



# HYBRID SYSTEMS AND COGENERATION PLANTS



POWER GENERATING SYSTEMS WITH INDIVIDUAL SOLUTIONS



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R.I.D. GmbH is a fast growing German company that offers customer fit solutions, situated in Kirchartd (Germany). Many years of experience in the Power Generation technology. More than 200 well known companies worldwide buying and using high quality equipment made by RID.

Company R.I.D. GmbH develops, manufactures and supplies:

- Diesel gensets (in power range 8 to 2000 kVA)
- Portable gensets (ranging from 2 to 15 kVA)
- Power system with alternative energy sources
- Power Generating Systems 48 V DC for telecommunication equipment
- Self developed monitoring systems
- Gas generators
- Cogeneration plants (diesel and gas)



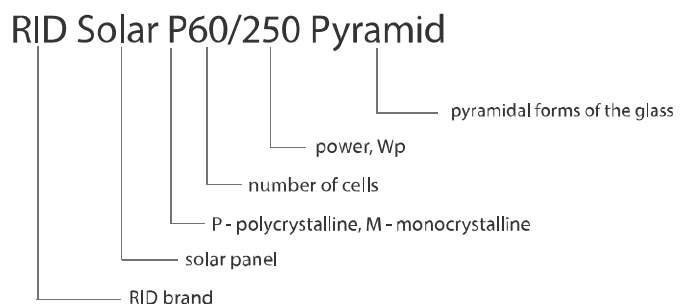
Our company stands for competence, expert knowledge, high-quality solutions and fast implementation of customer projects. With a sustainable support and long-term cooperation, the company develops for its customers with additional sales opportunities for our products and define the relevant target groups. Quality management standard, design, production and service match the standard of ISO 9001:2008 norm. All RID power plants are certified for telecommunication.

### PREMIUM GENSETS

- Extended warranty (2 years)
- Extended maintenance interval-saving operating costs warranty.
- Aluminum tank allowed 60 hours operation
- Exhaust pipe with 3-chamber performance reduces noise up to 35 dB (A)
- Double layer special powder coating (corrosion protection for 10 years)
- Fasteners stainless steel ensures reliable operation and long life
- The possibility of design changes on request

### DESIGNATION GENERATORS

S-SERIES	Gensets with Deutz Engines
E-SERIES	Gensets with Mitsubishi Engines
G-SERIES	Gensets with MTU Engines
B-SERIES	Gensets with Doosan Engines
C-SERIES	Gensets with Iveco Engines
P-SERIES	Gensets with Perkins Engines





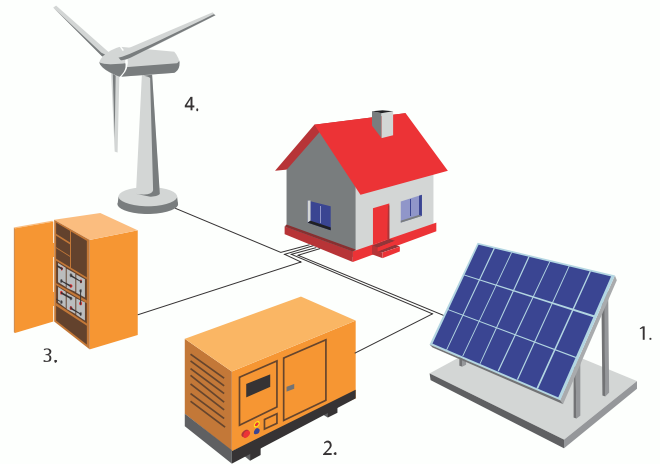
# Hybrid Systems for independent Power Supply 48V DC/AC

## Advantages:

- Voltage 48-56 volt
- Current from 50 to 250 A
- Mobile or container version
- Monitoring and control via computer or via mobile phone network GSM / GPRS / Ethernet
- Cost savings of fuel and maintenance
- Diesel Gensets have 1000 to 1800 RPM
- The systems are ideal for remote regions that do not have a grid power

Hybrid systems consist of independent power supply components which include: solar panels, wind generators, power generators, batteries pack and the cabinet with the control system.

# Do you still use public power grid?



## Be independent with RID Hybrid Systems

### Alternative Energy combined with Emergency Power Technic

The electricity costs in recent years have increased significantly. Due to this increase many electricity consumers ask themselves how they could become independent from public power grids. On emergency cases diesel generators are often used. But to use diesel generator only for power generation would not be economical. For this reason we offer a solution where alternative energy in combination with emergency power technics can be used. Our hybrid systems usually consist of a number of components such as: solar panels, wind generators, diesel generators, battery storage and control cabinet.

### Reliable energy supply

The solar modules generate electricity as long as the sunlight is available. Use of photovoltaic lowers significantly diesel generator fuel consumption. Wind generator does not need sunlight and it can still produce energy at night on bad weather conditions.

The whole system is centrally monitored and controlled. In absence of sunlight and wind the control system automatically starts a gas or diesel generator so that uninterrupted supply of energy at home is guaranteed.

