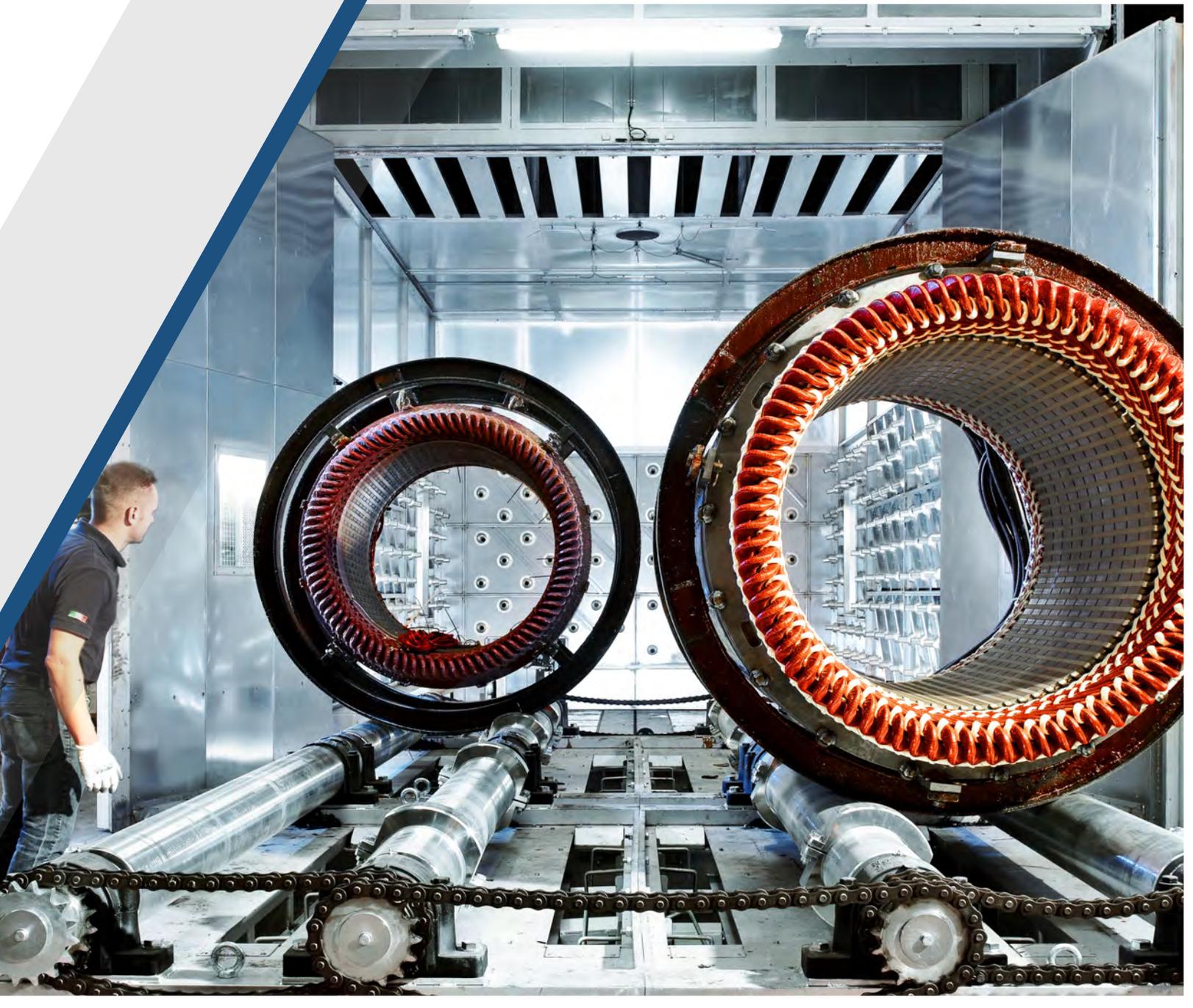
MarelliMotori
Inspired solutions



Marelli Motori
DOCUMENTATION

INSPIRED PEOPLE

OUR VISION

To become the global market leader of electric rotating machines in all our core markets.

OUR MISSION

Our mission is to aid the sustainable growth of our customers' businesses.
We will provide innovative solutions inspired by relentless efforts to understand our customers' needs and their specific applications.
We will leverage our extensive technical knowledge, product performance and service to increase the competitiveness, efficiency and productivity of our partners worldwide.

INSPIRED SOLUTIONS

Marelli Motori is a leading designer and manufacturer of generators and electric motors.
Nowadays the company enjoys worldwide brand recognition thanks to our extended sales, distribution and service networks across four continents and two manufacturing facilities, in Italy and Malaysia.

MARELLI MOTORI OPERATES IN SIX CORE INDUSTRIES






Power generation
Generators up to 14.000 kVA

Cogeneration
Generators up to 14.000 kVA

Hydropower
Asynchronous generators up to 3.000 kW
Synchronous generators up to 11.000 kVA

Oil & gas
Generators up to 14.000 kVA
Motors up to 1.600 kW

Industrial motors
Motors up to 10.000 kW

Marine
Generators up to 12.500 kVA
Motors up to 10.000 kW

MarelliMotori Hydropower

MJHRT

Model	MJHRT
Power	Up to 11.000 kVA
Voltages	Up to 15.000 V
Frame	400 ± 1.250
Poles	From 4 to 20 poles (over contact MM)
Cooling	IC 81W
IP	IP 44. Available up to IP 55.
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled
Main Applications	Cross-Flow turbines, Francis turbines, Kaplan turbines, Pelton turbines, Turgo turbines
Sector	Hydropower

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request.

Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – TN).Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.Dedicated shaft design available on request.Special shaft design for direct coupling with runner are available on request.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR)depending on application requirements.

Heat Exchanger	Construction Mounted on top of alternator.Double tube made of CuNi 90/10.Copper fins housing.Equipped with water leakage detector. Exchanger data Designed pressure 6 bar Test pressure 10 bar Power: up to 200 kW Water flow: up to 18 m3/h Max glycol: 30% Type of water: fresh water Flanges: PN6 – PN10 – Special (ANSI) Position can be adjusted to site conditions.
Construction	
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled
Cooling System	IC81W as per IEC60034-6. Primary fluid (water) is flowing by external water system. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Degree of protection	IP 44 as per IEC60034-5. (Available up to IP 55)
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7.Vertical IM 3011 as per IEC 60034-7Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type.Made by copper flat wire.H class insulated with enamel coating.Winding retaining by pass-through bars of high quality steel.Rotating rectifier: Graetz diode bridge with 6 diodes.Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.
Bearing	General data Double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing.The theoretical lifetime of

bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours.Locating bearings are on the D end side and floating bearings on the ND end side.

Bearing selection

Antifriction bearings up to 900 frame size included depending on nominal speed, overspeed and mechanical load on the shaft.

Sleeve bearings available from 400 frame size.

Regreasing system:

Generators in horizontal mounting and equipped with antifriction bearing include a regrasing system.

BEARINGS	ANTIFRICTION BEARINGS	
MOUNTING	HORIZONTAL MOUNTING	VERTICAL MOUNTING
AVAILABLE LUBRICATION TYPE D-END / ND-END	BOTH GREASE WITH REGREASING SYSTEM	BOTH GREASE WITH REGREASING SYSTEM
	D-END: GREASE WITH REGREASING SYSTEM ND END: OIL WITH OIL REFILL SYSTEM (ONLY FOR SPECIAL LOW SPEED CONSTRUCTION)	D-END: GREASE WITH REGREASING SYSTEM ND END: OIL BATH OIL REFILL SYSTEM
AVAILABLE BEARING COOLING SYSTEM	NATURAL	NATURAL

BEARING	SLEEVE BEARINGS	
MOUNTING	HORIZONTAL MOUNTING	VERTICAL MOUNTING
AVAILABLE LUBRICATION TYPE D-END / ND-END	BOTH NATURAL OIL LUBRICATED	BOTH NATURAL OIL LUBRICATED
	BOTH OIL FORCED LUBRICATED	BOTH OIL FORCED LUBRICATED
AVAILABLE BEARING COOLING SYSTEM	NATURAL LUBRICATED ARE COOLED BY WATER	
	OIL FORCED LUBRICATED ARE COOLED BY AN EXTERNAL OIL LUBE SYSTEM	

Bearing insulation

ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces.Insulated antifriction bearings in standard configuration:

4, 6 poles: insulated ND end bearing from 630 frame size

8 poles: insulated bearing from 400 frame size

10 poles and above: insulated bearing from 500 frame size

	All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.
Insulation system	Stator: F class insulated with a synthetic enamel (class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters.Epoxivinilic: Epoxy two component products, with vinyl change.Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour, 15% for 10 minutes, 30% for 4 minutes, 50% for 2 minutes. These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific SCR. Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816.Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Inertia

All generators can be designed to meet specific inertia value also through flywheel. Values can be confirmed by contacting Marelli Motori.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
400 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 1.250	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

Size	Type	
Medium Voltage	All	CT + Overboosting device
High voltage	All	VT+CT+Overboosting device

Space heaters

Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800
1.000	1.000
1.120	1.200
1.250	1.400

Heaters installed at ND-end side.

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD for inlet / outlet water

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with runner neutral point terminals in separate terminal box increase protection degree up to IP 44 with filters dedicated design to couple the generator with existing baseframe air duct system to convey inlet / outlet cooling air redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system arrangement for vibration sensors lubrication system for sleeve bearing flywheel and locking device for dedicated inertia value brake system other options available on request.

MarelliMotori Hydropower

MJHT

Model	MJHT
Power	Up to 11.000 kVA
Voltages	Up to 6.600 V
Frame	400 ± 1.250
Poles	From 4 to 20 poles (over contact MM)
Cooling	IC 01
IP	IP 23. Available up to IP 44 with filters.
Enclosure	ODP - Open Drip Proof
Main Applications	Cross-Flow turbines, Francis turbines, Kaplan turbines, Pelton turbines, Turgo turbines
Sector	Hydropower

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request.

Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key. Dedicated shaft design available on request. Special shaft design for direct coupling with runner are available on request.
Main terminal box	Mounted on top up to 900 frame size. Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.
Construction	
Enclosure	ODP - Open Drip Proof
Cooling System	IC 01 as per IEC60034-6
Degree of protection	IP 23 as per IEC60034-5
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Vertical IM 3011 as per IEC 60034-7 Other mounting available on request.

Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.
Bearing	General data Double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 900 frame size included depending on nominal speed, overspeed and mechanical load on the shaft. Sleeve bearings available from 400 frame size. Regreasing system: Generators in horizontal mounting and equipped with antifriction bearing include a regreasing system.

