0250
Varistor for soft-start relay 400V	RV0450	RV0450	RV0450	RV0450	RV0450	RV0450
Supervisory unit	MON00010	MON00010	MON00010	MON00010	MON00011	MON00011
Measuring resistor	RH50-15R	RH50-12R	RH50-10R	RH50-8R2	RH50-8R2	RH50-6R8
Protective diode	MON00140	MON00140	MON00140	MON00140	MON00140	MON00140
ARC detector	MON00020	MON00020	MON00020	MON00020	MON00020	MON00020

Remark:
Above table also will be available for line voltages:110V, 208V, 380V and 400V.
Line frequencies 50 and 60Hz. Other line voltages and line frequencies on request.

This overview, will be updated on a regular base.

Please contact us for additional information or specifications.

Component and component sets for industrial applications – SCR controlled versions

Component set for 2 kW magnetron

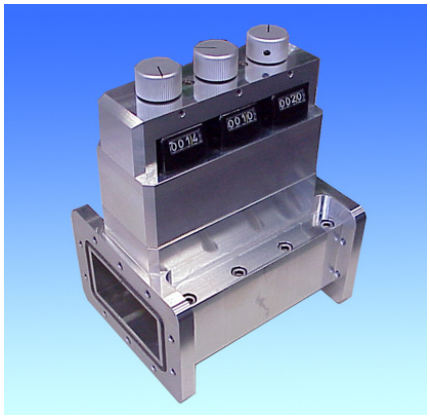
Type Description	850 W set	1.10 kW set	1.25 kW set	1.45 kW set	2.0 kW set	3.0 kW set
Magnetron	2M167 2M107	2M244 2M246	2M137 YJ1540	2M262 NI10254	2M278 2M259	2M265 2M266
Launcher unit	WR340LAUNB	WR340LAUNB	WR340LAUNB	WR340LAUNB	WR340LAUNB	WR340LAUNB
Isolator	WR340ISOLATOR003CA	WR340ISOLATOR003CA	WR340ISOLATOR003CA	WR340ISOLATOR003CA	WR340ISOLATOR003CA	WR340ISOLATOR003CA
H.V. transformer 230V / 50Hz	HT019/0879-0	HT019/0872-0	HT019/0806-0	HT019/0854-0	HT019/0841-0	HT019/0875-0
Filament transformer 230V / 50Hz	FT019/0878-0	FT019/0822-0	FT019/0829-0	FT019/0851-0	FT019/0842-0	FT019/0842-0
H.V. transformer 400V / 50Hz	HT019/0879-1	HT019/0872-1	HT019/0806-1	HT019/0854-1	HT019/0841-1	HT019/0875-1
Filament transformer 400V / 50Hz	FT019/0878-1	FT019/0822-1	FT019/0829-1	FT019/0851-1	FT019/0842-1	FT019/0842-1
H.V. rectifier	BV019/0846-0	BV019/0846-0	BV019/0846-0	BV019/0846-2	BV019/0846-2	2x MON00055
Anode current choke	CH019/0880	CH019/0873	CH019/0852	CH019/0843	CH019/0853	CH019/0876
Thermoswitch for magnetron	331 534	331 534	331 534	331 534	331 534	331 534
Cooling fan, for forced aircooled magnetrons. Complete with protecting shield and capacitor	G2E108-AA101	G2E108-AA101	G2E108-AA101	G2E120-AR77-01	G2E120-AR77-01	G2E120-AR77-01
SCR control unit for V.line: 230V/50Hz	MON01082-230V-0.8K	MON01082-230V-1.0K	MON01082-230V-1.2K	MON01082-230V-1.5K	MON01082-230V-2.0K	PC3.0KW-230V 3x SSR-HV-230V MON00900
SCR control unit for V.line:400V/50Hz	MON01082-400V-0.8K	MON01082-400V-1.0K	MON01082-400V-1.2K	MON01082-400V-1.5K	MON01082-400V-2.0K	PC3.0KW-400V 3x SSR-HV-400V MON00900
Varistor 230V for transformer	RV0250	RV0250	RV0250	RV0250	RV0250	RV0250
Varistor 400V for transformer	RV0450	RV0450	RV0450	RV0450	RV0450	RV0450
Filament-Controller	---	---	---	---	---	SSR-F-230V or SSR-F-400V
ARC detector	MON00020	MON00020	MON00020	MON00020	MON00020	MON00020

Remark:
Above table also will be available for line voltages: 110V, 208V, 380V and 400V.
Line frequencies 50 and 60Hz. Other line voltages and line frequencies on request.

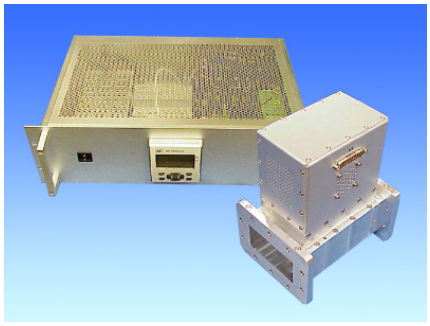
This overview, will be updated on a regular base.

Please contact us for additional information or specifications.

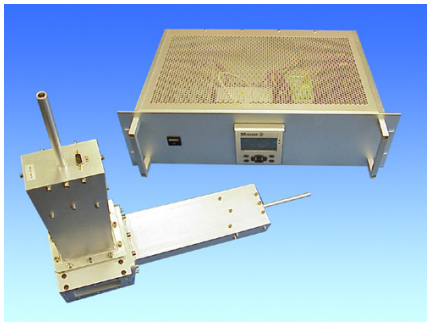
Waveguide, three stub tuners, special versions



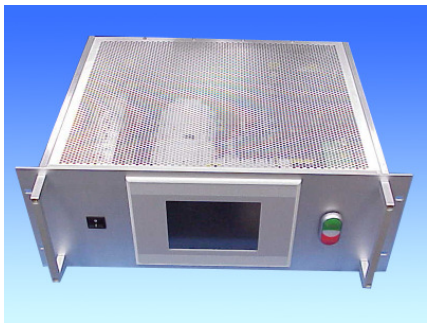
Manual tuner
with a mechanical decimal read-out display for the stub position, also equipped with a mechanical locking nut. Waveguide size in WR340/R26/WG9A or WR430/R22/WG8 or WR284/R32/WG10. Max. power level up to 6000watt. See high power versions for higher power control.



3-stub motorised automatic tuning system
with flanges R26 / WR340. 19“, 3HE control unit. Manual or automatic operation selectable. Automatic tuning via measured voltage of a reflected power measuring diode. Control panel with push buttons for display and configuration.Available also for R9 / WR975 waveguide systems.

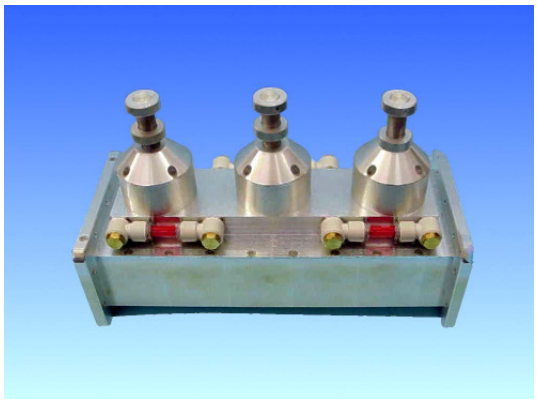


E-H motorised automatic tuning system
Consists of two variable, motorized waveguide shorts and control unit for motor supply and control. Manual or automatic control. Automatic tuning over reflected power input (BNC-input for voltage provided by microwave detector). LCD-panel with push buttons for control and display of all variables. Comprehensive parameterization via user interface.

