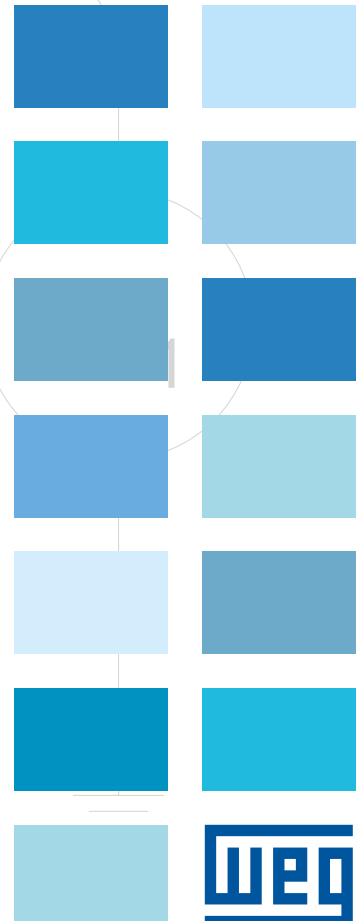


GH20 Hydro Line

Hydrogenerators





HYDROGENERATORS

GH20 Hydro Line

WEG has developed the GH20 Hydro line with a compact design in order to meet the requirements of Mini Hydro and Small Hydro Power Plants.

The GH20 Hydro line is suitable for the characteristics of all types of installation, thus extending the possibilities and adding significant versatility.

Technical Features

- Output: 300 kVA to 3,900 kVA
- Voltage: 380 V to 4,160 V
- Frequency: 50 Hz and 60 Hz
- Protection degree: IP20 and IP21
- Number of poles: 6 to 16
- Mounting type: horizontal
- Excitation brushless



Benefits



Compact



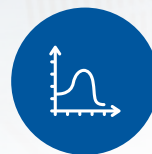
Low and
medium
voltage



Grease or oil
lubricated
antifriction
bearing



VPI impregnation
with Epoxy resin



Designed according to
turbine runaway speed



Reduced
maintenance

Construction Features

Frame

The GH20 Hydro frame has a smooth design, as it is made of a single rolled-steel plate that has cutouts for air inlet/outlet and for mounting the main and accessory terminal boxes. This design ensures higher quality and faster manufacturing process.



Bearings

The GH20 Hydro bearings have been developed for easy maintenance and high reliability of operation. The design of the bearings can withstand both radial and axial loads from the hydraulic turbine and flywheel. Therefore, it does not require the use of multiple bearings to support the loads from the turbine and flywheel. This bearing design reduces the length of the generator turbine assembly. Lubrication can be done with grease or oil, depending on the bearings chosen. The bearings are extremely robust against lubrication failures, thus avoiding the need for complex monitoring systems.

Terminal Box

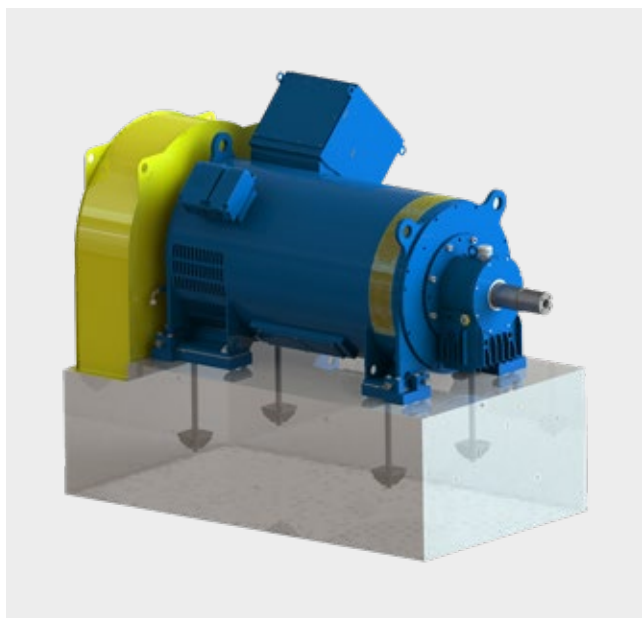
The main terminal box of the GH20 Hydro line was developed to meet the low and medium voltage segment. It has 6 terminals with access to the neutral leads.

Cylindrical Shaft

The GH20 Hydro line has cylindrical shafts, i.e. rib-free, with shaft ends according to the IEC/NEMA standard. Shafts are made of SAE 4140 alloy steel, which has mechanical properties appropriate to the application. Shafts are also designed to meet the internal criteria for fatigue, stress concentrators, compressive strength, torsional resistance, flexural strength and tensile strength, as well as static deformation and torsional stiffness.

Integrated Inertia Flywheel

When necessary, the flywheel is integrated directly into the generator shaft. The generator bearings are sized to support the flywheel, reducing the size of the generating unit and maintenance costs.