<table>
<tr><td>-</td><td colspan="2">ANTIFRICTION BEARINGS</td><td colspan="2">SLEEVE BEARINGS</td></tr>
<tr><td>-</td><td>HORIZONTAL MOUNTING</td><td>VERTICAL MOUNTING</td><td>HORIZONTAL MOUNTING</td><td>VERTICAL MOUNTING</td></tr>
<tr><td rowspan="2">AVAILABLE LUBRICATION

TYPE D-END / ND-END</td><td>BOTH GREASE WITH REGREASING SYSTEM</td><td>BOTH GREASE WITH REGREASING SYSTEM</td><td>BOTH NATURAL OIL LUBRICATED</td><td>BOTH NATURAL OIL LUBRICATED</td></tr>
<tr><td>D-END: GREASE WITH REGREASING SYSTEM

ND END: OIL WITH OIL REFILL SYSTEM

(ONLY FOR SPECIAL LOW SPEED CONSTRUCTION)</td><td>D-END: GREASE WITH REGREASING SYSTEM

ND END: OIL BATH OIL REFILL SYSTEM</td><td>BOTH OIL FORCED LUBRICATED</td><td>BOTH OIL FORCED LUBRICATED</td></tr>
<tr><td rowspan="2">AVAILABLE LUBRICATION

TYPE D-END / ND-END</td><td rowspan="2">NATURAL</td><td rowspan="2">NATURAL</td><td colspan="2">NATURAL LUBRICATED ARE COOLED BY WATER</td></tr>
<tr><td colspan="2">OIL FORCED LUBRICATED ARE COOLED BY AN EXTERNAL OIL LUBE SYSTEM</td></tr>
</table>

Bearing insulation

ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces.
Insulated antifriction bearings in standard configuration:
4, 6 poles: insulated ND end bearing from 630 frame size
8 poles: insulated bearing from 400 frame size
10 poles and above: insulated bearing from 500 frame size
All ND end sleeve bearings are insulated as standard.

Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.
Insulation system	Stator: F class insulated with a synthetic enamel (class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.

Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific SCR. Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.
Inertia	All generators can be designed to meet specific inertia value also through flywheel. Values can be confirmed by contacting Marelli Motori.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
400 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 1250	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

	Size	Type
Medium Voltage	All	CT + Overboosting device
High voltage	All	VT+CT+Overboosting device

Space heaters

Heaters installed at ND-end side.

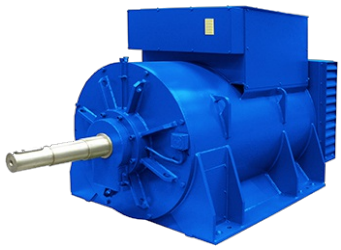
Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800
1000	1000
1120	1200
1250	1400

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box. Other configurations available:
DUPLEX type
RTD for inlet / outlet air

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with runner neutral point terminals in separate terminal box increase protection degree up to IP 44 with filters dedicated design to couple the generator with existing baseframe air duct system to convey inlet / outlet cooling air redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system arrangement for vibration sensors lubrication system for sleeve bearing flywheel and locking device for dedicated inertia value brake system other options available on request.

MarelliMotori Hydropower



MJT

Model	MJT
Power	Up to 5.200 kVA
Voltages	Up to 690 V
Frame	160 ± 900
Poles	From 4 to 20 poles (over contact MM)
Cooling	IC 01
IP	IP 23. Available up to IP 44 with filters.
Enclosure	ODP - Open Drip Proof
Main Applications	Cross-Flow turbines, Francis turbines, Kaplan turbines, Pelton turbines, Turgo turbines
Sector	Hydropower

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request.

Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Motori Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key. Dedicated shaft design available on request. Special shaft design for direct coupling with runner are available on request.
Main terminal box	Mounted on top up to 900 frame size. Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.
Construction	
Enclosure	ODP - Open Drip Proof
Cooling System	IC 01 as per IEC60034-6
Degree of protection	IP 23 as per IEC60034-5
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Vertical IM 3011 as per IEC 60034-7 Other mounting available on request.

Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing

General data

Double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side.

Bearing selection

Antifriction bearings up to 900 frame size included depending on nominal speed, overspeed and mechanical load on the shaft.

Sleeve bearings available from 400 frame size.

Regreasing system:

Generators in horizontal mounting and equipped with antifriction bearing include a regrasing system.

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<tr><th colspan="2">ANTIFRICTION BEARINGS</th><th colspan="2">SLEEVE BEARINGS</th><th></th></tr>
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ND END: OIL BATH OIL REFILL SYSTEM</td><td>BOTH OIL FORCED LUBRICATED</td><td>BOTH OIL FORCED LUBRICATED</td></tr>
<tr><td rowspan="2">AVAILABLE LUBRICATION

TYPE D-END / ND-END</td><td rowspan="2">NATURAL</td><td rowspan="2">NATURAL</td><td colspan="2">NATURAL LUBRICATED ARE COOLED BY WATER</td></tr>
<tr><td colspan="2">OIL FORCED LUBRICATED ARE COOLED BY AN EXTERNAL OIL LUBE SYSTEM</td></tr>
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Bearing insulation

ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces.

Insulated antifriction bearings in standard configuration:

4, 6 poles: insulated ND end bearing from 630 frame size

8 poles: insulated bearing from 400 frame size

10 poles and above: insulated bearing from 500 frame size

All ND end sleeve bearings are insulated as standard.

Insulation system	Stator: H class insulated with a synthetic enamel (class F standard for generators with H>=800 or form wound form H=400. Class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific SCR. Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Inertia

All generators can be designed to meet specific inertia value also through flywheel. Values can be confirmed by contacting Marelli Motori.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
160 - 250	MARK V analog
315 - 450	MEC 20 analog/digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 900	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

Low Voltage

	Size	Type
Low voltage	160 - 450 (4 poles)	Auxiliary winding
	160 - 450 (>4 poles)	Varicomp
	500 - 710 (all polarities)	Varicomp
	800 - 900	VARICOMP

Space heaters

Heaters installed at ND end side.

Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box. Other configurations available:
DUPLEX type
RTD for inlet / outlet air

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with runner neutral point terminals in separate terminal box increase protection degree up to IP 44 with filters dedicated design to couple the generator with existing baseframe air duct system to convey inlet / outlet cooling air redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system arrangement for vibration sensors lubrication system for sleeve bearing flywheel and locking device for dedicated inertia value brake system other options available on request.

MarelliMotori Hydropower

MJRT

Model	MJRT
Power	Up to 5.000 kVA
Voltages	Up to 690 V
Frame	250 ± 900
Poles	From 4 to 20 poles (over contact MM)
Cooling	IC 81W / IC 86W
IP	IP 44. Available up to IP 56.
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled
Main Applications	Cross-Flow turbines, Francis turbines, Kaplan turbines, Pelton turbines, Turgo turbines
Sector	Hydropower

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request.

Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key. Dedicated shaft design available on request. Special shaft design for direct coupling with runner are available on request.
Main terminal box	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Vertical IM 3011 as per IEC 60034-7 Other mounting available on request.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.

Heat Exchanger	Construction Mounted on top of alternator. Double tube made of CuNi 90/10. Copper fins housing. Equipped with water leakage detector. Exchanger data Designed pressure 6 bar Test pressure 10 bar Power: up to 200 kW Water flow: up to 18 m3/h Max glycol: 30% Type of water: fresh water Flanges: PN6 – PN10 – Special (ANSI) Position can be adjusted to site conditions
Construction	
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled
Cooling System	IC81W as per IEC60034-6. Primary fluid (water) is flowing by external water system. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Degree of protection	IP 44 as per IEC60034-5. (Available up to IP 56)
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Vertical IM 3011 as per IEC 60034-7 Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.
Bearing	General data Double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard

horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side.

Bearing selection

Antifriction bearings up to 900 frame size included depending on nominal speed, overspeed and mechanical load on the shaft.

Sleeve bearings available from 400 frame size.

Regreasing system:

Generators in horizontal mounting and equipped with antifriction bearing include a regrasing system.

<table>
<tr><td></td><td colspan="2">ANTIFRICTION BEARINGS</td><td colspan="2">SLEEVE BEARINGS</td></tr>
<tr><td></td><td>HORIZONTAL MOUNTING</td><td>VERTICAL MOUNTING</td><td>HORIZONTAL MOUNTING</td><td>VERTICAL MOUNTING</td></tr>
<tr><td rowspan="2">AVAILABLE LUBRICATION
TYPE D-END / ND-END</td><td>BOTH GREASE WITH REGREASING SYSTEM</td><td>BOTH GREASE WITH REGREASING SYSTEM</td><td>BOTH NATURAL OIL LUBRICATED</td><td>BOTH NATURAL OIL LUBRICATED</td></tr>
<tr><td>D-END: GREASE WITH REGREASING SYSTEM
ND END: OIL WITH OIL REFILL SYSTEM
(ONLY FOR SPECIAL LOW SPEED CONSTRUCTION)</td><td>D-END: GREASE WITH REGREASING SYSTEM
ND END: OIL BATH OIL REFILL SYSTEM</td><td>BOTH OIL FORCED LUBRICATED</td><td>BOTH OIL FORCED LUBRICATED</td></tr>
<tr><td rowspan="2">AVAILABLE LUBRICATION
TYPE D-END / ND-END</td><td rowspan="2">NATURAL</td><td rowspan="2">NATURAL</td><td colspan="2">NATURAL LUBRICATED ARE COOLED BY WATER</td></tr>
<tr><td colspan="2">OIL FORCED LUBRICATED ARE COOLED BY AN EXTERNAL OIL LUBE SYSTEM</td></tr>
</table>

Bearing insulation

ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces.
Insulated antifriction bearings in standard configuration:
4, 6 poles: insulated ND end bearing from 630 frame size
8 poles: insulated bearing from 400 frame size
10 poles and above: insulated bearing from 500 frame size
All ND end sleeve bearings are insulated as standard.

Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system	Stator: H class insulated with a synthetic enamel (class F standard for generators with H>=800 or form wound form H=400. Class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific SCR. Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Inertia

All generators can be designed to meet specific inertia value also through flywheel. Values can be confirmed by contacting Marelli Motori.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
250	MARK V analog
315 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 900	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

Low voltage

	Size	Type
Low voltage	250 - 450 (4 poles)	Auxiliary winding
	400 - 450 (>4 poles)	Varicomp
	500 - 710 (all polarities)	Varicomp
	800 - 900	VARICOMP

Space heaters

Heaters installed at ND-end side.