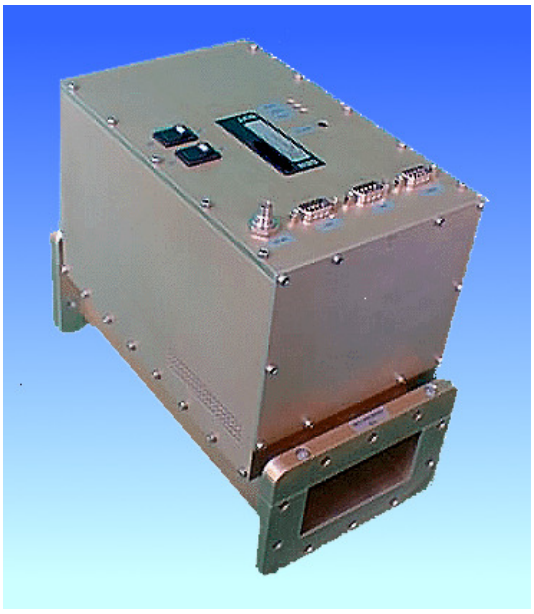


Control unit for motorised tuners
Alternative control unit for above motor tuners. with 5.7“ touchpanel for control of all tuner functions, 19“ chassis. Available with monochrome or colour display and infrared or resistive technology. Storing and access of up to 100 tuner positions. Graphical curve of reflected power.

Please contact us additional information or specifications.



High power, three stub tuners
Manual three stub tuner. For power levels up to 30kW at 2.45GHz.
Stubs are equipped internally, with a special designed 1/4Lambda choke, to avoid microwave leakage. Optionally available with mechanical decimal stub position display and mechanical locking system.
The tuner housing is water-cooled.
Available for all suitable wave-guide sizes.



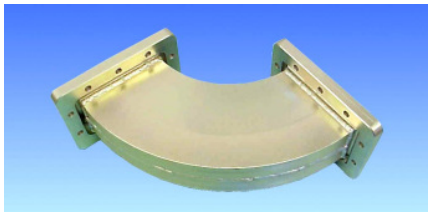
Automatic tuner. (ECO-TUNER).
Fully automatically, matched the load.
Measuring system is integrated, measures the forward and reflected power and phase.
Will calculate the right stub position for the required vswr. All three stubs are involved in the load matching procedure. Reaction time very quick(from max. to min. stub position, within 6 seconds). Can be used as a stand alone system, only 24Vdc required. If equipped with Windows software can be controlled by a PC. Unit is standard equipped with RS232 and Can–bus interface. Via the optional windows software all vector measurements are feasible. Tuning system can be switched on or off via the optional windows software, for vector analysis of the application/applicator. Very compact and economical design. Requires, external 24V. DC supply voltage. Available in all waveguide sizes.

Above tuning systems are also available in following waveguide sizes:
R32/WR284/WG10, R26/WR340/WG9A and R22/WR430/WG8.

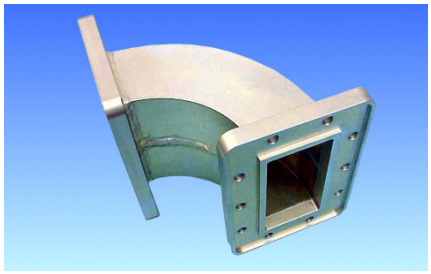
Contact us for any additional information or specifications.

Waveguide components for 2.45GHz

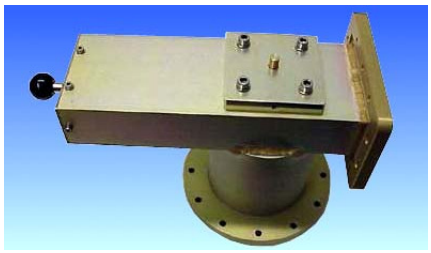
Waveguides are available in different materials, like: Aluminium, brass, Stainless steel, copper.
Waveguide sizes: R32/WR284/WG10, R26/WG340/WR9A and R22/WG430/WG9.



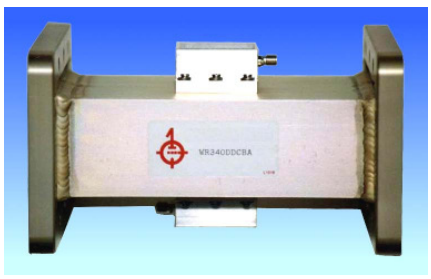
H-bend 90”deg.
Waveguide bend in H plane, material aluminium. Low VSWR, < 1.05. Sweep version, also available in miter version. Available in different flange types. Also available in all waveguide sizes. Material aluminium, aludine silver plated.



E-bend 90”deg.
Waveguide bend in E plane, material aluminium. Low VSWR, <1.05. Sweep version, also available in miter version. Available in different flange types. Also available in all waveguide sizes. Material, aluminium, aludine silver plated.



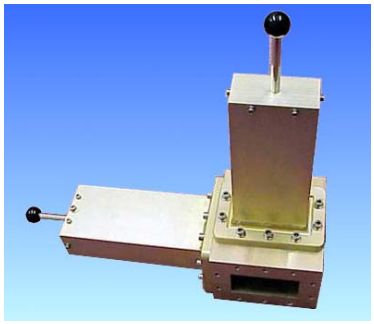
Mode transformer
Mode transformer, from rectangular mode to circular mode. A special design for in-coupling under severe vacuum or other applications. Standard design in aluminium, for light weight. Different circular flanges, with -and without windows are available as well. Circular waveguide available from 10 to 150mm. Low VSWR, with two different matching devices, a sliding short and an impedance antenna. Available in several lengths and diameters, matched to the specific application. Customised versions available to match customer specifications, also in coaxial version.



Double directional director or -coupler, mounted on a waveguide
Two miniature directional detectors or -couplers, mounted on a prefab aluminium waveguide. Directional detector coupler, type DD112, to measure directly the forward and the reflected power, through the waveguide. The output signal, -dc, is proportional to the forward or reflected power through the waveguide. Output connectors in SMA.

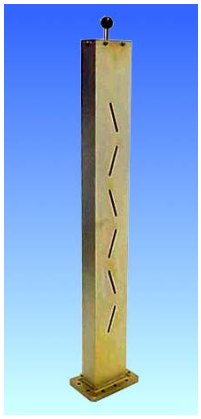
The directional couplers, will give a microwave attenuated output, which will be proportional to the power in the waveguide, like type:DC213.The degree of attenuation can be chosen between 60, 70 or 80dB, please note required attenuation at ordering. Connectors in SMA or “N”, for well matching to standard power-meters. All waveguide types are available. Like waveguide sizes, in R22/R26 or R32. The directivity for both type of couplers is >20dB. For the directional couplers, several types of diodes are available, like R451570, BNC to “N”. For the directional detectors, a number of different measuring systems or –units are available.

Please contact us additional information or specifications.



E/H tuner, manual version

Waveguide tuner in both H and E plane for optimal tuning. The “shorting plungers are available in both: contact types, but also in a contact-less version. Manual control, motor-drive and auto-tuning are available too. Material in aluminium. In all different waveguide versions. For extra fine tuning, a version with a manual course-control is also available.

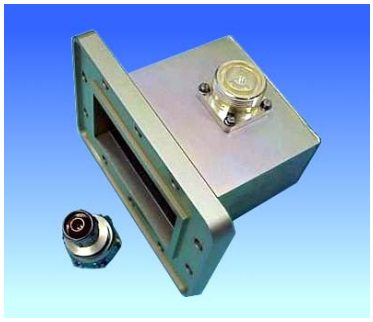


Slotted antenna applicator

Waveguide applicator, in slotted technique. For a maximum homogeneous field. Available in different slot-numbers, like 1 up to 20 slots per waveguide. Standard in aluminium, at waveguide R26. Also available in different waveguides and materials. Available, without sliding short tuner, or sliding short tuning with fine tuning. Without tuner and tuning stubs close to the first slot. Can be designed to fit into almost all applicator system. Also available in pressure or vacuum versions. Contact us for additional information.

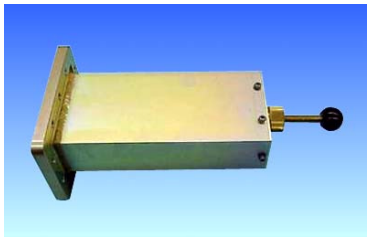
Three stub tuner, manual version, without metering

Three stub tuner, for standard manual use. For load matching of the application(load) to the magnetron. Max. allowed power up to 3kW. Available in R26/WR40/WG9A. Waveguide material in aluminium.



Waveguide transitions

Waveguide transitions are available in the following versions: R26 to coaxial: “7/16”and “N”. Maximum power level: < 1000watt. R26 to R22, and R32 to R26, R32 to R22. Also all versions to the “7/16”and to “N” type connectors, our special customised versions, from any waveguide to any coaxial or waveguide type. All versions low VSWR, <1.1. Material: aluminium. Also available for rectangular, to circular waveguides and to coaxial waveguide.