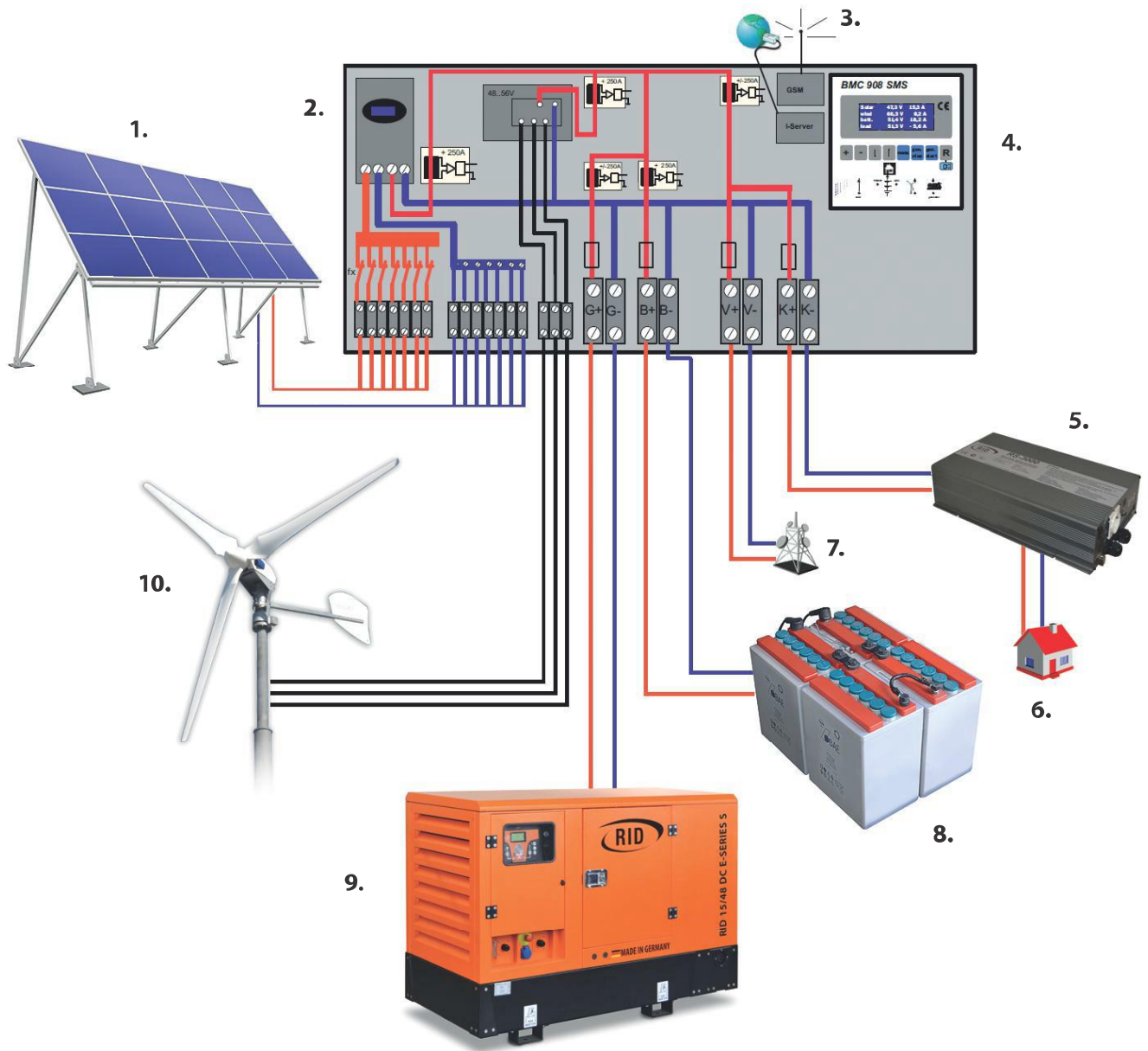
Our services range from small hybrid systems with battery storage to industrial plants. Our system allows larger power consumers such as schools, hotels and hospitals to have a continuously and uninterrupted supply of energy.







### Circuit of Components Connecting



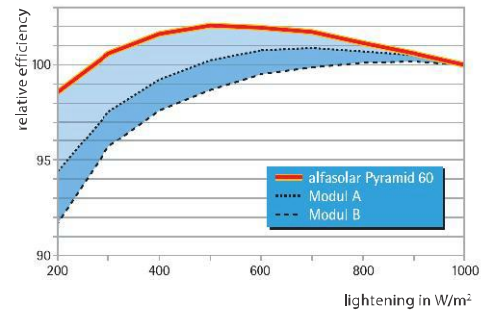
- 1. Solar panels
- 2. Control of battery charging = battery charge controller
- 3. Modul of transmission / reception (IP-server and GSM-modem)
- 4. Controller RID-BMC 908
- 5. Inverter DC / AC
- 6. Consumers 230 V AC = load
- 7. Consumers 48 V DC = load
- 8. Battery pack
- 9. Genset
- 10. Wind generator



## Photovoltaic Systems

### Polycrystalline and monocrystalline solar panels

We offer complete German manufactured solar systems. The new RID solar panels combines the advantages of high efficiency polycrystalline cells with the output properties of the pyramidal surface. Developed with the help of modern technology of our company, efficiency of solar panels is increased up to 20% more than in the solar modules from other manufacturers. Life time of our solar modules is more than 25 years.



**RID Solar P60/250 Pyramid**  
Polycrystalline cells with high stability and reliability. Efficiency up to 17%



**RID Solar M60/260 Pyramid**  
Monocrystalline cells with high productive and are very stable. Efficiency up to 20%.



pyramidal form of cells

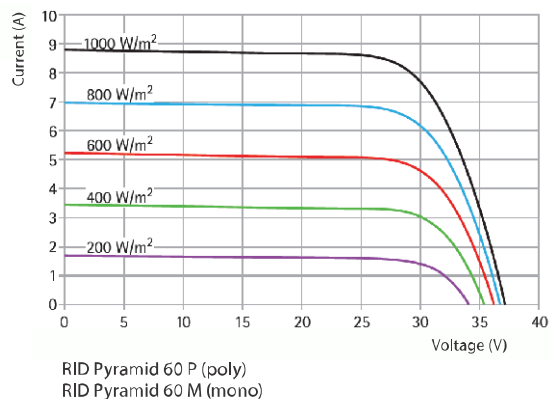
### TECHNICAL DATA

Type		RID Solar P60/250 Pyramid	RID Solar P60/260 Pyramid	RID Solar M60/260 Pyramid	RID Solar M60/270 Pyramid
Order number		761004	761017	761018	761020
Efficiency	%	to 18	to 18	16,3	16,3
Max. power	$P_{MAX}$ (Wp)	250	260	260	270
Short circuit current	$I_{SC}$ (A)	8,75	8,87	8,81	8,91
Max. current	$I_{MPP}$ (A)	8,22	8,42	8,42	8,68
No-load voltage	V	37,73	38,19	38,09	38,43
Nom. voltage	$U_{mpp}$ (V)	30,45	30,95	30,91	31,15
Plus tolerance ( $P_{flash} > P_{max}$ )	$P_{flash} > P_{max}$	-0/+5 Wp	-0/+5 Wp	-0/+5 Wp	-0/+5 Wp
Allowable temperatures of modules	%	-50 до +85°C	-50 до +85°C	-40 до +85°C	-40 до +85°C
Max. system voltage	V	1000	1000	1000	1000
Number of cells	TK (PMPP)	60 polycrystalline	60 polycrystalline	60 monocrystalline	60 monocrystalline
Dimensions	mm	1623 x 986 x 35	1623 x 986 x 35	1623 x 986 x 35	1623 x 986 x 35
snow load	N/m²	in frame: 5400 Pa = 550 kg/m2			