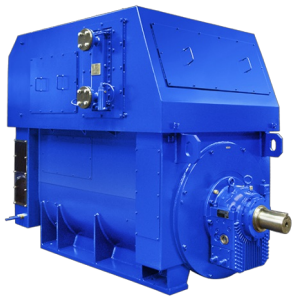
Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box. Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD for inlet / outlet water

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with runner neutral point terminals in separate terminal box increase protection degree up to IP 44 with filters dedicated design to couple the generator with existing baseframe air duct system to convey inlet / outlet cooling air redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system arrangement for vibration sensors lubrication system for sleeve bearing flywheel and locking device for dedicated inertia value brake system other options available on request.

MarelliMotori
Inspired solutions



MJHRM

Model	MJHRM
Power	Up to 11.000 kVA
Voltages	Up to 15.000 V
Frame	400 ÷ 1.250
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 81W
IP	IP 44. Available up to IP 56.
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled.
Main Applications	Propulsion generator, Shaft generator, Hybrid machine, Auxiliary generator, Off-shore and variable speed generator
Sector	Marine

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	10.000	9.000	11.000	11.000	10.000

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request.
Certificate	Marine Survey Certificate supplied with the machine. Marelli Motori has the ABS design assessment. Shaft, housing (propulsion) and exchanger are certified by the Marine Classification Society.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Motori generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083–2 C40–TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025 – S235 JR) depending upon application requirments.

Heat Exchanger	Construction Mounted on top of alternator. Double tube made of CuNi 90/10. Copper fins housing. Equipped with water leakage detector. Exchanger data Designed pressure 6 bar test pressure 10 bar power: up to 200 kW water flow: up to 18 m3/h max glycol: 30% type of water: fresh water or marine (salt) water flanges: PN6 – PN10 – Special (ANSI) Position can be adjusted to site conditions.
Construction	
Cooling System	IC 81W as per IEC60034-6. Primary fluid (water) is flowing by external water system. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Degree of protection	IP 44 as per IEC60034-5. (Available up to IP 56)
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses.
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction is available.

Bearing

General data

Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing.
The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours.
Locating bearings are on the D end side and floating bearings on the ND end side.

Bearing selection

Antifriction bearings up to 560 frame size included.
Sleeve bearings from 630 frame size included (available for smaller frame sizes) Antifriction bearings can be mounted on 630/710 frame size according to site working conditions.

Regreasing system (for antifriction bearing)

Both bearings are fitted with grease nipple.

Bearing insulation

ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces.
Insulated antifriction bearings in standard configuration:
4, 6 poles: insulated ND end bearing from 630 frame size
8 poles: insulated bearing from 400 frame size
10 poles: insulated bearing from 500 frame size
All ND end sleeve bearings are insulated as standard. All configurations are designed to withstand the following marine inclination.

Static		Dynamic	
List	15°	Rolling	±22.5°
Trim	5°	Pitch	±7.5°

Dedicated constructions available for different values.

Impregnation system

Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system

Stator: F class insulated with a synthetic enamel (class H option with BH technology).
Rotor: H class insulated with a synthetic enamel.

Protective treatments	Specific marine treatment. Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with an amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators comply with marine rules regarding transient performance. The voltage drop due to the application of 60% of nominal load is within 15%.
Three pahse short circuit current	All generators equipped with an overboosting device ensure a three phase short circuit current (Icc) higher than three times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
400 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 1.250	MEC 100 digital

Overboosting device

	Size	Type
Medium voltage	All	CT + Overboosting device
High voltage	All	PMG

Space heaters

Heaters installed at ND end side.

Size	Power (W)
400-560	400
630 - 710	600
800 - 900	800
1.000	1.000
1.120	1.200
1.250	1.400

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD for inlet / outlet water

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box terminal box inside air duct (internal terminal box) cooling system IC 86W with additional forced ventilation cooler mounted on side increase protection degree up to IP 54, IP 55 or IP 56 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.

MJRM

Model	MJRM
Power	Up to 6.500 kVA
Voltages	Up to 690 V
Frame	250 ± 900
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 81W/ IC 86W
IP	IP 44. Available up to IP 56.
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled.
Main Applications	Auxiliary generator, Hybrid machine, Off-shore and variable speed generator, Propulsion generator, Shaft generator
Sector	Marine

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	4.000	5.000	6.500	6.000	5.400

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request.
Certificate	Marine Survey Certificate supplied with the machine. Marelli Motori has the ABS design assessment. Shaft, housing (propulsion) and exchanger are certified by the Marine Classification Society.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Motori generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083–2 C40–TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025 – S235 JR) depending upon application requirments.

Heat Exchanger	Construction Mounted on top of alternator. Double tube made of CuNi 90/10. Copper fins housing. Equipped with water leakage detector. Exchanger data Designed pressure 6 bar test pressure 10 bar power: up to 200 kW water flow: up to 18 m3/h max glycol: 30% type of water: fresh water or marine (salt) water flanges: PN6 – PN10 – Special (ANSI) Position can be adjusted to site conditions.
Construction	
Cooling System	IC 81W as per IEC60034-6. Primary fluid (water) is flowing by external water system. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Degree of protection	IP 44 as per IEC60034-5. (Available up to IP 56)
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses.
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction is available.

MarelliMotori Marine

Bearing

General data

Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing.
The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours.
Locating bearings are on the D end side and floating bearings on the ND end side.

Bearing selection

Antifriction bearings up to 560 frame size included.
Sleeve bearings from 630 frame size included (available for smaller frame sizes).
Antifriction bearings can be mounted on 630/710 frame size according to site working conditions.

Regreasing system (for antifriction bearing)

Both bearings are fitted with grease nipple.

Bearing insulation

ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces.
Insulated antifriction bearings in standard configuration:
4, 6 poles: insulated ND end bearing from 630 frame size
8 poles: insulated bearing from 400 frame size
10 poles: insulated bearing from 500 frame size
All ND end sleeve bearings are insulated as standard. All configurations are designed to withstand the following marine inclination.

Static		Dynamic	
List	15°	Rolling	±22.5°
Trim	5°	Pitch	±7.5°

Dedicated constructions available for different values.

Impregnation system

Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system

Stator: H class insulated with a synthetic enamel (class F standard for generators with H>=800 or form wound form H=400. Class H option with BH technology).
Rotor: H class insulated with a synthetic enamel.

Protective treatments	Specific marine treatment. Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with an amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators comply with marine rules regarding transient performance. The voltage drop due to the application of 60% of nominal load is within 15%.
Three pahse short circuit current	All generators equipped with an overboosting device ensure a three phase short circuit current (Icc) higher than three times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
250	MARK V analog
315 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 900	MEC 100 digital

Overboosting device

	Size	Type
Low voltage	250 - 450 (4 poles)	Auxiliary winding
	400 - 450 (>4 poles)	Varicomp
	500 - 710 (all polarities)	Varicomp
	800 - 900	PMG

Space heaters

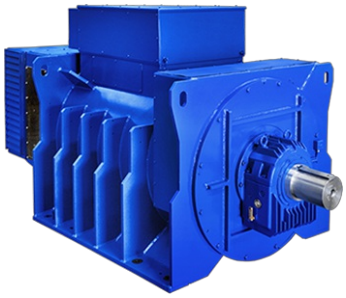
Heaters installed at ND end side.

Size	Power (W)
400-560	400
630 - 710	600
800 - 900	800

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD for inlet / outlet water

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box terminal box inside air duct (internal terminal box) cooling system IC 86W with additional forced ventilation cooler mounted on side increase protection degree up to IP 54, IP 55 or IP 56 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.



MJHM

Model	MJHM
Power	Up to 11.000 kVA
Voltages	Up to 15.000 V
Frame	400 ÷ 1.250
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 01
IP	IP 23. Available up to IP 44 with filters
Enclosure	ODP - Open Drip Proof
Main Applications	Auxiliary generator, Emergency, Hybrid machine, Off-shore and variable speed generator, Propulsion generator, Shaft generator
Sector	Marine

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	10.000	9.000	11.000	11.000	10.000

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request.
Certificate	Marine Survey Certificate supplied with the machine. Shaft, housing (propulsion) and exchanger are certified by the Marine Classification Society.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Motori generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083–2 C40–TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on top. Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025 – S235 JR) depending upon application requirments.

Construction	
Cooling System	IC 01 as per IEC60034-6
Degree of protection	IP 23 as per IEC60034-5
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses.
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction is available.

MarelliMotori Marine

Bearing

General data

Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing.
The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours.
Locating bearings are on the D end side and floating bearings on the ND end side.

Bearing selection

Antifriction bearings up to 560 frame size included.
Sleeve bearings from 630 frame size included (available for smaller frame sizes)
Antifriction bearings can be mounted on 630/710 frame size according to site working conditions.

Regreasing system (for antifriction bearing)

Both bearings are fitted with grease nipple.

Bearing insulation

ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces.
Insulated antifriction bearings in standard configuration:
4, 6 poles: insulated ND end bearing from 630 frame size
8 poles: insulated bearing from 400 frame size
10 poles: insulated bearing from 500 frame size
All ND end sleeve bearings are insulated as standard. All configurations are designed to withstand the following marine inclination.

Static		Dynamic	
List	15°	Rolling	±22.5°
Trim	5°	Pitch	±7.5°

Dedicated constructions available for different values.

Impregnation system

Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system

Stator: F class insulated with a synthetic enamel (class H option with BH technology).
Rotor: H class insulated with a synthetic enamel.

Protective treatments	Specific marine treatment. Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with an amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators comply with marine rules regarding transient performance. The voltage drop due to the application of 60% of nominal load is within 15%.
Three pahse short circuit current	All generators equipped with an overboosting device ensure a three phase short circuit current (Icc) higher than three times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
400 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 1.250	MEC 100 digital

Overboosting device

	Size	Type
Medium voltage	All	CT + Overboosting device
High voltage	All	PMG

Space heaters

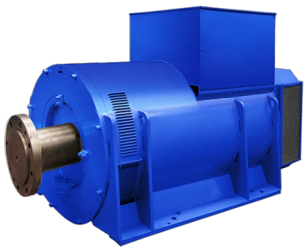
Heaters installed at ND end side.

Size	Power (W)
400-560	400
630 - 710	600
800 - 900	800
1.000	1.000
1.120	1.200
1.250	1.400

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box increase protection degree up to IP 44 with filters lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.