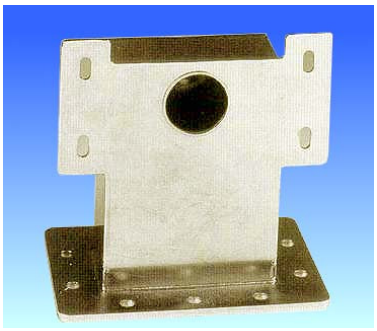


Sliding short, in rectangular waveguide

Sliding short waveguides are available in two different versions. One version in which the sliding short is manual and of a contact version. The other version, the internal sliding short is contact-less. The plunger can, optionally be equipped with a fine tuning and a locked system. Optionally, an automatic tuning, with stepper motors is available, also. Available in all three waveguides, like: R32/WR284/WG10, R26/WR340/ WG9A and R22/WG430/WG9. Sliding short is also available in an automatic motor controlled version for automatic tuning or matching, as a reference the reflected power signal should be supplied. Signal from an isolator or alternatively via a directional coupler or detector. All waveguide are available in as standard in aluminium, but also in brass, copper.

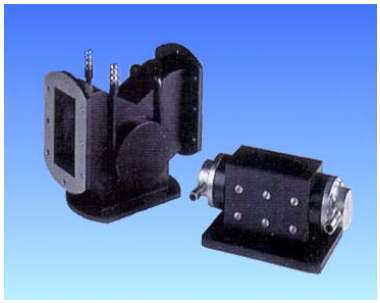
Circulators and isolators

Available in required waveguides and power-levels.
Insulation minimum: 25dB, VSWR: <1.25.
Above 6kW, the circulators are water-cooled.
The loads are always water-cooled, above 300watt CW. Also available for max.300watt, a coaxial version, only forced air for cooling or a heat sink is required. All isolators are provided with monitors connectors on port:1 and on port: 3, for monitoring forward and reflected power measurements.
Power amplifiers and measuring diodes, dedicated to those monitor ports, are available as well. Partnr: DC/DC-AMP., contact us for more information.



Incoupling/launchers systems, for magnetrons

The incoupling or launchers are available for all magnetrons, in waveguide sizes: R26/WR340/WG9A. For higher power levels however, the waveguide size is: R22/WR430.
Additional, versions are available, where the launcher and the isolator is combined, so-called **isolaunchers.**
Contact us for additional information.



Circulator with dedicated waterload for R22/WR430/WG9 waveguide.

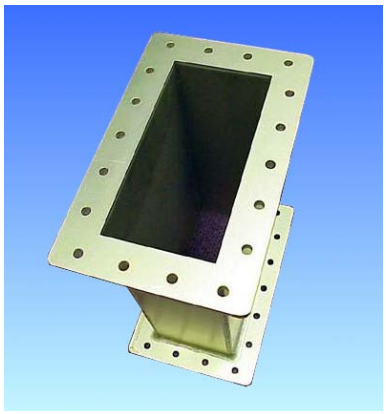
For applications for high power and waveguide R22, this circulator with separate water-load is available, only available in this waveguide size..
Isolation factor minimum:16dB, VSWR: 1.3.

Magnetron incoupling/launcher and electromagnet system

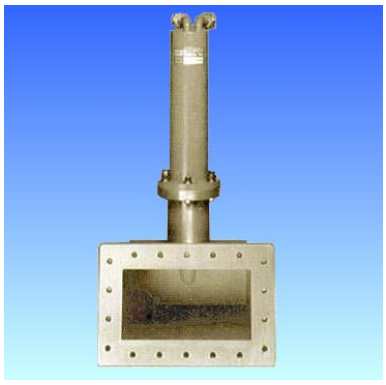
For high power at 2.45GHz, the standard waveguide is R22/WR340/WG9.
This launcher section, complete with the required electromagnet and filament connectors.
Available for 10, 15, 20 and 30kw magnetrons.
Also available as a complete designed magnetron-head.

For above magnetrons, the required power-supplies are available, as well. In inductive- and in switched mode power supply versions. Please contact us for additional information. Available in all three waveguides, like: R32/WR284/WG10, R26/WR340/WG9A and R22/WG430/WG9. Please contact us for additional information or specifications.
This overview, will be updated on a regular base.

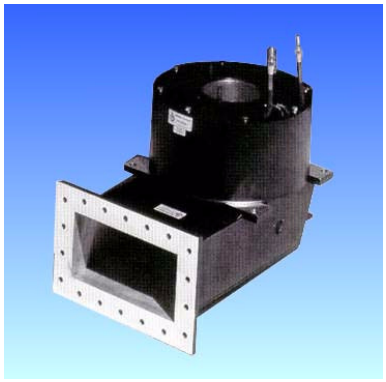
Waveguide components for 915MHz



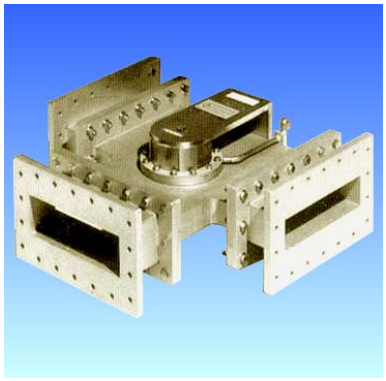
Waveguides in aluminium, in waveguide size: R9/WR975.
Waveguide systems in all required lengths and configurations are available. Standard material is aluminium, silver aludine plated. Flanges available, in WR975, standard or optional in British 8hole pattern. Available also as 90deg bends in E and in H plane, in waveguide WR975/R9. Bends in sweep and in miter version.



Waterload, waveguide size: R9/WR975
Waterload for isolators or as a matching absorber system. Power level up to 120kW at 915MHz available. Also for frequencies: 896 MHz or 920MHz.
VSWR:<1.05.



Magnetron launcher/incoupling system, complete with electromagnet and filament connectors
This incoupling/launcher section is available for all magnetron power levels, it will be supplied with all, required components like; launcher, electromagnet, pole-pieces, and filament connectors. All matched components for specific power-levels for the frequencies: 896, 915 and 920 MHz. Feasible for power levels from 5kW up to 120kW. Waveguide sixe:R9/WR975, in aluminium, silver aludine plated. Contact us for additional information.



Circulator for R9/WR975 waveguide
Circulator, for use in 915MHz systems, in R9/WR975 waveguide. From power level 5kW up to 120kW. For use with separate waterload. Isolation factor:> 20dB, VSWR<1.05. All circulators are equipped with water cooling at the ferrites. Also available for 896 and 920MHz.
These circulators are equipped with monitor connectors at port:1, and at port:3 for forward and reflected power measurements. Remark: Optionally measuring diodes and measuring amplifiers are available.
Please contact us for additional information.

Also available, tuners for 915MHz, sliding shorts, and all required waveguide components. For, all required applications, in heating and in plasma., for the required frequencies at: 915, 896 and 920MHz.