#### Advantages:

- The highest efficiency of 15.3%
- The pyramidal form of a coating increases the efficiency of solar panels by 5%.
- Optimum performance in low hit sunlight through special cells
- Long-life modules from stable glass and aluminum frame
- Glass edge are protected with silicone steady to UV rays

#### U-I characteristics of mono- and polycrystalline panels with different radiation







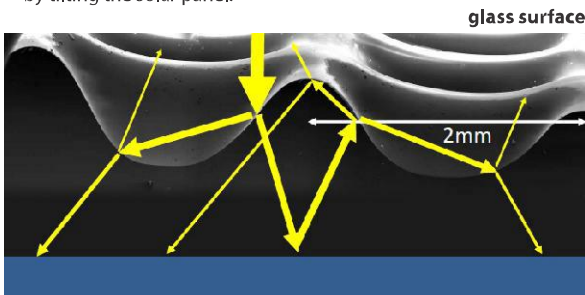
# Components of Hybrid Systems



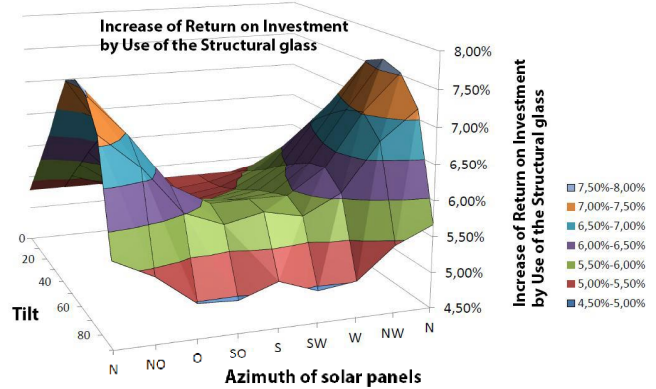
## Special glass for maximum efficiency

Used glass from company Saint Gobain is designated *Albarino P* and gives the panel the following advantages:

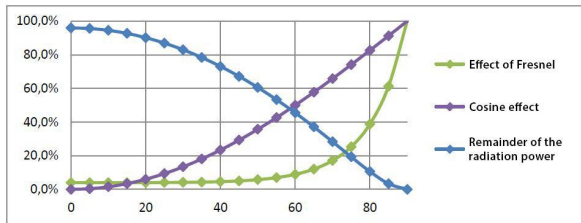
- Light-trapping by the perpendicular hitting light
- Decreased angle of light incidence reduces the effect of Fresnel by tilting the solar panel.



## Increase of return on investment of solar panels

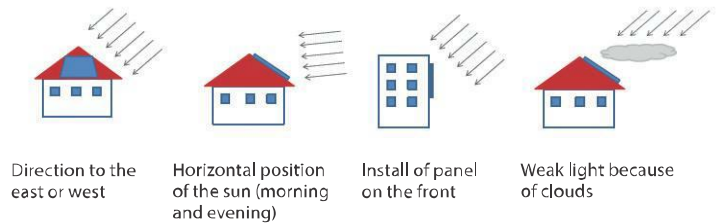


## Loss of Light Radiation and the Loss of Power



Due to the special glass *Albarino P* increases efficiency at hit sunlight at an angle of 40° to 70°.

## Factors affecting efficiency (weak sunlight and sloped light)



## Mounting Systems for Solar Panels

Through the use of concrete into the open space the systems can virtually be installed on any surface. When planning the installation, we put great importance to the stability of the structure. The RID allow mounting systems easy to install and adjust automatically. We offer mounting racks for solar modules according to individual wishes and ideas.

TECHNICAL DATA	
Order number	761057
Konfiguration	3 rows x 7 panels / 2 rows x 14 panels
Height	1400 mm
Material	Mounting set of profiles for module support: Special S-Series production from aluminum Bonding of aluminum Special manufacturing BF series. Aluminum frame RHP Bolts A2 - 70 / A4 - 80
Foundation	Concrete (calculations must be performed by a qualified Statics-Specialst on site)
Static	In accordance with the relevant rules, specific for each country (in Germany DIN 1055/EC 1). For calculating the statics of the Foundation depends on the wind and snow load.





Monocrystalline Innoframe cells



Monocrystalline black cells

TECHNICAL DATA			
Type		RID Solar M60/265 L	RID Solar MB60/255 L
Order number		761006	761009
Rated power	$P_{MAX}$ (Wp)	265	255
Plus tolerance (Pflash > Pmax)	W	0/+5	0/+5
Nom. voltage	$U_{mpp}$ (V)	30,85	30,95
No-load voltage	V	37,10	38
Max. current	$I_{WPP}$ (A)	8,60	8,25
Short circuit current	$I_{sc}$ (A)	9,20	8,80
Efficiency	%	15,9	15,3
Number of cells	pc	60	60
Max. system voltage	V	1000	1000
Reverse current	A	17	17
Temperature coefficient of power	$T_k$ ( $P_{MPP}$ )	- 0,47 %/K	- 0,45 %/K
Front cover		Special hardened low-iron glass with anti-reflex coating; glare reduced to a minimum	
Panel connection		Junction box with 3 bypass diodes, 2 x approx. 1 m solar cable, Ø 4 mm <sup>2</sup> , plug connector, IP 68, Solarlok PV4	
Snow load*		innoframe framed: 5400 Pa = 550 kg/m <sup>2</sup>	



Polycrystalline innoframe cells



XM Monocrystalline black cells

TECHNICAL DATA			
Type		RID Solar P60/255 L	RID Solar MB60/205 XM
Order number		761005	761038
Rated power	$P_{MAX}$ (Wp)	255	205
Plus tolerance (Pflash > Pmax)	W	0/+5	0/+5
Nom. voltage	$U_{mpp}$ (V)	30,02	25,35
No-load voltage	V	37,65	30,25
Max. current	A	8,50	8,10
Short circuit current	A	8,90	8,72
Efficiency	%	14,7	14,8
Number of cells	pcs	60	48
Max. system voltage	V	1000	1000
Reverse current	A	17	17
Temperature coefficient of power	$T_k$ ( $P_{MPP}$ )	- 0,45 %/K	- 0,47 %/K
Front cover		Special hardened low-iron glass with anti-reflex coating; glare reduced to a minimum	
Panel connection		Junction box with 3 bypass diodes, 2 x approx. 1 m solar cable, Ø 4 mm <sup>2</sup> , plug connector, IP 68, Solarlok PV4	
Snow load*		innoframe framed: 5400 Pa = 550 kg/m <sup>2</sup>	

\*The load was tested according to EN IEC 61215 (ed. 2), by following the instructions for installation and operation.