MJBM

Model	MJBM
Power	Up to 6.500 kVA
Voltages	Up to 690 V
Frame	160 ± 900
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 01
IP	IP 23. Available up to IP 44 with filters
Enclosure	ODP - Open Drip Proof
Main Applications	Auxiliary generator, Emergency, Hybrid machine, Off-shore, Propulsion generator, Shaft generator, Variable speed generator and emergency
Sector	Marine

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	4.000	5.000	6.500	6.000	5.400

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request.
Certificate	Marine Survey Certificate supplied with the machine. Marelli Motori is DNV type approved and has the ABS design assessment. Shaft, housing (propulsion) and exchanger are certified by the Marine Classification Society. SOLAS compliance declaration.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Motori generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083–2 C40–TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on top up to 630 frame size. Mounted on side from 710 frame size. Made of formable steels EN 10130.

Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025 – S235 JR) depending upon application requirements.
Construction	
Cooling System	IC 01 as per IEC60034-6
Degree of protection	IP 23 as per IEC60034-5
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses.
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction is available.

MarelliMotori Marine

Bearing

General data

Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing.
The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side.

Bearing selection

Antifriction bearings up to 560 frame size included.
Sleeve bearings from 630 frame size included (available for smaller frame sizes)
Antifriction bearings can be mounted on 630/710 frame size according to site working conditions.

Regreasing system (for antifriction bearing)

Both bearings are fitted with grease nipple.

Bearing insulation

ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces.
Insulated antifriction bearings in standard configuration:
4, 6 poles: insulated ND end bearing from 630 frame size
8 poles: insulated bearing from 400 frame size
10 poles: insulated bearing from 500 frame size
All ND end sleeve bearings are insulated as standard. All configurations are designed to withstand the following marine inclination.

Static		Dynamic	
List	15°	Rolling	±22.5°
Trim	5°	Pitch	±7.5°

Dedicated constructions available for different values.

Impregnation system

Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system

Stator: H class insulated with a synthetic enamel (class F standard for generators with H>=800 or form wound form H=400. Class H option with BH technology).
Rotor: H class insulated with a synthetic enamel.

Protective treatments	Specific marine treatment. Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with an amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators comply with marine rules regarding transient performance. The voltage drop due to the application of 60% of nominal load is within 15%.
Three pahse short circuit current	All generators equipped with an overboosting device ensure a three phase short circuit current (Icc) higher than three times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
160 - 250	MARK V analog
315 - 450	MEC 20 analog / digital
500 - 560	M40FA610A analog
630 - 710	M63FA310 analog
800 - 900	MEC 100 digital

Overboosting device

	Size	Type
Low voltage	160 - 450 (4 poles)	Auxiliary winding
	160 - 450 (>4 poles)	Varicomp
	500 - 710 (all polarities)	Varicomp
	800 - 900	PMG

Space heaters

Heaters installed at ND end side.

Size	Power (W)
400-560	400
630 - 710	600
800 - 900	800

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box increase protection degree up to IP 44 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.

MJVM

Model	MJVM
Power	Up to 5.500 kVA
Voltages	Up to 690 V
Frame	250 ± 900
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 611
IP	IP 44. Available up to IP 56
Enclosure	TEAAC – Totally Enclosed Air to Air Cooled
Main Applications	Emergency, Off-shore and emergency
Sector	Marine

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	3.500	4.300	5.600	5.600	4.600

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request.
Certificate	Marine Survey Certificate supplied with the machine. Shaft, housing (propulsion) and exchanger are certified by the Marine Classification Society.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Motori generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083–2 C40–TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025 – S235 JR) depending upon application requirements.

Internal Fan	Made of structural steel (EN 10025 - 5235 JR)
Heat Exchanger	Construction Mounted on top of alternator Tube made of P - AlMgSi UNI 3569 Housing: EN 10025 - 5235JR
Construction	
Cooling System	IC 611 as per IEC60034-6. Primary fluid (air) driven by a second fan (internal fan) mounted on shaft at ND end side. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Degree of protection	IP 44 as per IEC60034-5
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses.
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction is available.

Bearing

General data

Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing.
The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side.

Bearing selection

Antifriction bearings up to 560 frame size included.
Sleeve bearings from 630 frame size included (available for smaller frame sizes) Antifriction bearings can be mounted on 630/710 frame size according to site working conditions.

Regreasing system (for antifriction bearing)

Both bearings are fitted with grease nipple.

Bearing insulation

ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces.
Insulated antifriction bearings in standard configuration:
4, 6 poles: insulated ND end bearing from 630 frame size
8 poles: insulated bearing from 400 frame size
10 poles: insulated bearing from 500 frame size
All ND end sleeve bearings are insulated as standard. All configurations are designed to withstand the following marine inclination.

Static		Dynamic	
List	15°	Rolling	±22.5°
Trim	5°	Pitch	±7.5°

Dedicated constructions available for different values.

Impregnation system

Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system

Stator: H class insulated with a synthetic enamel (class F standard for generators with H>=800 or form wound form H=400. Class H option with BH technology).
Rotor: H class insulated with a synthetic enamel.

Protective treatments	Specific marine treatment. Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with an amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators comply with marine rules regarding transient performance. The voltage drop due to the application of 60% of nominal load is within 15%.
Three pahse short circuit current	All generators equipped with an overboosting device ensure a three phase short circuit current (Icc) higher than three times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
160 - 250	MARK V analog
315 - 450	MEC 20 analog / digital
500 - 560	M40FA610A analog
630 - 710	M63FA310 analog

Overboosting device

	Size	Type
Low voltage	160 - 450 (4 poles)	Auxiliary winding
	160 - 450 (>4 poles)	Varicomp
	500 - 710 (all polarities)	Varicomp
	800 - 900	PMG

Space heaters

Heaters installed at ND end side.

Size	Power (W)
400-560	400
630 - 710	600
800 - 900	800

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box. Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD into oil tank for sleeve beraing

Optional features	
List	Flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box cooling system IC 616 with additional forced ventilation increase protection degree up to IP 54, IP 55 or IP 56 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted generator other options available on request.

MarelliMotori
Oil & gas

MJB

Model	MJB
Power	Up to 6.500 kVA
Voltages	Up to 690 V
Frame	160 ± 900
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 01
IP	IP 23. Available up to IP 44 with filters.
Enclosure	ODP - Open Drip Proof
Main Applications	Auxiliary generators, Emergency, Power generation
Sector	Oil&Gas

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	5.000	5.000	6.500	6.000	5.400

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Adherence to ISO 8528 group G preformance classes.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on top up to 630 frame size. Mounted on side from 710 frame size. Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.

Construction	
Enclosure	ODP - Open Drip Proof
Cooling System	IC 01 as per IEC60034-6
Degree of protection	IP 23 as per IEC60034-5. Available up to IP 44 with filters.
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses.
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal. A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes). Regreasing system: Up to 250 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 315 - 355 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 400 frame size: D-end bearing is fitted with inner bearing cap and with gerase nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size 10 poles: insulated bearing from 500 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system	Stator: H class insulated with a synthetic enamel (class F standard for generators with H>=800 or form wound form H=400. Class H option with BH technology. Rotor: H class insulated with a synthetic enamel.
Protective treatments	Specific Oil&gas treatment. Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient performance	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.

MarelliMotori Oil & gas

Vibrations

Vibration level is in accordance with ISO 10816.
Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
160 - 250	MARK V analog
315 - 450	MEC 20 analog/digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 900	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

Low Voltage

	Size	Type
Low voltage	160 - 450 (4 poles)	Auxiliary winding
	160 - 450 (>4 poles)	Varicomp
	500 - 710 (all polarities)	Varicomp
	800 - 900	PMG

PMG available for all sizes on request.

Space heaters

Heaters installed at ND end side.

Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air

Optional features	
List	Flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box dedicated current transformer installed on neutral point (differential protection and measurement) increase protection degree up to IP 44 with filters dedicated lubrication unit for sleeve bearing solution lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type or included into digital regulation) digital AVR MEC100 for frame 250 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring other digital AVR available on request redundant AVR system excitation/overboosting PMG mounted on generator arrangement for earthing rotor fault protection 64R other options available on request.

MarelliMotori
Power generation

MXB-E

Model	MXB-E
Power	Up to 375 kVA
Voltages	Up to 480 V
Frame	160 ÷ 250
Poles	4
Cooling	IC01 as per IEC 60034-6
IP	IP 23 as per IEC60034-5 (up to IP 44 from 180 to 250 frame size)
Enclosure	ODP - Open Drip Proof
Main Applications	Data center, Emergency, Portable, PRP and COP, Stand-by, UPS
Sector	Power generation

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC 60034 - 1 BS 4999 - 5000 NEMA MG 1.32 Generators conform to EU rules UL 1004 - 1 (Certification pending) UL 1004 - 4 (Certification pending) C22.2 No. 100 (Certification pending)

Certificate	Test Certificate supplied with the machine Material certificates in accordance with EN 10204 : 2001 can be supplied on request
Main components	
Housing	Fabricated steel
Shield	N-End Endshield: Aluminium alloy (from 160 to 225 frame size) Cast iron (250 frame size)
Shaft	Carbon steel - hot rolled
Terminal board	Main terminal box Made of Bakelite 7-pins (from 160 to 180 frame size); 9-pins (from 225 to 250 frame size)
Fan	Plastic up to MXB-E 180 SC4 included - Aluminum alloy above
Construction	
Enclosure	ODP - Open Drip Proof
Cooling System	IC01 as per IEC 60034-6
Degree of protection	IP 23 as per IEC60034-5 (up to IP 44 from 180 to 250 frame size)
Mounting	Horizontal single bearing (160 frame size) Horizontal single bearing - double bearing available on request from 180 to 250 frame size
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type Made by copper wire H class insulated with enamel coating Winding retaining by pass-through bars of high quality steel Rotating rectifier: Graetz diode bridge with 6 diodes Rotors are dynamically balanced

Bearing	General data Single or double antifriction bearing grease lubricated (ball type) Bearing lifetime >=20'000 hours
Impregnation system	Epoxy resin through high quality process
Insulation system	Class H for stator and rotor
Protective treatments	Standard impregnation with epoxy resin through high quality process CW1081 on request
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less
Parallel operations	All generators are provided with an amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit (available on 180, 225 and 250 frame size)
Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori
Three pahse short circuit current	Generators with auxiliary windings or PMG ensure a three phase short-circuit current (Icc) higher than 3 times the rated current (in): Icc > 3 In for 10 seconds
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011
THD (Total Harmonic Distortion) / THF	Typically THD < 2% at no load / THF < 2%
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14

MarelliMotori Power generation

Regulation

AVR model	AVR code : 11000013 - M00FA122A AVR Model : MARK VX Dedicated AVR for optional PMG
AVR position	160 - 180 frame size: on left side viewed from D-End 225 - 250 frame size: front mounted
AVR supply	Mains. PMG or Auxiliary winding on request
Voltage sensing	Single phase
Accuracy	± 0,5% (@rated load, balanced and not deforming, P.F. 0,8)
EMI filter	Included
Limiters	U/F Under Frequency