IBF Electronic GmbH & Co. KG
Dr.-Robert-Murjahn-Str.12, D-64372 Ober-Ramstadt / Germany, Tel: +49 (0)6154/5755-0, Fax: +49(0)6154/5755-20

Magnetron overview for 2450MHz, magnetrons

At picture:

Upper: Magnetron: 6kW, type nr:YJ1600
Left: Magnetron for 2kW, forced air-cooled, type nr: 2M259
Right: Magnetron for 300W, forced air-cooled, type nr: YJ1530SP
Down: Magnetron for 10kw, water-cooled, without electromagnet, type nr: CK-619

Magnetron	Performance	Cooling (alternative)	Magnet	I_f **(A)**	V_f **(V)**	I_a **(mA)**	I_{ap} **(mA)**	V_{ap} **(kV)**
YJ1530SP	300 W	Air	PM	11.5	3.4	150	150	3.00
YJ1511SP	300 W	Air	EM/PM	11.5	3.4	150	150	3.00
2M167 / 2M107	850 W	Air / water	PM	11.5	3.3	350	1200	4.10
NL10305	1050 W	Air	PM	13.5	3.4	350	1400	4.35
2M247	1050 W	Air / Water	PM	13.5	3.4	350	1400	4.35
YJ1540	1250 W	Air / Water	PM	14.0	4.4	400	1600	4.50
2M137	1250 W	Air	PM	14.0	4.4	400	1600	4.50
NL10254	1450 W	Air / Water	PM	14.0	4.6	450	1800	4.50
2M278 / 2M259 NL10250	2000 W	Air / Water	PM	19.0	4.6	800	2100	4.00
2M265 / 2M266 NL10230	3000 W	Water	PM	16.0	4.6	900	2650	5.40

Magnetron	**Performance**	**Cooling**	**Magnet**	I_{em} **(A)**	I_f **(A)**	V_f **(V)**	I_a **(mA)**	V_{ap} **(kV)**
CK-612	5000 W	Water	EM	4.0	42	7.5	1400	6.50
YJ1600	6000 W	Water	EM/PM	4.0	33	5.0	1150	7.20
CK-619	10000 W	Water	EM	3.2	47	10.0	1600	10.00
CWM-10S NL10245	10000 W	Water	EM	3.2	36	10.0	1600	10.00
CWM-15S NL15245	15000 W	Water	EM	3.6	47	10.0	1800	12.00
CWM-20S NL20245	20000 W	Water	EM	4.9	50	10.0	2100	14.50
CWM-30S NL30245	30000 W	Water	EM	6.0	66	6.4	3300	13.50

I_f	Heating current	V_f	Heating voltage
I_a	Mean anode current	I_{ap}	Anode peak current
V_{ap}	Anode peak voltage	I_{em}	Electromagnet electrical power

EM Equipped with an electromagnet.
PM Equipped with a permanent magnet.

On customers request, we are able to supply all magnetrons in special customized versions, like special water-cooling and special customised water connectors, or electromagnet versions, like special customised stability applications.

Please contact us for additional information.

Magnetron overview for 2450MHz, magnetrons

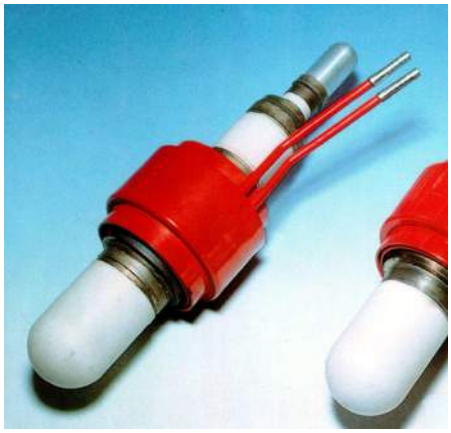
Type	Output Power Po(kW)	Filament Ef(V)	Filament If(A)	Anode Voltage Ebm(kVp)	Frequency Fo(MHz)	Anode Current Ib(mA)	Outline Dimensions W·D·H(mm)	Cooling ※2	Weight (kg)	Magnet
2M265	3.0	※1 4.0/(2.2)	22	5.1	2455	840	123×108×139	F.A	3.0	Ferrite
2M265WJ	3.0	※1 4.0/(2.2)	22	5.1	2455	840	123×100×139	W.C	3.6	Ferrite
2M266	3.0	※1 4.0/(2.2)	22	5.1	2455	840	123×108×116	F.A	1.9	Samarium Cobalt
2M266WJ	3.0	※1 4.0/(2.2)	22	5.1	2455	840	123×100×116	W.C	2.5	Samarium Cobalt
2M259	2.0	※1 4.6/(3.4)	20	4.0	2455	725	123×108×116	F.A	2.3	Ferrite
2M259WJ	2.0	※1 4.6/(3.4)	20	4.0	2455	725	123×100×116	W.C	2.9	Ferrite
2M262	1.5	※1 4.4/(3.7)	14	4.5	2455	480	100×80×105	F.A	1.2	Ferrite
2M262WJ	1.5	※1 4.4/(3.7)	14	4.5	2455	480	100×80×105	W.C	1.9	Ferrite
2M137	1.3	4.4	14	4.5	2455	400	100×80×105	F.A	1.2	Ferrite
2M244	1.0	3.15	10	4.35	2455	320	93×80×104	F.A	0.9	Ferrite
2M167B	0.9	3.3	10	4.1	2455	300	93×80×104	F.A	0.9	Ferrite

※1 Standby Voltage and Cut Back Voltage upon Oscillation
※2 F.A : Forced Air Cooling, W.C : Water Cooling

This overview, will be updated on a regular base.

Please contact us for additional information or specifications.

Magnetron overview for 915MHz, magnetrons



Magnetron 30 kW
type CK-611

Magnetron	Performance	Cooling	Mag-net	I_{em} **(A)**	I_f **(A)**	V_f **(V)**	I_a **(mA)**	I_{ap} **(mA)**	V_a **(kV)**
CK-147	5 kW	Water	EM	2.5	35	10.0	1300	<2000	6.5
NL10257	5 kW	Water	EM	2.3	35	10.0	1300	<1600	6.5
CK-611	30 kW	Water	EM	4.0	115	12.6	2600	<3000	14.0
CWM-30L NLM915-30	30 kW	Water	EM	4.2	112	12.6	3000	<4000	15.0
CWM-50L NLM915-50	50 kW	Water	EM	4.7	112	12.6	4000	<5000	17.0
CWM-60L NLM915-60	60 kW	Water	EM	5.0	112	12.6	4500	<5000	17.0
CWM-75L NLM915-75	75 kW	Water	EM	5.0	112	12.6	5000	<6000	17.0
CWM-100L NLM915-100	100 kW	Water	EM	5.0	112	12.6	6000	<7000	19.0

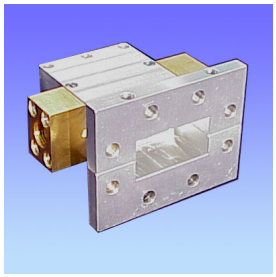
All above magnetrons are also available in 896 and 920MHz.
For customers with a dud magnetron, also rebuilt magnetrons are available.
Please contact us for additional information.

I_f Heating current
V_f Heating voltage
I_a Mean anode current
I_{ap} Anode peak current
V_a Anode voltage
V_{ap} Anode peak voltage
I_{em} Electromagnet current

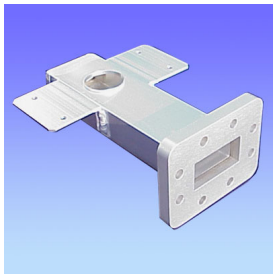
This overview, will be updated on a regular base.

Please contact us for additional information.

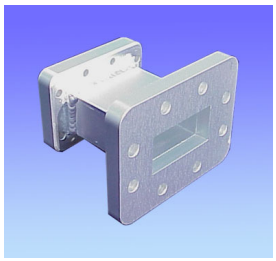
Waveguide and microwave components for 5.8GHz



Waterload, waveguide size: R58/WR153/WG13
Waterload for isolators or as a matching absorber system.



Incoupling/launchers systems
The incoupling or launchers are available for all magnetrons, in waveguide sizes: R58/WR153/WG13



Waveguide transitions R58/WR153/WG13
Transitions are available in standard and special flange types. Also available for rectangular to circular waveguides and to coaxial waveguide

Magnetron 5.8GHz, power level: 400/800W
Air-cooled magnetron for power levels 800W at continous wave mode. Also available with 400W cw output power.