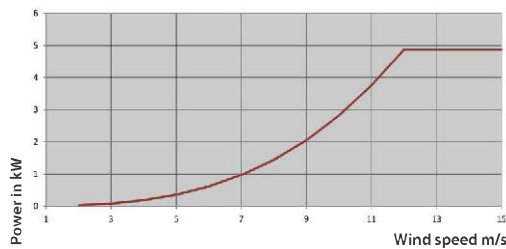
# Components of Hybrid Systems



## Small Wind Generators AC and DC



Diagramma of Power tTurbines RID WG-3500 B



- Wind generator series with power range 1 - 9.5 kVA
- Rated voltage 24 or 48 V DC
- Diameter of the wind turbine blades 3 - 7.5 m
- Allowable wind load up to 58 m/c
- Low noise level
- protection class IP 56

Wind generators RID WG series already produce electricity at a wind speed of 2.5 m/s. The control cabinet is equipped with 3-phase voltage controller, rectifier and brake resistor 3.5 kW. Special inverters ensure optimum power control and high efficiency of power conversion. Speed control may be steered by means of microprocessor or by the inclination be arbitrarily. Direction of the wind is determined by the wind direction sensor. Braking of the wind generator is through disc brake short circuit or manual shutdown.

The wind generators RID WG series are characterized by a favorable price-performance ratio. The strong and sturdy construction is perfect for stormy dangerous areas. The assembly and installation of the wind power plant can be quickly and easily performed.

### TECHNICAL DATA

Type		RID WG-2500	RID WG-3500 B	RID WG-6000
Order number		on request	700033	on request
Nom. output	W	2500	3500	6000
Max. output (at 450 rpm and 330 V DC)	W	2700	3700	7500
Nom. wind speed	m/sec.	12 to 58	12 to 58	12,5 to 58
Start wind speed	pcs	2,5	2,5	1,8
Nom. voltage AC	V	from 0 to 400	from 0 to 1000	from 0 to 1000
Home energy output	rpm	145	100	87
Braking resistance	kW	3	3,5	6,5
Noise level (by wind speed 15 m/sec)	dB(A)	65	65	65
Weight (without mast)	kg	30	31	87
diameter of the rotor	m	3	3,5	5,3
The overlapping area of the rotor	m <sup>2</sup>	10	10	15
Number of blades	pcs	3	3	3
Rotation speed	rpm	max. 650	max. 550	max. 3000
Weight (one blade)	kg	3,2	3,3	9,2
Sense of rotation		left (in front)	left (in front)	right (front)
The design of the gearbox		without reducer	without reducer	without reducer
Generator		synchronous	synchronous	synchronous





## Control System BMC 908

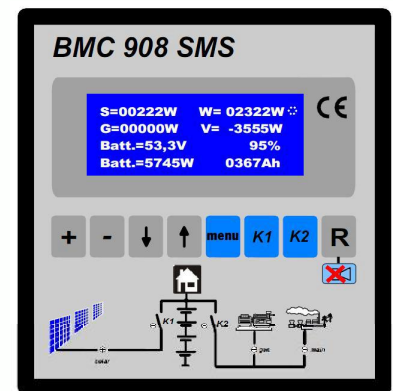
If solar energy is available, BMC 908 system disconnect public network completely and use the energy from the sun. If the depth of discharge of the batteries under load reached 30%, the control system will automatically turn back on the overall network. If the sunlight is too weak, the wind turbine energy can be used. In areas without electrification, the necessary electric power is provided through diesel generators as the last resort.

### Controlled Parameters:

- Mains electricity
- Charge the battery via the solar modules
- Temperature mode
- Charge the battery via the mains powers
- Charge the battery via the diesel generator
- Monitoring the condition of the battery and the charge level of the interval
- Management and documentation through a monitoring program
- Monitoring the condition of the battery and the charge level of the interval
- Energy and voltage of generator
- Energy and voltage of wind generator
- The load voltage and energy consumption
- Air conditioner settings, etc.

### Technical Data:

- Operating temperature: -20 and +50 ° C
- Cabinet with protection class IP44 for maximum tightness
- BMC908 controller with built-in modem, GSM (screen inside)
- Fuses on the input of solar panels
- Fuses to batteries
- Additional fuses for the second group 800 Ah
- Load power contactor priority No.1 (ca. 50 A)
- Power contactor is not a priority load No. 2 (ca. 100 A)
- The fuse on the outputs of priority load No. 1
- The fuse on the outputs of not priority load No. 2
- Additional fuses for loads

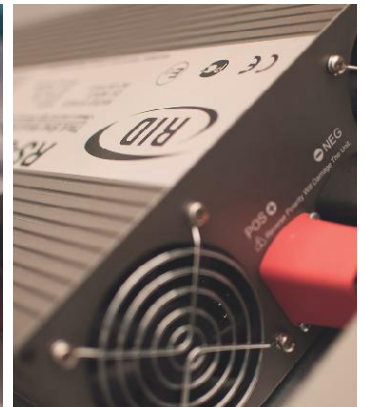


Control Cabinet BMC 908





# Components of Hybrid Systems



## Battery Cabinet with Control System



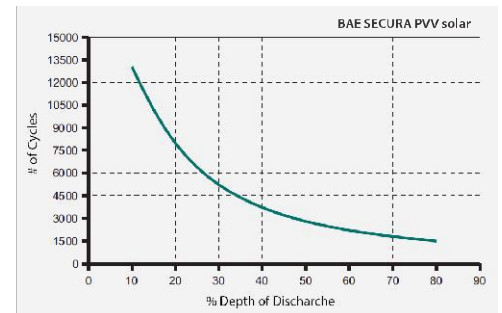
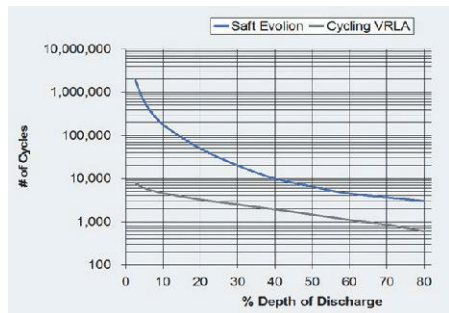
### Battery Cabinet Outdoor