Optional features

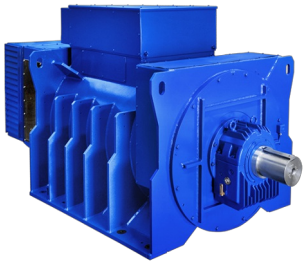
Options available

MXB-E series

	160	180	225	250
Operating conditions				
Special voltage	o	o	o	o
Provision for parallel operation with similar generators with AVR (MEC 20)	n/a	o*	o	o
Terminal box				
IP55 terminal box	o	o	o	o(1)
Large terminal box	n/a	o	n/a	n/a
Separate auxiliary terminal box	n/a	o	o	o
Non-magnetic exit cable panel	n/a	n/a	n/a	o
6-leads winding	n/a	n/a	n/a	o
Heating				
Anti-condensation heaters (V=220 V)	o	o	o	o
Temperature sensors				
N. 3 PTC thermistors	o	o	o	o
N. 3 PT100 resistance temperature detectors in stator winding	n/a	o	o	o

N. 1 PT100 on N-End bearing	o	o	o	o
N. 1 PT100 on D-End bearing (for double bearing configuration)	n/a	o	o	o
N. 1 PT100 duplex type on N-End bearing	n/a	o	o	o
N. 1 PT100 duplex type on D-End bearing (for double bearing configuration)	n/a	o	o	o
Protection degree				
Inlet filter	n/a	o	o	o
Inlet + outlet filter (IP43)	n/a	o	o	o
Inlet + outlet filter (IP44)	n/a	o	o	o
AVR				
Single-phase sensing AVR (Mark VX), side mounted	s	s	o	o
Single-phase sensing AVR (Mark VX), front mounted	n/a	o*	s	s
Three-phase sensing AVR (MEC-20), side mounted	n/a	o*	o	o
Three-phase sensing AVR (MEC-20), front mounted	n/a	o*	n/a	o
Digital AVR D-Vo (mounted on board)	n/a	n/a	n/a	o
Automatic power factor regulator (mounted on board)	n/a	n/a	n/a	o
Painting				
Special painting cycle (MM ref. F96831)	o	o	o	o
Painting colour different from RAL 9005 and RAL 5010	o	o	o	o
Painting colour RAL 9005 Black or RAL 5010 Blue (standard alternator not painted)	o	o	o	o
Special painting cycle (MM ref. F96819)	o	o	o	o
Special painting cycle (MM ref. F96826)	o	o	o	o
Environmental solutions				
Tropicalization (CW1081)	o	o	o	o
Excitation system				
Auxiliary winding	o	o	o	o
PMG with single-phase AVR (Mark XX) side mounted	o	o	o	n/a
PMG with single-phase AVR (Mark XX)				

front mounted	n/a	o*	o	n/a
PMG with three-phase AVR (MEC-20) side mounted	n/a	o*	o	o
PMG with three-phase AVR (MEC-20) front mounted	n/a	o*	n/a	o
PMG with digital AVR D-Vo (mounted on board)	n/a	n/a	n/a	o
Mechanical configuration				
Special shaft extension	n/a	n/a	n/a	o
Second shaft extension (as per catalogue)	n/a	n/a	n/a	o
Special housing (2)	n/a	o	o	o
NDE grease nipple	n/a	n/a	n/a	o
DE grease nipple	n/a	n/a	n/a	o
Other accessories				
N. 3 CT single core on neutral point (low voltage)	n/a	n/a	n/a	o
(*) this option includes also large terminal box *(1) On H class overtemperature a 10% derating must be applied* *(2) Based on volumes*				
	o: optional | **n/a:** not available | **s:** standard			



MJH

Model	MJH
Power	Up to 12.500 kVA
Voltages	Up to 15.000 V
Frame	400 ± 1.250
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 01
IP	IP 23. Available up to IP 44 with filters.
Enclosure	ODP - Open Drip Proof
Main Applications	Auxiliary generators, Emergency, Power generation
Sector	Oil&Gas

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	10.000	12.500	12.500	12.500	10.000

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Adherence to ISO 8528 group G preformance classes.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083–2 C40–TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested to ensure defect-free performance. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on top. Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025 – S235 JR) depending upon application requirements.
Construction	
Enclosure	ODP - Open Drip Proof

Cooling System	IC 01 as per IEC60034-6
Degree of protection	IP 23 as per IEC60034-5. Available up to IP 44 with filters.
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes). Regreasing system: Up to 400 frame size: D-end bearing is fitted with inner bearing cap and with grease nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size 10 poles: insulated bearing from 500 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.
Insulation system	Stator: F class insulated with a synthetic enamel (class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Specific Oil&gas treatment. Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.

Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient performance	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
400 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 1250	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

	Size	Type
Medium Voltage	All	CT + Overboosting device
High voltage	All	PMG

PMG available for all sizes on request.

Space heaters

Heaters installed at ND-end side.

Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800
1000	1000
1120	1200
1250	1400

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air

Optional features	
List	Flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box dedicated current transformer installed on neutral point (differential protection and measurement) increase protection degree up to IP 44 with filters dedicated lubrication unit for sleeve bearing solution lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type or included into digital regulation) digital AVR MEC100 for frame 250 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring other digital AVR available on request redundant AVR system excitation/overboosting PMG mounted on generator arrangement for earthing rotor fault protection 64R other options available on request.

MarelliMotori
Oil & gas

MJV

Model	MJV
Power	Up to 4.550 kVA
Voltages	Up to 690 V
Frame	250 ± 900
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 611
IP	IP 55. Available up to IP 56.
Enclosure	TEAAC – Totally Enclosed Air to Air Cooled
Main Applications	Auxiliary generators, Emergency, Power generation
Sector	Oil&Gas

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	3.500	4.550	4.550	4.550	4.000

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Adherence to ISO 8528 group G preformance classes.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – N). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.
Internal Fan	Made of structural steel (EN 10025 - 5235 JR)

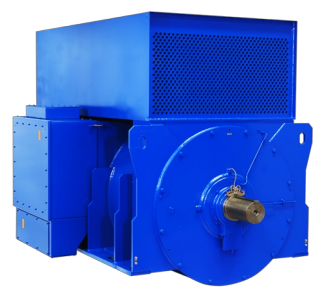
Heat Exchanger	Construction Mounted on top of alternator Tube made of P - AlMgSi UNI 3569 Housing: EN 10025 - 5235JR
Construction	
Cooling System	IC 611 as per IEC60034-6. Primary fluid (air) driven by a second fan (internal fan) mounted on shaft at ND end side. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Operating temperature	Up to 60° C ambient temperature (over contact Marelli Motori)
Degree of protection	IP 55 as per IEC60034-5. Other protection degree available on request.
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes). Regreasing system: Up to 250 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 315 - 355 frame size: D-end bearing is fitted with inner bearing cap and with gerase nipple ND-end bearing is with shield (2Z) without regreasing system 400 frame size: D-end bearing is fitted with inner bearing cap and with gerase nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size 10 poles: insulated bearing from 500 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system	Stator: H class insulated with a synthetic enamel (class F standard for generators with H>=800 or form wound form H=400. Class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Specific Oil&gas treatment. Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient performance	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than three times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.

Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.
Auxiliary device	
AVR	Automatic voltage regulator mounted on board. Size: Type 250: MARK V analog 315 - 450: MEC 20 analog/ digital 500 - 560: M40FA610A analog 630 - 710: M63FA310A analog 800 - 900: M63FA310A analog Digital AVR available for all sizes on request.
Overboosting device	Low voltage Low voltage: Size: 250 - 450 (4 poles): Type: Auxiliary winding Size: 400 - 450 (>4 poles): Type: Varicomp Size: 500 - 710 (all polarities): Type: Varicomp Size: 800 - 900: Type: PMG PMG available for all sizes on request.
Space heaters	Heaters installed at ND-end side. Size: Power(W) 400 - 560: 400 630 - 710: 600 800 - 900: 800
RTD-PT100	RTD devices in standard configuration: 1+1 RTD on each phase of stator winding 1 RTD on each bearing Terminals in auxiliary terminal box. Other configurations available: DUPLEX type RTD for inlet / outlet air RTD into oil tank for sleeve bearing

Optional features	
List	Flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box dedicated current transformer installed on neutral point (differential protection and measurement) cooling system IC 616 with additional forced ventilation increase protection degree up to IP 56 with filters dedicated lubrication unit for sleeve bearing solution lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type or included into digital regulation) digital AVR MEC100 for frame 250 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring other digital AVR available on request redundant AVR system excitation/overboosting PMG mounted on generator arrangement for earthing rotor fault protection 64R other options available on request.



MJHV

Model	MJHV
Power	Up to 8.750 kVA
Voltages	Up to 15.000 V
Frame	400 ± 1250
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 611
IP	IP 55. Available up to IP 56
Enclosure	TEAAC – Totally Enclosed Air to Air Cooled
Main Applications	Auxiliary generators, Emergency, Power generation
Sector	Oil&Gas

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	7.000	8.750	8.750	8.750	7.000

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Adherence to ISO 8528 group G preformance classes.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested by the manufacturer to ensure it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.
Internal Fan	Made of structural steel (EN 10025 - 5235 JR)

Heat Exchanger	Construction Mounted on top of alternator Tube made of P - AlMgSi UNI 3569 Housing: EN 10025 - 5235JR
Construction	
Cooling System	IC 611 as per IEC60034-6. Primary fluid (air) driven by a second fan (internal fan) mounted on shaft at ND end side. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Operating temperature	Up to 60° C ambient temperature (over contact Marelli Motori)
Degree of protection	IP 55 as per IEC60034-5 Other protection degree available on request
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes). Regreasing system: Up to 400 frame size: D-end bearing is fitted with inner bearing cap and with grease nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size 10 poles: insulated bearing from 500 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.
Insulation system	Stator: F class insulated with a synthetic enamel (class H option with BH technology. Rotor: H class insulated with a synthetic enamel.
Protective treatments	Specific Oil&gas treatment. Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.

Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient performance	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than three times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
400 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 1.250	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

	Size	Type
Medium Voltage	All	CT + Overboosting device
High voltage	All	PMG

PMG available for all sizes on request.

Space heaters

Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800
1.000	1.000
1.120	1.200
1.250	1.400

Heaters installed at ND-end side.