Directional coupler 5.8GHz / R58/WR153/WG13 with „N“-connector
for measurement of microwave power with a power meter. Available with different attenuations

Directional coupler 5.8GHz / R58/WR153/WG13 with SMA-connector
for measurement of microwave power with an power meter. Available with different attenuations

Overview for electron power tubes

Tetrode 10 kW Triode
type 4CX10000D

500 W
type 3-500Z

Power Tetrode	Envelope	P_{out} (kW)	I_f (A)	V_f (V)	P_a (KW)	U_a (kV)	f (MHz)	Cooling
4 - 125A	Glass	0.37	6.8	5.0	0.12	3.0	110	Radiation +compr. air
4 - 250A	Glass	1.00	14.5	5.0	0.25	4.0	110	Radiation +compr. air
4 - 400A	Glass	1.10	14.5	5.0	0.40	4.0	110	Radiation +compr. air
4X500A	Glass-Met.	0.48	13.5	5.0	0.50	4.0	220	Compr. air
4CX250B	Cer.-Met.	0.39	2.6	6.0	0.25	2.0	500	Compr. Air
4CX350A	Cer.-Met.	0.38	2.9	6.0	0.35	2.5	110	Compr. Air
4CX1500B	Cer.-Met.	1.10	10.0	6.0	1.50	3.0	110	Compr. Air
4CX5000A	Cer.-Met.	16.0	75	7.5	5.00	7.5	100	Compr. Air
4CX10000D	Cer.-Met.	16.0	75	7.5	10.00	7.5	110	Compr. Air
4CX15000A	Cer.-Met.	36.5	160	6.3	15.00	10.0	110	Compr. Air
4CX35000C	Cer.-Met.	110	295	10.0	35.00	20.0	30	Compr. Air

Power Triode	Case	P_{out} (kW)	I_f (A)	V_f (V)	P_a (KW)	U_a (kV)	f (MHz)	Cooling
3-500Z	Glass	0.85	14.4	5.0	0.50	4.0	110	Radiation + compr. air
TB4/1250	Glass	1.69	9.9	10	0.45	4.0	100	Radiation + compr. Air
3CX1500A7	Cer.-met.	2.60	10.5	5.0	1.50	4.0	250	compr. Air
TB5/2500	Glass	2.73	32.5	6.3	0.80	6.0	50	Radiation +compr.Air
RS3010CL	Glass-met	5.00	70.0	6.3	5.00	7.0	110	compr.Air
3CX10000A3	Ker.-Met.	12.40	99.0	7.5	10.00	7.0	160	compr. Air
3CX10000H3	Ker.-Met.	12.40	99.0	7.5	10.00	7.0	90	compr. Air

P_{out}	Output power	I_f	Heating current
V_f	Heating voltage	P_a	Anode dissipation
U_a	Anode voltage	f	max. application frequency

Forced air-cooling: Please contact us for additional information, on chimney's and cooling fans. For all above electron tubes, sockets, anode connectors, pedestals, grid connectors etc. are also available.

Please contact us for additional information.

Overview of directional couplers, directional detectors and measuring diodes for 2.45 GHz

Directional Detector

Two-Stubs-Coupler

Microwave Detector

A.	**Microwave Detectors**	**Connectors**	**Attenuation**	**Diodes**	**Speed**
	IDM211N/BNC	NM / BNCF		Zero-Bias Schottky	Standard
	IDM511N/BNC	NM / BNCF		Zero-Bias Schottky	Standard
	IDM212N/BNC	NM / BNCF		Tunnel-Diode	fast
B.	**Directional Coupler**				
	Loop Coupler		**P_{out} = 100mW (1W)**		
	DC 114 N	R26 / NF	50, 60, 70 dB	---	
	DC 114 SMA	R26 / SMAF	50, 60, 70 dB	---	
	DC 123 N	R26 / NF	60 dB	---	
	DC 123 SMA	R26 / SMAF	60 dB	---	
	DC 132 N	R26 / NF	60 dB	---	
	DC 132 SMA	R26 / SMAF	60 dB	---	
	Two-Stubs Coupler		**P_{out} = 10mW (100mW)**		
	DC 113 N	R26 / NF	20 – 70 dB	---	
	DC 113 SMA	R26 / SMAF	20 – 60 dB	---	
	DC 211 N	R9 / NF	40 – 80 dB	---	
	DC 211 SMA	R9 / SMAF	40 – 80 dB	---	
	Dual Two-Stubs Coupler		**P_{out} = 10mW (100mW)**		
	DC 113 D N	R26 / 2x NF	20 – 70 dB	---	
	DC 113 D SMA	R26 / 2x SMAF	20 – 70 dB	---	
C.	**Directional Detectors**				
	DD 111	R26 / SMAF	---	Tunnel-Diode	fast
	DD 112	R26 / SMAF	---	Zero-Bias Schottky	standard
	DD 121	R32 / SMAF	---	Tunnel-Diode	fast
	DD 122	R32 / SMAF	---	Zero-Bias Schottky	standard
	DD 132	R22 / SMAF	---	Tunnel-Diode	fast
	DD 131	R22 / SMAF	---	Zero-Bias Schottky	standard

NF N Connector Female
NM N Connector Male
SMAF SMA Connector Female
BNCF BNC Connector Female

Remarks:

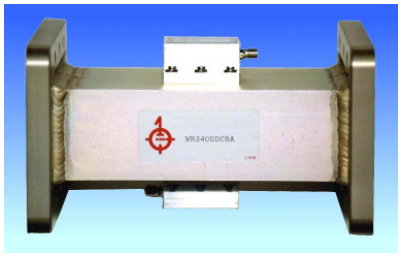
Table A. Microwave measuring diodes: Also, can be used at frequencies of: 915, 896 and 920 MHz. Available with “N” and or SMA connector. Please contact us for additional information.

Table B. For directional couplers, we have available the required measuring diodes, See also Table: A. High directivity, attenuation available in several values., with “N” or SMA connectors.

Table C. Directional detectors, are directional couplers with integrated measuring diode and internal 50ohm impedance matching network. The output is in –voltage, non linear to the power, due to the non linear behaviour of the diodes. Diodes also available in standard versions.
We have in the program, amplifiers , microprocessor controlled to linearize the output voltage, proportional to the measured microwave power. Also available the required amplifiers and measuring monitors.

Contact us for additional information. Above matrix, will be updated on a regular base.

Overview of directional couplers, directional detectors and measuring diodes for 2.45 GHz., mounted onto waveguides



R26 / WR340 Double Directional Coupler

D.	Linear Power Detectors (development)	Connectors	Attenuation	Diodes	Speed
	Microwave Linear Power Detector				
	DM 311	NM / 4Pin	---	SmartLoad	slow
	Linear Directional Power Detector				
	R9, R22, R26, R32		---	SmartLoad	slow
	Dual Linear Directional Power Detector				
	R9, R22, R26, R32		---	SmartLoad	slow
	Triple Linear Drectional Power Detector				
	R9, R22, R26, R32		---	SmartLoad	slow

Table D. diodes: Internal 50 Ohm load.

NF	N Connector Female	SMAF	SMA Connector Female
NM	N Connector Male	BNCF	BNC Connector Female

All directional detector and directional coupler can be supplied mounted on a standard waveguide section, or on customers application, a customized waveguide. All waveguide size are feasible, like R32/WR284/WG9, R26/WR340/WG9A, R22/WR430/WG9, and R9/WR975. Also all lengths and configurations are available. Also available as complete power measuring unit for forward and reflected power. Meters are mounted into a cabinet, with microprocessor control for linear readings. Completely calibrated. Dot matrix display unit. Internal settings for customized calibration on the spot. Available in complete, stand alone, housing or as Din rail mount for mounting into cabinets for easy connecting and mounting.

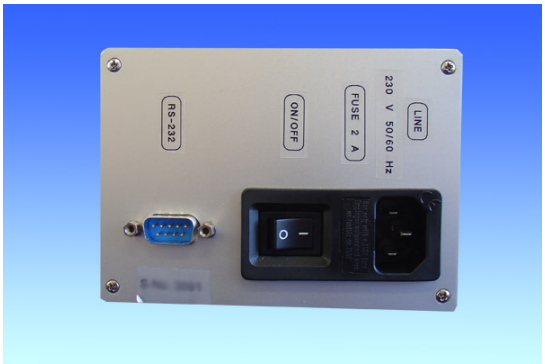
Above program is updated on a regular base. Contact us for any additional required information.

Microwave measuring systems

MW-POWER-BOX-LCD

Measuring system for indication of forward and reflected microwave power.
Negative blue LC-display (white foreground, blue background). For measuring of voltage, provided by a microwave detector. Microwave detectors are connected to system via BNC connector on backside. Correction of detector's nonlinearity. RS232 interface for calibration and status. Input voltage 0 – 200mV.
Line voltage: 100 – 240 Vac, 50/60Hz.