Battery cabinet includes: unit battery, inverter, air conditioning, control of battery charging and control system RID BMC908. We also offer a model of the enclosure protected against vandalism. Built-conditioning system maintains the temperature mode. Operating temperature range from -40 to +55 ° C



### Batteries

Rechargeable batteries SAFT Evolion 48V, (C8 = 616 Ah) made in Germany are used in hybrid systems of power supply and UPS Lithium-Ion battery type in accordance with the latest technology. The number of cycles at 80% DOD: 4300. Operating temperature from 40 to +65 ° C



### Inverters AC / DC (RS-1000, RS-1500, RS-3000, RS-6000)

An AC / DC Inverter, convert direct current to alternating current 48 volts. Devices with stable pure sine wave are rated from 1 to 3 kW.



### The Battery Controller Charge OutBack PV FM 80 MPPT

- Nom. voltage: 12, 24, 36, 48, 60
- Max. Current: 80 A to 40 C
- Max. Power generating: 12-1250W, 24 B-2500W, 48V-5000 W, 60-W 6250
- Recommended Power: 12-1000W, 24-2000W 48-4000W, 60-5000W
- Charge voltage: 10 to 80 V
- Network communication: RJ45
- Operating temperature: -40 to +60 ° C

## Diesel Generator Sets 48 V DC (with Mitsubishi Engines)



### TECHNICAL DATA

Type		RID 8/48 DC E-SERIES	RID 8/48 DC E-SERIES S	RID 10/48 DC E-SERIES	RID 10/48 DC E-SERIES S	RID 15/48 DC E-SERIES	RID 15/48 DC E-SERIES S
Version		open	silent	open	silent	open	silent
Order number		713608	713609	713624	713625	713648	713649
Nom. output P.R.P.	KVA	6,5		8,4		12	
Nom. current	A	135		170		50 - 250	
Nom. voltage	V	42-56		48		48	
Frequene	Hz	DC		DC		DC	
Dimensions (L x W x H)	mm	1455 x 755 x 1180	1706 x 812 x 1199	1455 x 755 x 1180	1706 x 812 x 1199	1437 x 785 x 1032	1706 x 812 x 1199
Weight	kg	410	570	440	600	470	640
Noise level	dB(A)	79	59	79	59	80	60
Fuel tank capacity	l	200	200	200	200	200	200
<b>Engine</b>	<b>Mitsubishi</b>	<b>L3E</b>		<b>S3L2</b>		<b>S4L2</b>	
Rotation speed range	rpm	1300-1600		1300-1600		1300-1600	
Speed governor		electronic		electronic		electronic	
Fuel		diesel		diesel		diesel	
Cooling system		water+air		water+air		water+air	
Displacement	l	0,95		1,3		1,8	
Engine output	kW	6,4		10,8		15,4	
Starter	V	12		12		12	
Oil type (recommended)		5W40/10W40		5W40/10W40		5W40/10W40	
Oil volume in engine	l	3,5		4,2		6	
Fuel consumption load 100/75%	l/h	2,4/1,85		3,1/2,4		4,1/3,4	
<b>Generator</b>		synchronous		synchronous		synchronous	
Isolation type		H		H		H	
Protection class		IP 23		IP 23		IP 23	
<b>Advantage</b>		maintenance interval 1000 operating hours • rust-resistant fuel tank					

### OPTIONS

### ORDER NUMBER

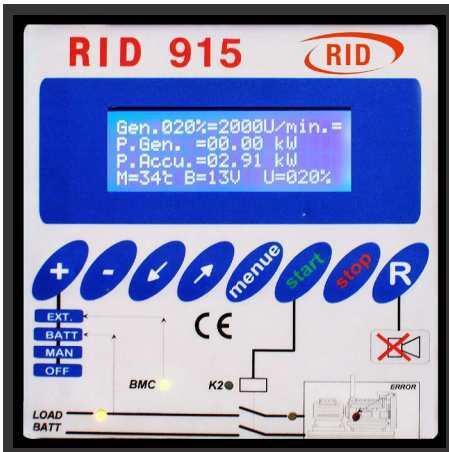
Coolant heater (230 V)	715008	715008	715008	715008	715008	715008
Fuel heater (230 V)	753002	753002	753002	753002	753002	753002
Fuel filter/water separator	754003	754003	754002	754002	754002	754002
Genset with fuel tank 500/1000 l	718000/718010	718000/718010	718000/718010	718000/718010	718000/718010	718000/718010
GSM modem	729018	729018	729018	729018	729018	729018
IP modem	729019	729019	729019	729019	729019	729019



# Monitoring System and Controller RID 915

## Controller RID 915 for Diesel Generator Sets 48 V DC

Controller RID 915 (Main controller) provides control of the main parameters of the diesel generators with automatic stop and alarm indication. RID 915 perform remote starting from the system control RID BMC 908 or run the genset incase of low battery condition. It is also possible to remotely monitor and control of the diesel generator set per networks GSM / GPRS / Ethernet).



RID 915 controls the load of the diesel generator set through the adjustment of speed range, which saves fuel. The controller has three main operating modes: remote, battery and manual.

In remote mode the controller RID 915 responds and starts the engine by remote signal from the controller BMC908. In battery mode the controller RID 915 responds to the charge in the installed battery and starts automatically diesel generator if battery voltage decrease. In manual mode, start and stop of the generator is run manually.