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD into oil tank for sleeve bearing

Optional features	
List	Flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box dedicated current transformer installed on neutral point (differential protection and measurement) cooling system IC 616 with additional forced ventilation increase protection degree up to IP 56 with filters dedicated lubrication unit for sleeve bearing solution lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type or included into digital regulation) digital AVR MEC100 for frame 250 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring other digital AVR available on request redundant AVR system excitation/overboosting PMG mounted on generator arrangement for earthing rotor fault protection 64R other options available on request.

MarelliMotori
Power generation

MJB

Model	MJB
Power	Up to 6.500 kVA
Voltages	Up to 690 V
Frame	160 ± 900
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 01
IP	IP 23. Available up to IP 44 with filters.
Enclosure	ODP - Open Drip Proof
Main Applications	Data center, Emergency, PRP and COP, Stand-by, UPS
Sector	Power generation

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	5.000	5.000	6.500	6.000	5.400

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Aderence to ISO 8528 group G preformance classes.
Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on top up to 630 frame size. Mounted on side from 710 frame size. Made of formable steels EN 10130.

Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.
Construction	
Cooling System	IC 01 as per IEC60034-6
Degree of protection	IP 23 as per IEC60034-5
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes). Regreasing system: Up to 250 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 315 - 355 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 400 frame size: D-end bearing is fitted with inner bearing cap and with gerase nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size 10 poles: insulated bearing from 500 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system	Stator: H class insulated with a synthetic enamel (class F standard for generators with H>=800 or form wound form H=400. Class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.

Vibrations

Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
160 - 250	MARK V analog
315 - 450	MEC 20 analog/digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 900	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

Low Voltage

	Size	Type
Low voltage	160 - 450 (4 poles)	Auxiliary winding
	160 - 450 (>4 poles)	Varicomp
	500 - 710 (all polarities)	Varicomp
	800 - 900	PMG

Space heaters

Heaters installed at ND end side.

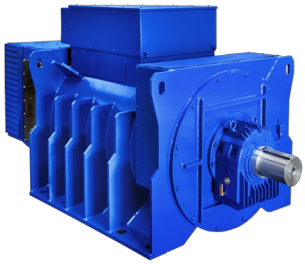
Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box increase protection degree up to IP 44 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.

MarelliMotori
Power generation



MJH

Model	MJH
Power	Up to 14.000 kVA
Voltages	Up to 15.000 V
Frame	400 ± 1.250
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 01
IP	IP 23. Available up to IP 44 with filters.
Enclosure	ODP - Open Drip Proof
Main Applications	Data center, Emergency, PRP and COP, Stand-by, UPS
Sector	Power generation

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	10.000	12.500	12.500	12.500	10.000

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Aderence to ISO 8528 group G preformance classes.
Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested to ensure defect-free performance. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on top. Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.

Construction	
Enclosure	ODP - Open Drip Proof
Cooling System	IC 01 as per IEC60034-6
Degree of protection	IP 23 as per IEC60034-5
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes). Regreasing system: Up to 400 frame size: D-end bearing is fitted with inner bearing cap and with gerase nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size 10 poles: insulated bearing from 500 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.
Insulation system	Stator: F class insulated with a synthetic enamel (class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.

Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
400 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 1250	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

	Size	Type
Medium Voltage	All	CT + Overboosting device
High voltage	All	PMG

Space heaters

Heaters installed at ND-end side.

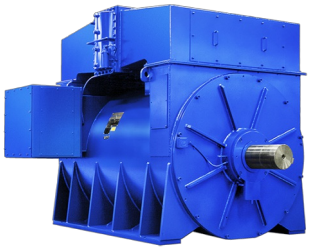
Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800
1000	1000
1120	1200
1250	1400

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box increase protection degree up to IP 44 with filters lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.

MarelliMotori
Power generation



MJR

Model	MJR
Power	Up to 6.000 kVA
Voltages	Up to 690 V
Frame	250 ± 900
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 81W/ IC 86W
IP	IP 44. Available up to IP 56.
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled
Main Applications	PRP and COP
Sector	Power generation

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	4.600	5.000	6.000	6.000	5.400

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Aderence to ISO 8528 group G preformance classes.
Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – N). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.

Heat Exchanger	Construction Mounted on top of alternator. Double tube made of CuNi 90/10. Copper fins housing. Equipped with water leakage detector. Exchanger data Designed pressure 6 bar Test pressure 10 bar Power: up to 200 kW Water flow: up to 18 m3/h Max glycol: 30% Type of water: fresh water or marine (salt) water Flanges: PN6 – PN10 – Special (ANSI) Position can be adjusted to site conditions
Construction	
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled
Cooling System	IC81W as per IEC60034-6. Primary fluid (water) is flowing by external water system. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Degree of protection	IP 44 as per IEC60034-5. (Available up to IP 56)
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 560 frame size included. Sleeve bearings from 630 frame size included (available for smaller frame sizes). Regreasing system: Up to 250 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 315 - 355 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 400 frame size: D-end bearing is fitted with inner bearing cap and with gerase nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size 10 poles: insulated bearing from 500 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system	Stator: H class insulated with a synthetic enamel (class F standard for generators with H>=800 or form wound form H=400. Class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.

Vibrations

Vibration level is in accordance with ISO 10816.
Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
250	MARK V analog
315 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 900	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

Low voltage

	Size	Type
Low voltage	250 - 450 (4 poles)	Auxiliary winding
	400 - 450 (>4 poles)	Varicomp
	500 - 710 (all polarities)	Varicomp
	800 - 900	PMG

Space heaters

Heaters installed at ND-end side.

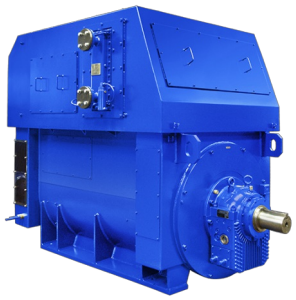
Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD for inlet / outlet water

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box terminal box inside air duct (internal terminal box) cooling system IC 86W with additional forced ventilation cooler mounted on side increase protection degree up to IP 54, IP 55 or IP 56 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.

MarelliMotori
Power generation



MJHR

Model	MJHR
Power	Up to 12.500 kVA
Voltages	Up to 15.000 V
Frame	400 ÷ 1.250
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 81W
IP	IP 44. Available up to IP 56.
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled
Main Applications	PRP
Sector	Power generation

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	10.000	12.500	12.500	12.500	10.000

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Aderence to ISO 8528 group G preformance classes.
Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.

Heat Exchanger	Construction Mounted on top of alternator. Double tube made of CuNi 90/10. Copper fins housing. Equipped with water leakage detector. Exchanger data Designed pressure 6 bar Test pressure 10 bar Power: up to 200 kW Water flow: up to 18 m3/h Max glycol: 30% Type of water: fresh water or marine (salt) water Flanges: PN6 – PN10 – Special (ANSI) Position can be adjusted to site conditions.
Construction	
Cooling System	IC81W as per IEC60034-6. Primary fluid (water) is flowing by external water system. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Degree of protection	IP 44 as per IEC60034-5. (Available up to IP 56)
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes) Regreasing system: Up to 400 frame size: D-end bearing is fitted with inner bearing cap and with grease nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size 10 poles: insulated bearing from 500 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.
Insulation system	Stator: F class insulated with a synthetic enamel (class F standard for low voltage generators from 800 to 1250 frame size), (class H option for low, medium and high voltage generator with BH technology). Rotor: H class insulated with a synthetic enamel.

Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
400 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 1.250	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

	Size	Type
Medium Voltage	All	CT + Overboosting device
High voltage	All	PMG

Space heaters

Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800
1.000	1.000
1.120	1.200
1.250	1.400

Heaters installed at ND-end side.

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD for inlet / outlet water

Optional features	
List	Reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box terminal box inside air duct (internal terminal box) cooling system IC 86W with additional forced ventilation cooler mounted on side increase protection degree up to IP 54, IP 55 or IP 56 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.

MarelliMotori
Power generation

MJV

Model	MJV
Power	Up to 4.550 kVA
Voltages	Up to 690 V
Frame	250 ± 900
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 611
IP	IP 44. Available up to IP 56.
Enclosure	TEAAC – Totally Enclosed Air to Air Cooled
Main Applications	Emergency
Sector	Power generation

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	3.500	4.550	4.550	4.550	4.000

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Aderence to ISO 8528 group G preformance classes.
Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – N). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.
Internal Fan	Made of structural steel (EN 10025 - 5235 JR)

Heat Exchanger	Construction Mounted on top of alternator Tube made of P - AlMgSi UNI 3569 Housing: EN 10025 - 5235JR
Construction	
Cooling System	IC 611 as per IEC60034-6. Primary fluid (air) driven by a second fan (internal fan) mounted on shaft at ND end side. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Degree of protection	IP 44 as per IEC60034-5
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes). Regreasing system: Up to 250 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 315 - 355 frame size: D-end bearing is fitted with inner bearing cap and with gerase nipple ND-end bearing is with shield (2Z) without regreasing system 400 frame size: D-end bearing is fitted with inner bearing cap and with gerase nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size 10 poles: insulated bearing from 500 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system	Stator: H class insulated with a synthetic enamel (class F standard for generators with H>=800 or form wound form H=400. Class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.

Vibrations

Vibration level is in accordance with ISO 10816.
Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
250	MARK V analog
315 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog

Digital AVR available for all sizes on request.

Overboosting device

Low voltage

	Size	Type
Low voltage	250 - 450 (4 poles)	Auxiliary winding
	400 - 450 (>4 poles)	Varicomp
	500 - 710 (all polarities)	Varicomp
	800 - 900	PMG

Space heaters

Heaters installed at ND-end side.

Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD into oil tank for sleeve bearing

Optional features	
List	Flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box cooling system IC 616 with additional forced ventilation increase protection degree up to IP 54, IP 55 or IP 56 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted generator other options available on request.

MarelliMotori
Power generation

MJHV

Model	MJHV
Power	Up to 8.750 kVA
Voltages	Up to 15.000 V
Frame	400 ± 1250
Poles	4, 6, 8, 10 and 12 (over contact MM)
Cooling	IC 611
IP	IP 55. Available up to IP 56
Enclosure	TEAAC – Totally Enclosed Air to Air Cooled
Main Applications	Emergency
Sector	Power generation

Poles	**4 Poles**	**6 Poles**	**8 Poles**	**10 Poles**	**12 Poles**
| kVA | 60 Hz	7.000	8.750	8.750	8.750	7.000

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Aderence to ISO 8528 group G preformance classes.
Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – N). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.
Internal Fan	Made of structural steel (EN 10025 - 5235 JR)

Heat Exchanger	Construction Mounted on top of alternator Tube made of P - AlMgSi UNI 3569 Housing: EN 10025 - 5235JR
Construction	
Cooling System	IC 611 as per IEC60034-6. Primary fluid (air) driven by a second fan (internal fan) mounted on shaft at ND end side. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Degree of protection	IP 55 as per IEC60034-5
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes). Regreasing system: Up to 400 frame size: D-end bearing is fitted with inner bearing cap and with grease nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size 10 poles: insulated bearing from 500 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.
Insulation system	Stator: F class insulated with a synthetic enamel (class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.

Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
400 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 1.250	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

	Size	Type
Medium Voltage	All	CT + Overboosting device
High voltage	All	PMG

Space heaters

Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800
1.000	1.000
1.120	1.200
1.250	1.400

Heaters installed at ND-end side.

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD into oil tank for sleeve bearing

Optional features	
List	Flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box cooling system IC 616 with additional forced ventilation increase protection degree up to IP 54, IP 55 or IP 56 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted generator other options available on request.

MarelliMotori
Power generation

MXB

Model	MXB
Power	Up to 375 kVA
Voltages	Up to 480 V
Frame	160 ÷ 250
Poles	4
Cooling	IC01 as per IEC 60034-6
IP	IP23 as per IEC 60034-5 (up to IP 44)
Enclosure	ODP - Open Drip Proof
Main Applications	Data center, Emergency, Portable, PRP and COP, Stand-by, UPS
Sector	Power generation

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC 60034 - 1 CEI 2-3 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules UL 1004 - 1 UL 1004 - 4 C22.2 No. 100
Certificate	Test Certificate supplied with the machine Material certificates in accordance with EN 10204 : 2001 can be supplied
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR) Frame is provided with side ribs to increase the strength Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3
Shield NDE	Aluminium alloy 46100S T6 (from 160 to 225 frame size) Cast iron GJL 300 (250 frame size)
Shaft	Carbon steel - hot rolled (EN 10025 - S355 JR)
Terminal board	Made of Bakelite PF2736 7-pins (from 160 to 180 frame size) 9-pins (from 225 to 250 frame size)
Fan	PA 6.6 up to MXB 180 SC4 included - Aluminum alloy above
Construction	
Cooling System	IC01 as per IEC 60034-6
Degree of protection	IP 23 as per IEC60034-5 (up to IP 44 from 180 to 250 frame size)

Mounting	Horizontal single bearing (160 frame size) Horizontal single bearing - IM 2105 from 180 to 250 frame size (double bearing available on request)
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type Made by copper wire H class insulated with enamel coating Winding retaining by pass-through bars of high quality steel Rotating rectifier: Graetz diode bridge with 6 diodes Rotors are dynamically balanced
Bearing	General data Single or double antifriction bearing grease lubricated (ball type) Bearing lifetime >=20'000 hours Bearing selection Antifriction bearings
Impregnation system	Epoxy resin through high quality process
Insulation system	Class H for stator and rotor
Protective treatments	Standard impregnation with epoxy resin through high quality process CW1081 on request
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less
Parallel operations	All generators are provided with an amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit (available on 180, 225 and 250 frame size)

Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori
Three pahse short circuit current	Generators with auxiliary windings or PMG ensure a three phase short-circuit current (Icc) higher than 3 times the rated current (in): Icc > 3 In for 10 seconds
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011
THD (Total Harmonic Distortion) / THF	The no-load voltage wave form is sinusoidal with THD content less than 2% / THF < 2%
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14
Auxiliary device	
AVR model	AVR model 11000013 - MARK VX Dedicated AVR for optional PMG
AVR position	On right side viewed from D-End 225 - 250 frame size front mounted
AVR supply	Auxiliary winding
Voltage sensing	Single phase
Accuracy	± 0,5% (@rated load, balanced and not deforming, P.F. 0,8)
EMI filter	Included
Limiters	U/F Under Frequency
Optional features	

Options available

	160	180	225	250
Operating conditions				
Special voltage including 380V, R3, R6 (LV only)	o	o	o	o
Provision for parallel operation with similar	n/a	o*	o	o

generators with AVR				
Terminal box				
IP55 terminal box	o	o	o	o
Large terminal box	n/a	o	n/a	n/a
Separate auxiliary terminal box	n/a	o	o	o
Non-magnetic exit cable panel	n/a	n/a	n/a	o
6-leads winding	n/a	n/a	n/a	o
Heating				
Anti-condensation heaters (V=220 V)	o	o	o	o
Temperature sensors				
N. 3 PTC thermistors	o	o	o	o
N. 3 PT100 resistance temperature detectors in stator winding	n/a	o	o	o
N. 1 PT100 on N-End bearing	o	o	o	o
N. 1 PT100 on D-End bearing (for double bearing configuration)	n/a	o	o	o
N. 1 PT100 duplex type on N-End bearing	n/a	o	o	o
N. 1 PT100 duplex type on D-End bearing (for double bearing configuration)	n/a	o	o	o
N. 1 PT100 air inlet	n/a	n/a	n/a	o
N. 1 PT100 air outlet	n/a	n/a	n/a	o
Protection degree				
Inlet filter	n/a	o	o	o
Inlet + outlet filter (IP43)	n/a	o	o	o
Inlet + outlet filter (IP44)	n/a	o	o	o
Air to fresh water heat exchanger top mounted on generator (IP44)	n/a	n/a	n/a	o
Air to salt water heat exchanger top mounted on generator (IP44)	n/a	n/a	n/a	o
Air to air heat exchanger top mounted on generator	n/a	n/a	n/a	o
AVR				
Single-phase sensing AVR (Mark VX), side mounted	s	s	o	o

Single-phase sensing AVR (Mark VX), front mounted	n/a	o*	s	s
Three-phase sensing AVR (MEC-20), side mounted	n/a	o*	o	o
Three-phase sensing AVR (MEC-20), front mounted	n/a	o*	n/a	o
Digital AVR D-Vo (mounted on board)	n/a	n/a	n/a	o
Automatic power factor regulator (mounted on board)	n/a	n/a	n/a	o
Painting				
Non standard colour (MM ref. F96831)	o	o	o	o
Special painting cycle (MM ref. F96819)	o	o	o	o
Special painting cycle (MM ref. F96826)	o	o	o	o
Environmental solutions				
Tropicalization (CW1081)	o	o	o	o
Excitation system				
PMG with single-phase AVR (Mark XX) side mounted	o	o	o	o
PMG with single-phase AVR (Mark XX) front mounted	n/a	o*	o	o
PMG with three-phase AVR (MEC-20) side mounted	n/a	o*	o	o
PMG with three-phase AVR (MEC-20) front mounted	n/a	o*	n/a	o
PMG with digital AVR D-Vo (mounted on board)	n/a	n/a	n/a	o
Mechanical configuration				
Special shaft extension	n/a	n/a	n/a	o
Second shaft extension (as per catalogue)	n/a	n/a	n/a	o
Special housing	n/a	n/a	n/a	o
Neutral point terminal box for B2-B3-B34 construction	n/a	n/a	n/a	o
NDE grease nipple	n/a	n/a	n/a	o
DE grease nipple	n/a	n/a	n/a	o

Other accessories				
Toothed wheel (n.60 teeth) with provision for speed sensor (sensor not included)	n/a	n/a	n/a	o
64R - Brush connection with rotor for earth fault detection (without protection device)	n/a	n/a	n/a	o
N. 3 CT single core on neutral point (low voltage)	n/a	n/a	n/a	o
(*) this option includes also large terminal box				
	o: optional | **n/a:** not available | **s:** standard			

MarelliMotori Cogeneration

MJB

Model	MJB
Power	Up to 6.500 kVA
Voltages	Up to 690 V
Frame	160 ± 900
Poles	4, 6 and 8 (over contact MM)
Cooling	IC 01
IP	IP 23. Available up to IP 44 with filters.
Enclosure	ODP - Open Drip Proof
Main Applications	Internal combustion engines, Steam & GAS Turbines
Sector	Cogeneration

Poles	**4 Poles**	**6 Poles**	**8 Poles**		
| kVA 60 | Hz	5.000	5.000	6.500		

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Aderence to ISO 8528 group G preformance classes.
Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on top up to 630 frame size. Mounted on side from 710 frame size. Made of formable steels EN 10130.

Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.
Construction	
Enclosure	ODP - Open Drip Proof
Cooling System	IC 01 as per IEC60034-6
Degree of protection	IP 23 as per IEC60034-5
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes). Regreasing system: Up to 250 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 315 - 355 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 400 frame size: D-end bearing is fitted with inner bearing cap and with gerase nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system	Stator: H class insulated with a synthetic enamel (class F standard for generators at 400V form wound from 400 to 1250 frame size and for low voltage generators from 800 to 1250 frame size). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.

Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.
Auxiliary device	
AVR	Automatic voltage regulator mounted on board.

Size	Type
160 - 250	MARK V analog
315 - 450	MEC 20 analog/digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 900	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

Low Voltage

	Size	Type
Low voltage	160 - 450 (4 poles)	Auxiliary winding
	160 - 450 (>4 poles)	Varicomp
	500 - 710 (all polarities)	Varicomp
	800 - 900	PMG

Space heaters

Heaters installed at ND end side.

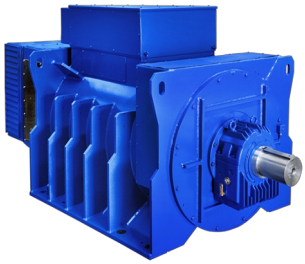
Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air

Optional features	
List	Low losses magnetic steel reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box increase protection degree up to IP 44 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.

MarelliMotori Cogeneration



MJH

Model	MJH
Power	Up to 12.500 kVA
Voltages	Up to 15.000 V
Frame	400 ± 1.250
Poles	4, 6, 8 (over contact MM)
Cooling	IC 01
IP	IP 23. Available up to IP 44 with filters.
Enclosure	ODP - Open Drip Proof
Main Applications	Internal combustion engines, Steam & GAS Turbines
Sector	Cogeneration

Poles	**4 Poles**	**6 Poles**	**8 Poles**		
| kVA | 60 Hz	10.000	12.500	12.500		

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Aderence to ISO 8528 group G preformance classes.
Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – TN). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested to ensure defect-free performance. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on top. Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.

Construction	
Enclosure	ODP - Open Drip Proof
Cooling System	IC 01 as per IEC60034-6
Degree of protection	IP 23 as per IEC60034-5
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes). Regreasing system: Up to 400 frame size: D-end bearing is fitted with inner bearing cap and without grease nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.
Insulation system	Stator: F class insulated with a synthetic enamel (class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.

Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
400 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 1250	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

	Size	Type
Medium Voltage	All	CT + Overboosting device
High voltage	All	PMG

Space heaters

Heaters installed at ND-end side.