MW-POWER-BOX-LO

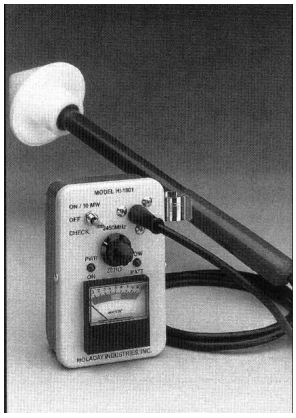


Technical enviroment like as MW-POWER-BOX-LCD, but without LC-display. Acutal forward and reflected power are scaled to 0 .. 10V voltage range and provided on interface for further handling.

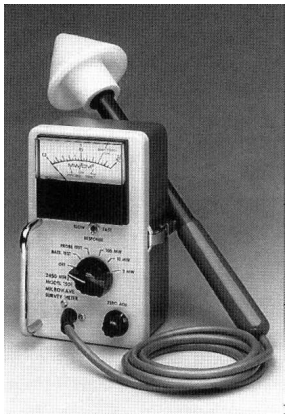
This overview, will be updated on a regular base.

Please contact us for additional information or specifications.

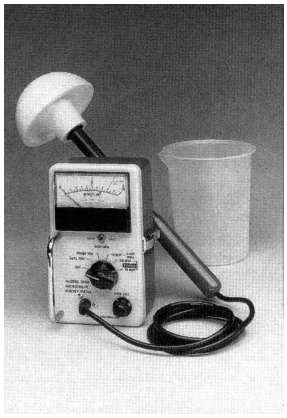
Overview of microwave leakage detectors and radiation meters



HI-1801



HI-1501



HI-1600

Specifications:

Model HI-1801	Model HI-1501	Model HI-1600
Calibrated at 2450 MHz	Calibrated at 2450 MHz	Calibrated at 915 MHz and 2450 MHz
Ranges: 0 – 10 mW/cm^2	Ranges: 0–2, 0–10, 0-100 mW/cm^2	Three ranges: 0 – 10 mW/cm^2 at 2450 MHz, 0-10 and 0-20 mW/cm^2 at 915 MHz
Accuracy: +/- 1 dB	Accuracy: +/- 1 dB (0-2 and 0-10 scales)	Accuracy: +/- 1 dB
Maximum power density: Continuous 2 W/cm^2	Maximum power density: Continuous 2 W/cm^2	Maximum power density: Continuous 2 W/cm^2

Proposal: Matrix: Add the MLT 441/MLT442 meters from Hoer in Berlin.
As, a 4 input monitor, specially designed for the use, in continuous industrial microwave equipment. Meters are CE approved, come with calibration certificate.

For safety for persons and also compute equipment, the use for a leakage meter is mandatory.

For personal protection, we strongly recommend the use of , minimum, the model: HI-1801, per microwave machine system.

All above meters, are in agreement with the guidelines for microwave ovens DIN 0848 part 2, from January 1991 at 5mW/cm2.

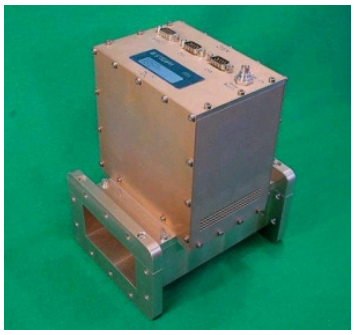
Contact us for additional information or specifications on above meters.

“HOT” measuring system.

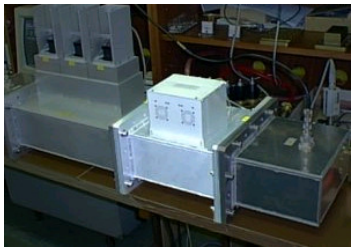
Vector coefficient measuring system. Mounted on a waveguide.
All required waveguides are available. Available for all power levels and all frequencies. The “HOT” measurement system is a vector measuring system, which will be connected between the isolator and the application. It will supply all required information on the microwave parameters, required to understand the load-matching or impedance figures of the typical application.
This system can be extended with an automatic tuning system.
This to add an tuning-system, which will not have to test if the tuning is ok, but due to the internal calculations by the microprocessor programming, the tuner is programmed to set exactly the max. load-matching, so tuning always is optimal.

KEY FEATURES

Measures All Important Quantities…
…and More
Full-Power On-Line Measurement
High Accuracy, High Dynamic Range
Compact Design
Intelligence Inside
RS-232 Interface to External Controller
Windows Control, Visualisation and Data Logging Software
Drives Autotuning System



2.45 GHz Version



915 MHz Version

BASIC FEATURES

Primarily measured quantities:
Reflection coefficient (magnitude and phase)
Incident power
Frequency
Internal temperature for accuracy enhancement
Measurement under full-power operating conditions
20 dB dynamic range of working power
WR340, WR430, WR284, WR975 waveguide interface for the 2.45GHz and the 915Mhz ISM band contains single board computer for fast data acquisition and processing. Integrates easily into existing computer-based instrumentation and monitoring systems. In conjunction with the Three Stub Tuner, enables automatic impedance matching of time varying loads.

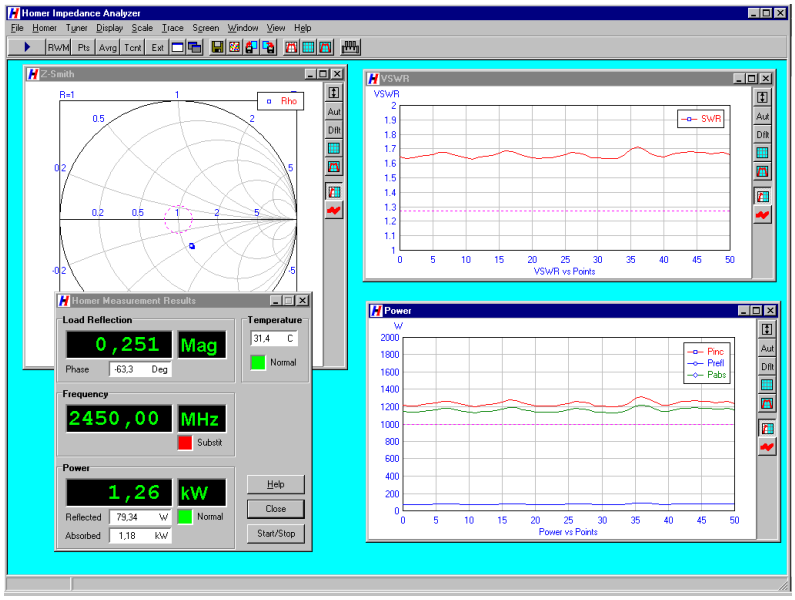
SOFTWARE FEATURES

Microsoft Windows® environment
Display formats:
Magnitude and phase of reflection coefficient
Return loss, VSWR
Incident, reflected and absorbed powers (in watts or dB)
Polar diagram, Smith chart, Rieke diagram
Simultaneous display in various formats as well as numerically
Unlimited data logging of all quantities of interest
Extensive on-line help

V1.5 SPECIFICATIONS

Remark: data are only for max. 30kW at 2.45GHz system

Electrical	
Waveguide type	R-26 (WR-340, WG-9A)
Frequency range	2425 to 2475 MHz
Dynamic range[1)]	20 dB
Minimum working power	1 W
Maximum working power	30 kW
Reflection coefficient measurement error (uncertainty circle radius)	0.05
Incident power measurement error (matched load)	±5 %
Power supply voltage	24 V±10% DC
Power consumption	18 W
Mechanical	
Length	260 mm (10.24 in)
Width	143 mm (5.63 in)
Height	163 mm (6.42 in)
Mass	3.8 kg
Environmental	
Operating temperature range	+5 to +55 Celsius
Storage temperature range	-10 to +125 Celsius

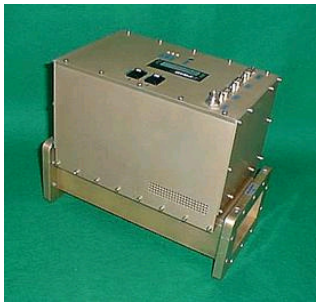


The maximum power range should be mentioned at the ordering. This to keep the sensitivity of the system optimal. The max. power range for 2.45GHz, is set for 30kW. Please mention on order the max. required power. For 915MHz, the max. power level is set at 120kW. Please mention the required power at the order.
The actual minimum operating power is now set for 20dB less or 1W, which ever is greater.