## Monitoring System for Remote Control of Diesel Generator Sets and Hybrid Systems via Networks GSM/GPRS/Ethernet

### Controlled Parameter:

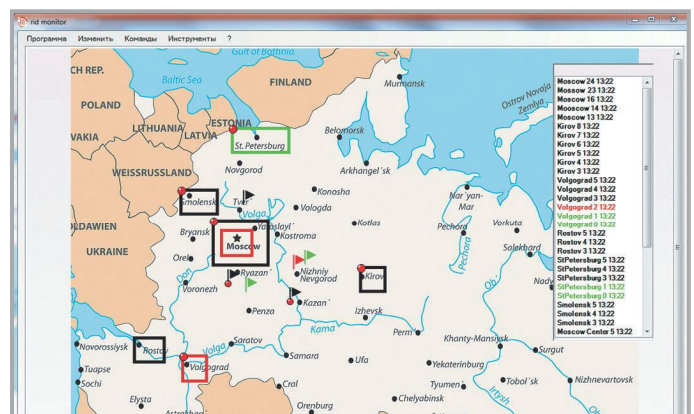
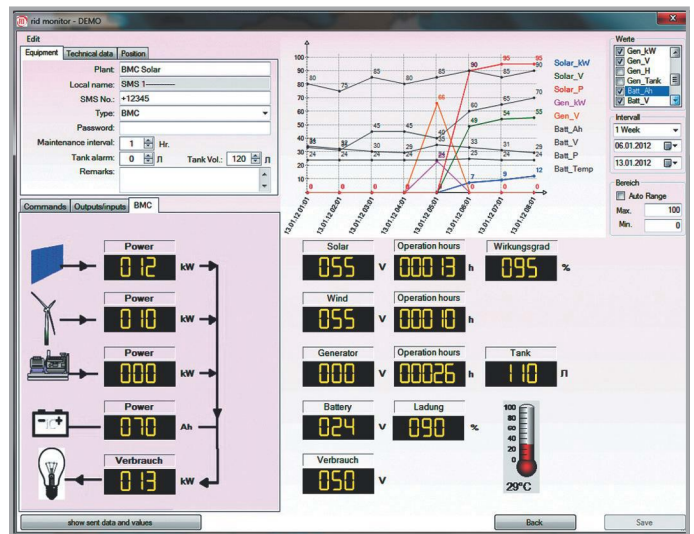
Main control, generator control, fuel tank control, temperature control, maintenance cycle control, main/generator power control, solar energy control, wind energy control, battery supply control, ventilation remote control, air condition remote control, video supervision control.

### System Advantages:

- Easy installation, configuration and control
- Overview the status of all objects
- possibility to Create separate regions on the map
- Detailed information about parameters of hybrid systems (wind generators, solar panels, batteries, gensets, load)
- The ability to download the necessary maps
- Four Task Schedulers of genset mode
- Detailed information of gensets and network
- Installation of test starts intervals
- Technical support
- Chart of effectiveness of hybrid systems mode

### Complete adaptation PLUG-IN for:

ZTE E-Guard, HUAWEI M2000, Ericsson CUDB via RS485 and CAN-BUS







**INNOVATION!**



**TECHNICAL DATA**

Type		<b>RID RS 7 GS - HOME 6 KW</b>	<b>RID RS 10 GS - HOME 8 KW</b>	<b>RID RS 14 GS - HOME 11 KW</b>	<b>RID RS 14 GS - HOME 11 KW</b>
Order number		713890	713891	713892	713893
Engine output NG /LG	kVA	6 /5,4	8/6,5	13,8 /11,5	16,8/14
Max. current NG/LG	A	26/23	34/28	60/50	73/60
Nom. voltage	V	230	230	230	500
Frequency	Hz	50	50	50	50
Displacement	m <sup>3</sup> /cm	500	570	993	993
Cooling system		air	air	air	air
Gas pressure (NG/LG)	mbar	12,5-17,4 / 27-35	12,5-17,4 / 27-35	12,5-17,4 / 27-35	12,5-17,4 / 27-35
Weight	kg	114,3	123,4	227	227
<b>Engine</b>		<b>B&amp;S Intek</b>	<b>B&amp;S Vanguard</b>	<b>B&amp;S Vanguard</b>	<b>B&amp;S Vanguard</b>
Rotation speed range	rpm	3000	3000	3000	3000
Gas		LG / NG	LG / NG	LG / NG	LG / NG
Number of cylinder		1	2	2	2
Starter		electrical/automatic	electrical/automatic	electrical/automatic	electrical/automatic
Fuel/Gas consumption load 100/75%	m <sup>3</sup> /h	1,75	2,5	3,5	4,5
Dimensions (L x W x H)	mm	700 x 620 x 890	700 x 620 x 890	1210 x 863 x 787	1210 x 863 x 787
Noise pressure level	dB(A)	66	66	66	66
Oil type (recommended)		10W40	10W40	10W40	10W40
Operating temperature	°C	from -28,8 to +40	from -28,8 to +40	from -28,8 to +40	from -28,8 to +40
Battery voltage	V	12	12	12	12
Speed governor		mechanical	mechanical	electrical	electrical
Front cover		galvanneal steel enclosure	galvanneal steel enclosure	galvanneal steel enclosure	galvanneal steel enclosure

**Gas Generators with Engines Briggs & Stratton for Private Use**

Our gas generators are a novelty in the international energy market. The series of vertical gas generators is equipped with gas engines from Briggs & Stratton. These units are suitable for private use. All combustible gases can be used as fuel for Briggs & Stratton gas engines. The soundproof casing ensures low noise at 66 dB (A). During a power failure, the emergency control starts the gas generator automatically. The pre-heating of the battery and engine is meant for easier start during cold seasons.





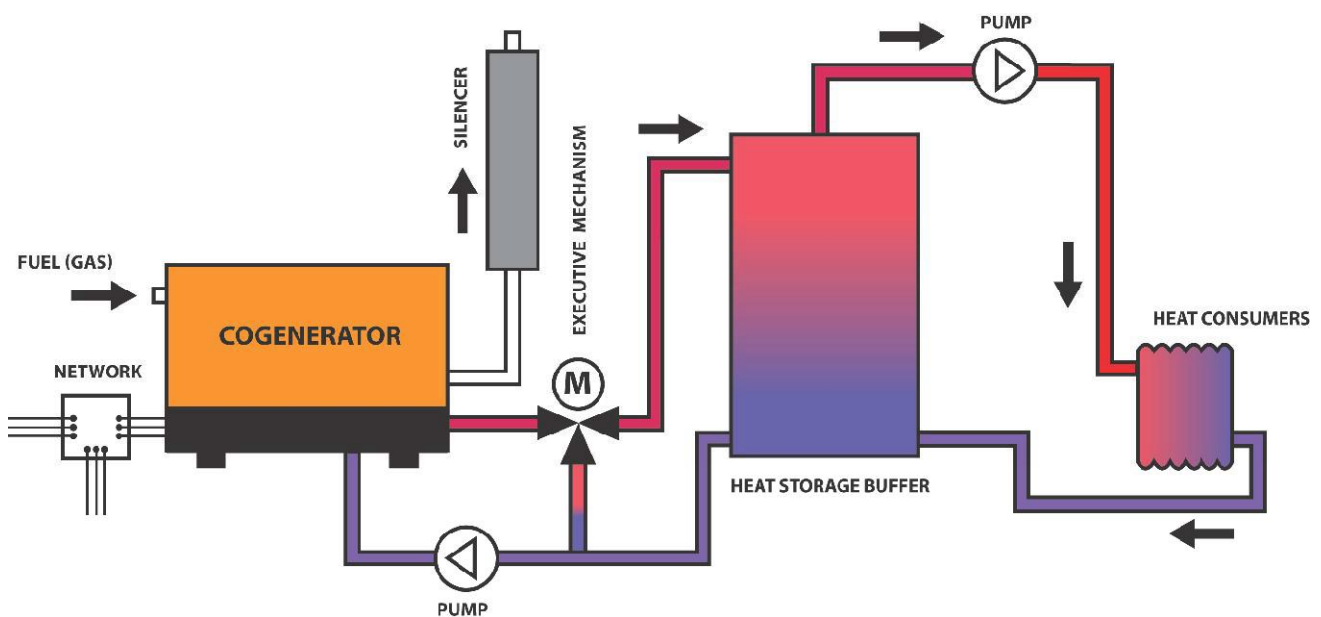
# Independent Generating of Heat and Electricity