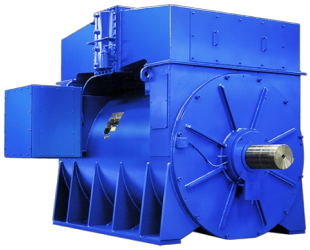
Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800
1000	1000
1120	1200
1250	1400

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air

Optional features	
List	Low losses magnetic steel reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box increase protection degree up to IP 44 with filters lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.

MarelliMotori Cogeneration



MJR

Model	MJR
Power	Up to 6.000 kVA
Voltages	Up to 690 V
Frame	250 ± 900
Poles	4, 6, 8 (over contact MM)
Cooling	IC 81W/ IC 86W
IP	IP 44. Available up to IP 56.
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled
Main Applications	Steam & GAS Turbines
Sector	Cogeneration

Poles	**4 Poles**	**6 Poles**	**8 Poles**		
| kVA | 60 Hz	4.600	5.000	6.000		

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Aderence to ISO 8528 group G preformance classes.
Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – N). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.

Heat Exchanger	Construction Mounted on top of alternator. Double tube made of CuNi 90/10. Copper fins housing. Equipped with water leakage detector. Exchanger data Designed pressure 6 bar Test pressure 10 bar Power: up to 200 kW Water flow: up to 18 m3/h Max glycol: 30% Type of water: fresh water or marine (salt) water Flanges: PN6 – PN10 – Special (ANSI) Position can be adjusted to site conditions
Construction	
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled
Cooling System	IC81W as per IEC60034-6. Primary fluid (water) is flowing by external water system. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Degree of protection	IP 44 as per IEC60034-5. (Available up to IP 56)
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 560 frame size included. Sleeve bearings from 630 frame size included (available for smaller frame sizes). Regreasing system: Up to 250 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 315 - 355 frame size: D-end bearing is prelubricated with inner bearing cap and without grease nipple ND-end bearing is with shield (2Z) without regreasing system 400 frame size: D-end bearing is fitted with inner bearing cap and with gerase nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size 10 poles: insulated bearing from 500 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.

Insulation system	Stator: H class insulated with a synthetic enamel (class F standard for generators at 400V form wound form 400 to 1250 frame size and for low voltage generators from 800 to 1250 frame size). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.
Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.

Vibrations

Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
250	MARK V analog
315 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 900	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

Low voltage

	Size	Type
Low voltage	250 - 450 (4 poles)	Auxiliary winding
	400 - 450 (>4 poles)	Varicomp
	500 - 710 (all polarities)	Varicomp
	800 - 900	PMG

Space heaters

Heaters installed at ND-end side.

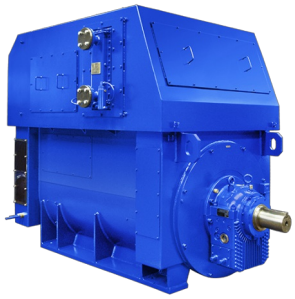
Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD for inlet / outlet water

Optional features	
List	Low losses magnetic steel reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box terminal box inside air duct (internal terminal box) cooling system IC 86W with additional forced ventilation cooler mounted on side increase protection degree up to IP 54, IP 55 or IP 56 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.

MarelliMotori Cogeneration



MJHR

Model	MJHR
Power	Up to 11.000 kVA
Voltages	Up to 15.000 V
Frame	400 ÷ 1.250
Poles	4, 6, 8 (over contact MM)
Cooling	IC 81W
IP	IP 44. Available up to IP 56.
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled
Main Applications	Steam & GAS Turbines
Sector	Cogeneration

Poles	**4 Poles**	**6 Poles**	**8 Poles**		
| kVA | 60 Hz	10.000	12.500	12.500		

Certificates and testing	
Applicable standards	Generators are designed in compliance with: IEC EN 60034 - 1 BS 4999 - 5000 VDE 0530 NF 51 - 100 NF 51 - 111 OVE M - 10 NEMA MG 1.32 Generators conform to EU rules. UL/CSA certifications available on request. Aderence to ISO 8528 group G preformance classes.
Certificate	Test Certificate supplied with the machine. Material certificates in accordance with EN 10204 : 2001 can be supplied.
Main components	
Housing	Rigid frame, rugged welded steel fabrication (EN 10025 - S235 JR). Frame is provided with side ribs to increase the strength. Marelli Generators for continuous duty operation are designed to meet vibration levels per IEC 60034-14, ISO 10816-1 and BS 5000-3.
Shield	Made of spheroidal graphite cast-iron (EN 1563) or grey cast-iron (EN 1561) up to 630 frame size. Made of structural steel (EN 10025 – S235 JR) above.
Shaft	General data Made in carbon steel and obtained by lamination (EN 10083 – 2 C40 – N). Shaft is obtained by forging from 290 mm diameter and above. The shaft is tested at the manufacturer in order to check it is defect-free. Shaft design Double bearing generator: cylindrical shaft with key.
Main terminal box	Mounted on side (right or left will be selected). Made of formable steels EN 10130.
Fan	Made of aluminum alloy (EN 1706) or structural steel (EN 10025–S235 JR) depending on application requirements.

Heat Exchanger	Construction Mounted on top of alternator. Double tube made of CuNi 90/10. Copper fins housing. Equipped with water leakage detector. Exchanger data Designed pressure 6 bar Test pressure 10 bar Power: up to 200 kW Water flow: up to 18 m3/h Max glycol: 30% Type of water: fresh water or marine (salt) water Flanges: PN6 – PN10 – Special (ANSI) Position can be adjusted to site conditions.
Construction	
Enclosure	TEWAC - Totally Enclosed Water to Air Cooled
Cooling System	IC81W as per IEC60034-6. Primary fluid (water) is flowing by external water system. Internal air is flowing by a fan mounted on the shaft of the generator at the driven side.
Degree of protection	IP 44 as per IEC60034-5. (Available up to IP 56)
Mounting	Horizontal - IM 1001 or IM 1101 as per IEC 60034-7. Other mounting available on request.
Technical data	
Stator/Rotor core	Laminated and enamel-insulated on both sides to minimise eddy-current losses
Rotor	Salient pole type. Made by copper flat wire. H class insulated with enamel coating. Winding retaining by pass-through bars of high quality steel. Rotating rectifier: Graetz diode bridge with 6 diodes. Rotors are dynamically balanced with a half key applied to the shaft extension in accordance with IEC 60034-14 to vibration grade normal A. Special vibration level construction are available.

Bearing	General data Single or double antifriction bearing grease lubricated (ball or roller type) or oil lubricated sleeve bearing. The theoretical lifetime of bearings, L10h according to ISO 281/1 standard, of standard horizontal construction generators, without external forces (radial and / or axial) is in excess of 50.000 hours. On request, the lifetime of bearings, L10h can be in excess of 100.000 hours. Locating bearings are on the D end side and floating bearings on the ND end side. Bearing selection Antifriction bearings up to 800 frame size included. Sleeve bearings from 900 frame size included (available for smaller frame sizes) Regreasing system: Up to 400 frame size: D-end bearing is fitted with inner bearing cap and with grease nipple ND-end bearing is prelubricated with inner bearing cap and without grease nipple 450 frame size and above: both bearings are fitted with grease nipple. Bearing insulation ND end bearing can be insulated to prevent any harmful circulating current from passing through the bearing surfaces. Insulated antifriction bearings in standard configuration: 4, 6 poles: insulated ND end bearing from 630 frame size 8 poles: insulated bearing from 400 frame size All ND end sleeve bearings are insulated as standard.
Impregnation system	Stator and rotor are VPI treated with an unsaturated polyester amide resin which is polymerised in an oven.
Insulation system	Stator: F class insulated with a synthetic enamel (class H option with BH technology). Rotor: H class insulated with a synthetic enamel.
Protective treatments	Epoxivinilic and polyacrylic. Total minimum thickness 120 micromillimeters. Epoxivinilic: Epoxy two component products, with vinyl change. Polyacrylic: Two components polyurethane product formulated with unmodified hydroxyl acrylic resin.

Operating conditions	
Overloads	During continuous duty (S1), the following overloads are allowed: 10% for 1 hour 15% for 10 minutes 30% for 4 minutes 50% for 2 minutes These overloads must be occasional and followed by one hour of running at normal load or less.
Parallel operations	All generators are provided with a amply sized damper cage and are suitable for parallel operations with other generators, when equipped with the paralleling unit. A power factor regulator (to work in parallel with the main) is available on request.
Transient ratings	All generators can be designed to meet specific reactance values (x'd and x''d). Values can be confirmed by contacting Marelli Motori.
Three pahse short circuit current	All generators equipped with overboosting device ensure a three phase short circuit current (Icc) higher than 3 times the rated current (In): Icc > 300% In
Radio interference	All generators are equipped with Class B Group 1 radio interference filters as defined by EN 55011.
THD (Total Harmonic Distortion)	The no-load voltage wave form is sinusoidal with THD content less than 2%.
Vibrations	Vibration level is in accordance with ISO 10816. Measurement, evaluation and limits of vibration severity are in accordance with IEC 60034-14.

Auxiliary device

AVR

Automatic voltage regulator mounted on board.

Size	Type
400 - 450	MEC 20 analog/ digital
500 - 560	M40FA610A analog
630 - 710	M63FA310A analog
800 - 1.250	MEC 100 digital

Digital AVR available for all sizes on request.

Overboosting device

	Size	Type
Medium Voltage	All	CT + Overboosting device
High voltage	All	PMG

Space heaters

Size	Power(W)
400 - 560	400
630 - 710	600
800 - 900	800
1.000	1.000
1.120	1.200
1.250	1.400

Heaters installed at ND-end side.

RTD-PT100

RTD devices in standard configuration:
1+1 RTD on each phase of stator winding
1 RTD on each bearing
Terminals in auxiliary terminal box.
Other configurations available:
DUPLEX type
RTD for inlet / outlet air
RTD for inlet / outlet water

Optional features	
List	Low losses magnetic steel reinforced construction for high linear vibrations flanged shaft for direct coupling with engine flywheel (in case of single bearing solution) neutral point terminals in separate terminal box terminal box inside air duct (internal terminal box) cooling system IC 86W with additional forced ventilation cooler mounted on side increase protection degree up to IP 54, IP 55 or IP 56 lifted feet to couple the generator with engine on existing baseframe redundant rotating rectifier with 12 diodes insulated bearing and earthing brush AVR supplied loose automatic power factor control (analog type) digital AVR MEC100 for frame 400 – 710 (supplied loose) digital AVR MEC100D with diode failure monitoring redundant AVR system excitation/overboosting PMG mounted on generator lubrication system for sleeve bearing other options available on request.

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