Contact us for any additional information. Available in all suitable waveguide sizes, like: R32/WR284/WG10, R26/WR340/WG9A, R22/WG430/WR8 or R9/WG975 for 915, 896 or 920 MHz

Automatic Impedance Matching System (ECO-Tuner)

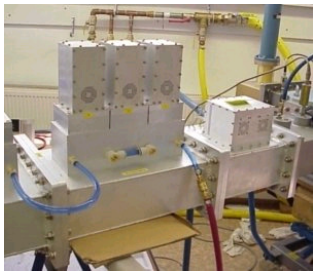
KEY FEATURES



2.45 GHz Version

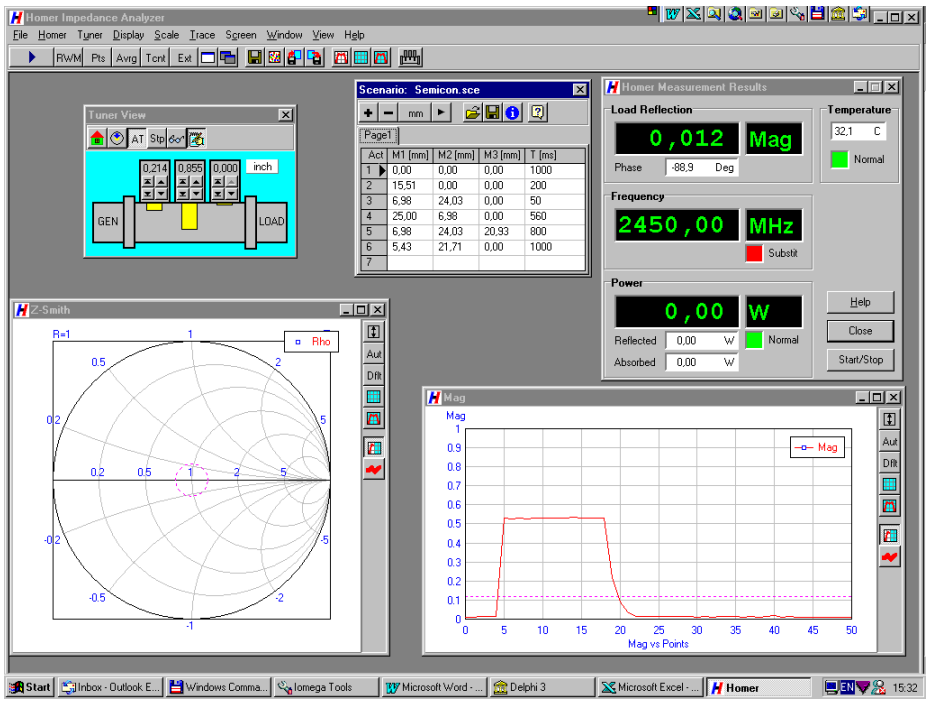
Fully automatic and computerized three stub tuning system.
Integrated the hot measuring system(Impedance analyzer) with an automatic three stub tuning system.
Accurate and fast automatic matching of steady or varying loads.
Autonomous or PC controlled operation. RS232 and CAN-bus interface to external controller. Windows control, visualisation and data logging software, available optionally.

BASIC FEATURES



915 MHz Version

During the tuning procedures, full operating power monitoring of reflection, frequency and power, all in compact design.
Fully equipped for all types of power supplies, like LC, DC/low ripple or high ripple power supplies and pulsed systems.
Response time, from approx: 1 second to full 6 seconds, for full move for all stubs from minimum to maximum position, all depending to the, to the level of mismatch. Waveguide systems from R32 to full R9.
Frequencies, from 2,45GHz to 915MHz, alternatively: 896MHz and 922MHz.
Can be easily integrated into an existing computer control and or monitor system.
A VSWR within VSWR:<= 10, can be controlled to matched load conditions.
A VSWR of the value of approx:30 can be controlled down to VSWR.5.



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V1.6 SPECIFICATIONS

Remark: all data are only for the R26 version

Electrical	
Waveguide type	R-26 (WR-340, WG-9A)
Frequency range	2425 to 2475 MHz
Dynamic range[1)]	20 dB
Minimum working power	1 W
Maximum working power	30 kW
Reflection coefficient measurement error (uncertainty circle radius)	0.05
Incident power measurement error (matched load)	±5 %
Tuning range[2)]	VSWR < 10:1
Tuning accuracy (reflected-to-incident power ratio)	1 %
Power supply voltage	24 V±10% DC
Power consumption (all stubs moving)	45 W
Power consumption (stubs resting)	30 W
Mechanical	
Length	260 mm (10.24 in)
Width	138 mm (5.45 in)
Height	226 mm (8.90 in)
Mass	6 kg
Environmental	
Operating temperature range	+5 to +55 Celsius
Storage temperature range	-10 to +125 Celsius

1) Actual maximum operating power is fixed according to customer's demand not to exceed 30 kW. Actual minimum operating power is then 20 dB less or 1 W, whichever is greater.

2) Generally, the match is improved for loads outside of the tuning range (e.g. VSWR=30 drops below 5).

Coax adaptors and connectors

Manufacturers: Radial, Telegaertner and NN

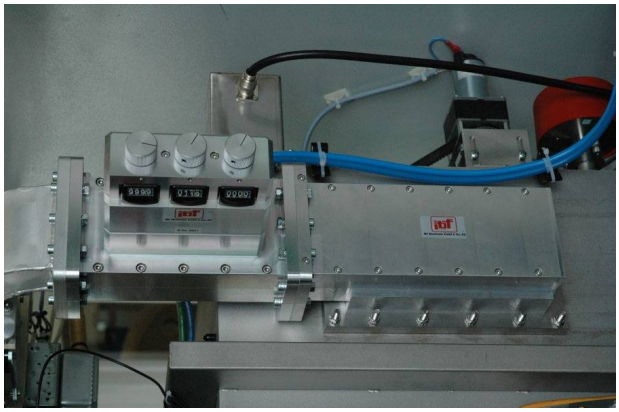
Type	Remark (only Manufacturer of proprietary goods)
Adaptor from: BNC PL to SMA PL	Gold plated
Adaptor from: BNC JA to SMA PL	Gold plated
Adaptor from: BNC PL to SMA JA	Gold plated
Adaptor from: BNC JA to SMA JA	
Adaptor from: N PL to SMA JA	Gold plated
Adaptor from: N JA to SMA PL	Gold plated
Adaptor from: N PL to SMA JA	Gold plated
Adaptor from: N JA to SMA JA	Gold plated
Adaptor from: BNC PL to N PL	
Adaptor from: BNC PL to N PL	
Adaptor from: BNC JA to N PL	
Adaptor from: BNC JA to N JA	
Adaptor from: 7/16 JA to N PL	Gold plated
Adaptor from: 7/16 PL to N PL	Gold plated
Adaptor from: 7/16 PL to N JA	Gold plated
Adaptor from: 7/16 JA to N Kup	Gold plated
corner 90° from: BNC PL to BNC JA	
corner 90° from: SMA PL to SMA JA	Gold plated
corner 90° from: N PL to N JA	
Connector from: BNC PL to BNC PL	
Connector from: BNC JA to BNC JA	
Connector from: SMA PL to SMA PL	Gold plated
Connector from: SMA JA to SMA JA	Gold plated
Connector from: N PL to N PL	
Connector from: N JA to N JA	
Connector from: 7/16 PL to 7/16 PL	Gold plated
Connector from: 7/16 PL to 7/16 JA	Gold plated
Pipe-Tee from: BNC JA to 2x BNC JA	
Pipe-Tee from: BNC PL to 2x BNC JA	
Pipe-Tee from: SMA JA to 2x SMA JA	Gold plated
Pipe-Tee from: SMA PL to 2x SMA JA	Gold plated
Pipe-Tee from: N JA to 2x N JA	
Pipe-Tee from: N PL to 2x N JA	

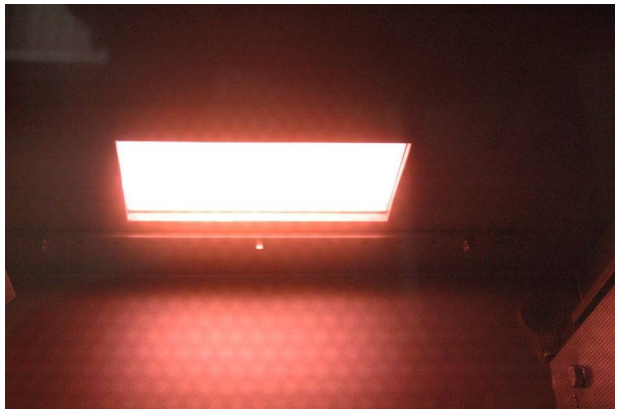
PL plug
JA jack

Above overview will be update on a regular base.
Please contact us for any additional information or data sheet.