Cogeneration plant is the gas thermal power plants employed in simultaneous generation of electricity and useful heat. We offer plants from 20 kW to 2000 kW.

Cogenerators can provide independent power supply of several separate buildings or construction sites, a complete independence from the central power and heating. Cogenerating plants have very high efficiency of thermal power of (80%). Compared with conventional diesel generators the Cogenerators are much more efficient and cost effective. In addition, it minimizes the use of environmentally harmful emissions that cause the greenhouse effect.

## SCHEME OF HEAT AND ELECTRICITY GENERATING FROM COGENERATOR



## Associated Gas as Byproduct of Oil Production

Through production of 1 ton of oil, 25 to 800 m<sup>3</sup> associated gas can be created or co-sponsored. Associated gas is found in nature as an oil-field upper layer oil or dissolved gas. Oil associated gas is rich of energy and relatively environmentally friendly fuel. It consists of methane, ethane, propane and isobutene. Russia alone produces yearly 100 million tons of CO<sub>2</sub> through the combustion of petroleum gas in flame.

There are around 400 million such petroleum combustion worldwide. During combustion fuel sulfur water, oil vapors, chlorine and other substances are produced and end up in the air. Gas treatment is often required. The problem and solution technologies are well known.

### Utilization of Associated Gas

Associated gas can be utilized for the following purposes:  
Fuel power generation, heat production, and for the production of plastics.

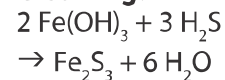


### Gas Cleaning Process

Gas purification procedure must be performed to allow associated gas to be used as fuel for power generation. Associated gas is cleaned through absorption with activated carbon and iron hydroxide.



#### Cleaning:



#### Wash:

iron sodium chloride FeCl<sub>2</sub>

Company **R.I.D. GmbH** offers solutions for the cleaning and recycling of associated gas to produce energy.



**20 - 70 kVA****Cogeneration Plants****Advantages of Cogeneration Plants**

One of the advantages of the combined generating of electricity and heat is that energy generating occurs in the immediate vicinity of the user. Due to the short length of the power supply lines loss of energy is reduced.

Cogeneration Plants are increasingly installed directly in the field of extraction of Gas such as biogas. It can also be used to utilize associated gases, which further reduces the cost of transportation on fuel.

**TECHNICAL DATA**

Type		<b>BHKW RID 20 F-SERIES S</b>	<b>BHKW RID 40 F-SERIES S</b>	<b>BHKW RID 70 T-SERIES S</b>
Order number		713809	713869	713871
Engine output (cos $\varphi = 0,8$ )	kVA	25	50	85
Effective electric. power	kW	20	40	68
Heat power	kW	20	78	130
Mechanical power	kW	24	26,5	86
Efficiency	%	33	51,6	29,3
General efficiency	%	83	78,1	85,3
Nom. voltage	V	400	400	400
Frequence	Hz	50	50	50
<b>Engine</b>		<b>Ford MSG-425</b>	<b>Ford WSG-1068</b>	<b>TEDOM TG 85</b>
Rotation speed range	rpm	1500	1500	1500
Dimension (L x W x H)	mm	1854 x 1600 x 912	2325 x 1627 x 1020	2325 x 1627 x 1020
Fuel		N-gas MZ 80	N-gas MZ 80	N-gas MZ 80
Weight	full/empty	820 / 770	1200 / 1050	1300 / 1100
Cooling		water	water	water
Displacement	dm <sup>3</sup>	2,5	6,8	11,9
Number of cylinder	pcs	4 R	10 V	6 R
Starter	V	12	12	12
Oil volume in engine	l	35	49	60
Fuel/gas consumption	m <sup>3</sup> /h	5	10	17
Fuel using	kW	70	151	232
Combustion air	m <sup>3</sup>	28	290	450
Emissions of gases and water		tube bundle	tube bundle	tube bundle
Temperature of the hot supply water	°C	92	90	90
Temperature of the heating water	°C	80	86	86
Temperature of gas emissions	°C	120	120	120
<b>Generator</b>		<b>synchronous</b>	<b>synchronous</b>	<b>synchronous</b>
Isolation type		H	H	H
Protection class		IP 23	IP 23	IP 23
Coolant volume	l	45	120	150