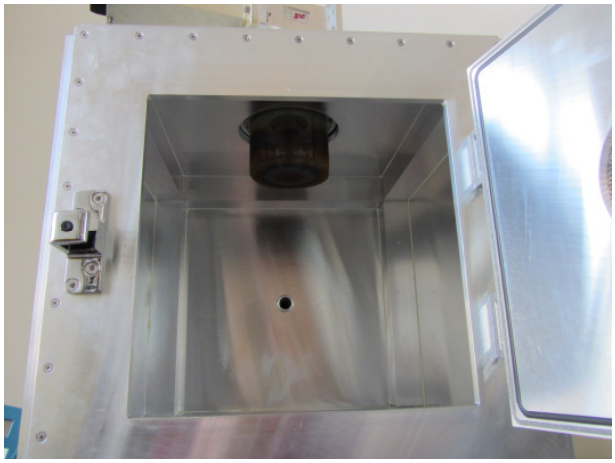
Microwave plasma sources

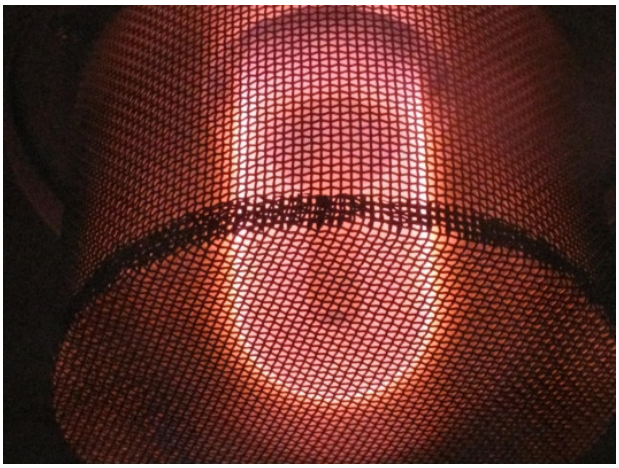
Plasma source to the refitting or expansion of a plant with RF-source

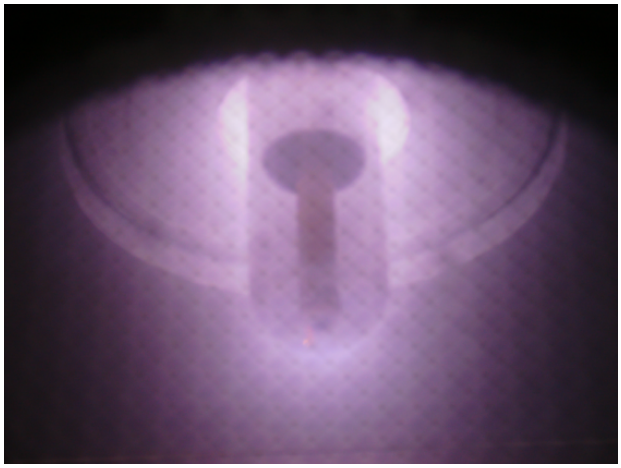


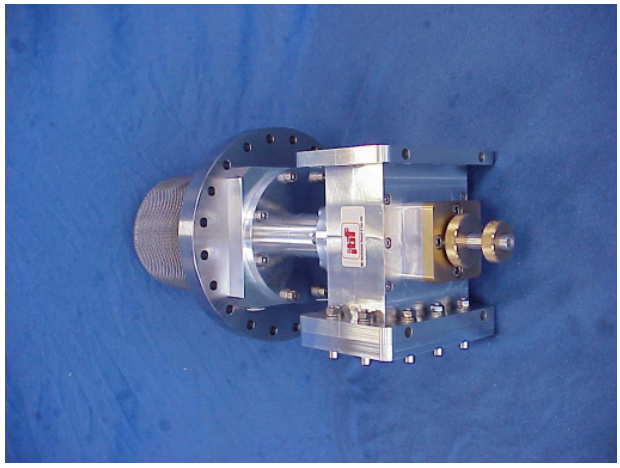


Cheap plasma source for the cleaning, activation and coating also as ion source convertible



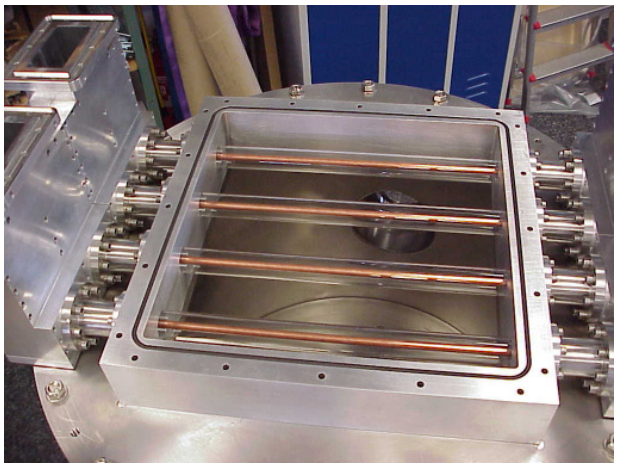


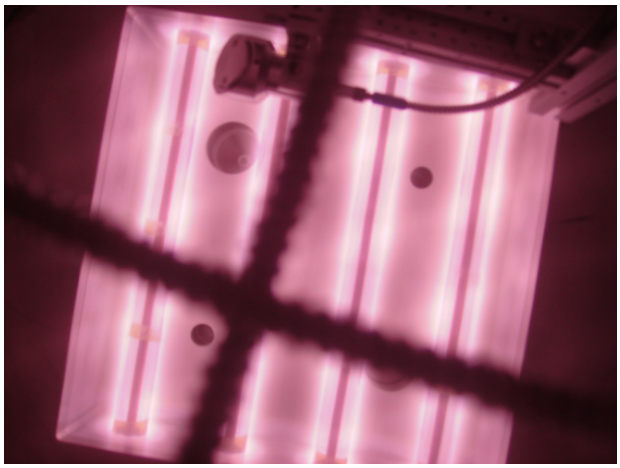


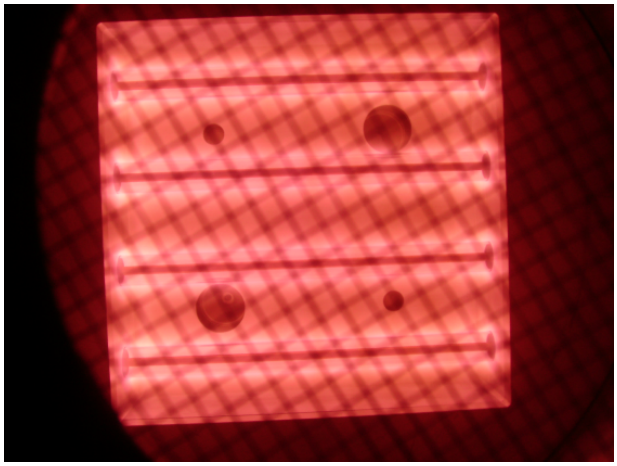


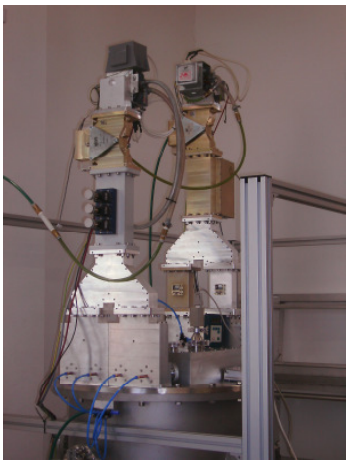
Contact us for additional information or specifications
info@ibf-electronic.de

Array plasma source, in the size scalable after customer wish









Linear plasma source, after customer wish in the length up to 3 meters scalable

Contact us for additional information or specifications
info@ibf-electronic.de