Cogeneration Plants

100 - 200 kVA



TECHNICAL DATA

Type		BHKW RID 100 B-SERIES S	BHKW RID 150 L-SERIES S	BHKW RID 200 B-SERIES S
Order number		713873	713875	713877
Engine output (cos φ = 0,8)	kVA	130	200	250
Effectiveness electric. power	kW	104	160	200
Heat power	kW	160	270	390
Mechanical power	kW	128	175	230
Electr. efficiency	%	32,7	36,9	34,2
Heat efficiency	%	89,2	89,8	90,7
Nom. voltage	A	144	200	288
Nom. voltage	V	400	400	400
Frequency	Hz	50	50	50
<b>Engine</b>		<b>Doosan GE08TI</b>	<b>Liebherr</b>	<b>Doosan GV 158 TI</b>
Rotation speed range	rpm	1500	1500	1500
Dimension (L x W x H)	mm	2720 x 1708 x 1130	2720 x 1708 x 1130	4000 x 2185 x 1300
Fuel		N-gas MZ 80	N-gas MZ 80	N-gas MZ 80
Weight	full/empty	1800 / 1600	2000 / 1750	2500 / 2200
Cooling		water	water	water
Displacement	dm <sup>3</sup>	8	11,05	18,27
Number of cylinder	pcs	6 R	6 R	8 V
Starter	V	12	12	12
Oil volume in engine	l	80	200	200
Fuel/gas consumption	m <sup>3</sup> /h	32	43	58
Fuel using	kW	318	434	584
Combustion air	m <sup>3</sup>	650	850	1374
Emissions of gases and water		tube bundle	tube bundle	tube bundle
Temperature of the hot supply water	°C	90	90	90
Temperature of the heating water	°C	86	86	85
Temperature of gas emissions	°C	120	120	120
<b>Generator</b>		<b>synchronous</b>	<b>synchronous</b>	<b>synchronous</b>
Isolation type		H	H	H
Protection class		IP 23	IP	IP
Coolant volume	l	200	200	150





Made in Germany

R.I.D. GmbH - Power Generating Systems



**250 - 350 kVA**

Cogeneration Plants



**TECHNICAL DATA**

Type		BHKW RID 250 L-SERIES S	BHKW RID 300 B-SERIES S	BHKW RID 350 L-SERIES S
Order number		713879	713881	713883
Engine output (cos φ = 0,8)	kVA	300	375	437
Effectiveness electric. power	kW	240	290	340
Heat power	kW	400	450	390
Electr. efficiency	%	32,1	36,9	34,2
Heat efficiency	%	53,5	89,8	90,7
Nom. voltage	V	400	400	400
Frequence	Hz	50	50	50
<b>Engine</b>		<b>Liebherr G946TI</b>	<b>Doosan GE12TI</b>	<b>Liebherr G950 TI</b>
Rotation speed range	rpm	1500	1500	1500
Dimension (L x W x H)	MM	2611 x 1200 x 1865	3351 x 1700 x 2332	3351 x 1700 x 2332
Fuel		N-gas MZ 80	N-gas MZ 80	N-gas MZ 80
Weight	full/empty	2800 / 2600	2000 / 1750	2500 / 2200
Cooling		water	water	water
Displacement	dm <sup>3</sup>	12	18,3	16,7
Number of cylinder	pcs	12 V	6 R	8 V
Starter	V	24	24	24
Oil volume in engine	l	200	200	200
Fuel/gas consumption	m <sup>3</sup> /h	75	96	110
Combustion air	m <sup>3</sup> /h	1850	1200	4800
Emissions of gas and water		tube bundle	tube bundle	tube bundle
Emissions of gas	m <sup>3</sup> /h	2900	3800	4800
Temperature of the hot supply water	°C	90	90	90
Temperature of the heating water	°C	85	85	85
<b>Generator</b>		<b>synchronous</b>	<b>synchronous</b>	<b>synchronous</b>
Isolation type		H	H	H
Protection class		IP 23	IP	IP
Hot water inlet	∅	3"	3"	150
Gas inlet	∅	2"	2"	3"
Exhaust inlet	∅	125 mm	125 mm	150 mm



**TECHNICAL DATA**

Type		<b>BHKW RID 400 E-SERIES S</b>	<b>BHKW RID 450 E-SERIES S</b>	<b>BHKW RID 500 L-SERIES S</b>
Order number		713885	713887	713889
Engine output(cos Φ = 0,8)	kVA	500	562	625
Effectiveness electric. power	kW	400	450	500
Heat power	kW	500	510	520
Nom. voltage	B	400	400	400
Frequency	Hz	50	50	50
Dimension (L x W x H)	mm	4000 x 2185 x 1300	4000 x 2185 x 1300	4000 x 2185 x 1300
Weight(kg)	full/empty	4500 / 4000	4500 / 4000	4500 / 4000
<b>Engine</b>		<b>Mitsubishi</b>	<b>Mitsubishi</b>	<b>Liebherr</b>
Rotation speed range	rpm	1500	1500	1500
Fuel		N-gas MZ 80	2720 x 1708 x 1130	4000 x 2185 x 1300
Cooling		water	N-gas MZ 80	N-gas MZ 80
Displacement	dm <sup>3</sup>	18	2000 / 1750	2500 / 2200
Number of cylinder		12 V	water	water
Starter	B	8	11,05	18,27
Oil volume in engine	л	6 R	6 R	8 V
Fuel/gas consumption	m <sup>3</sup> /h	125	12	12
Combustion air	m <sup>3</sup> /h	2300	200	200
Temperature of gas emissions	°C	120	43	58
Temperature of the hot supply water	°C	90	434	584
Temperature of the heating water	°C	85	850	1374
<b>Generator</b>		synchronous	90	90
Isolation type		H	86	85
Protection class		IP 23	120	120
Hot water inlet	∅	on request	<b>synchronous</b>	<b>synchronous</b>
Gas inlet	∅	on request	H	H
Exhaust inlet	∅	on request	IP	IP

All cogenerators, still also as gas generators can be operated with the following fuel gases:  
 NG gas, LG gas, associated gas and other combustible gases with methan number > 80



Manufacturing and office facilities





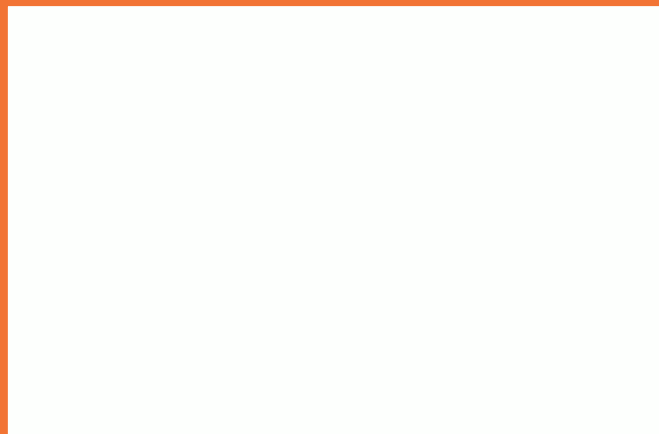
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Please, be aware, that the technical data are valid at the time of publication and is a subject to change.