Instrumentation

The GH20 Hydro line is supplied with protection devices such as: thermal sensors, voltage and current measurement devices and speed sensors.

The sensors are used to improve and monitor the operation of the generator, bringing greater reliability to its operation.



Manufacturing Processes

Insulation System

WEG uses the WEG MICATHERM insulation system. This system is based on the Vacuum Pressure Impregnation (VPI) process, developed in conjunction with the world's most renowned insulation material suppliers. The VPI process has shown its efficiency and reliability in rotating electric machines in a variety of applications for many years. Using special epoxy resins, this system ensures the complete insulation of the coils; our resin curing process does not release harmful gases to the atmosphere.

Tests

The WEG hydrogenerators are tested according to IEC and NEMA standards in a specially designed modern laboratory equipped to test hydrogenerators with power up to 20,000 kVA and voltages up to 15,000 V. In addition to the tests carried out at the plant, WEG also has a large team of field technicians trained to perform assembly, commissioning, and start-up of the hydrogenerators at the installation site.

Winding

WEG's winding process is specially designed and specified for the required generation voltage. The medium voltage hydrogenerators coils are manufactured with rectangular copper wire, pre-formed and insulated with mica-based porous tape. In addition, conducting and semi-conducting strips are used in the winding process, wrapping the coils and ensuring their resistivity.



Laser Cutting Machine



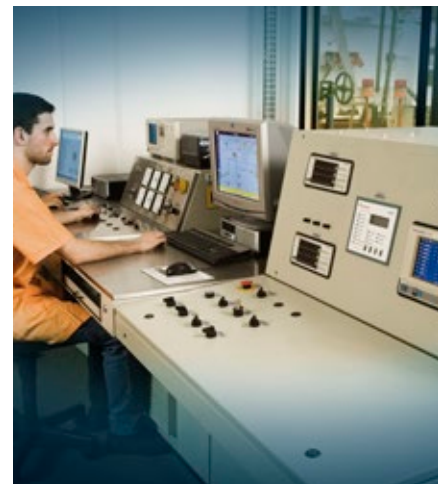
Reaming



Vertical Lathe



VPI Impregnation System



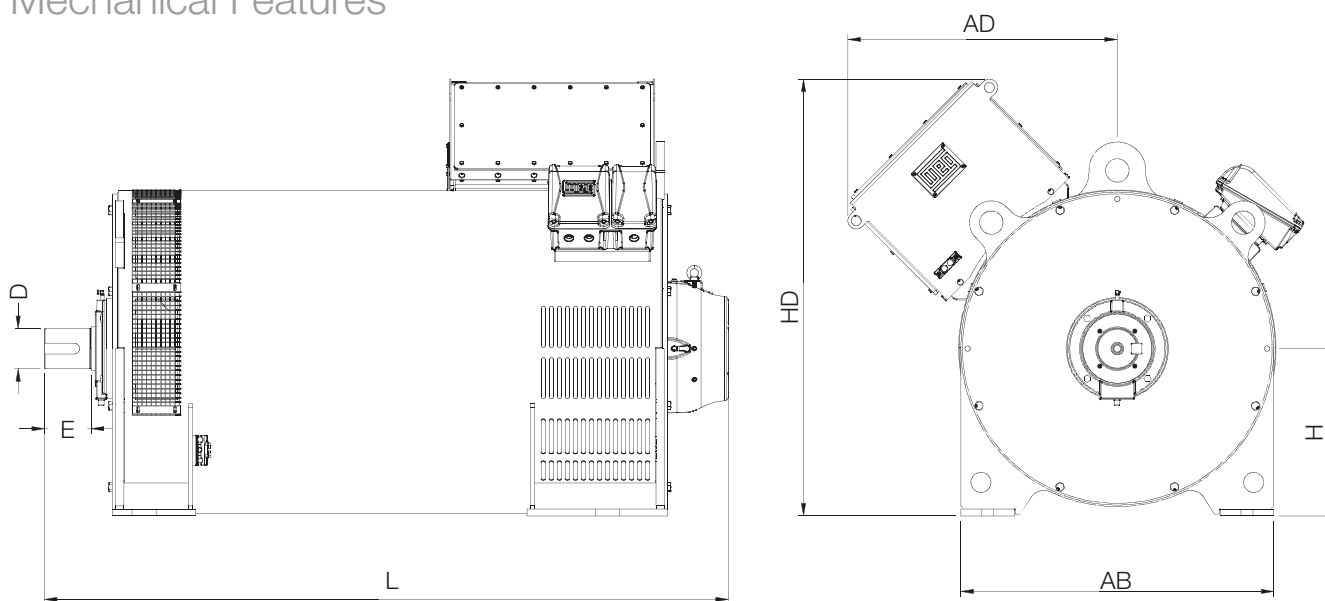
Tests Laboratory

Output (kVA)

480 V - 60 Hz - Elevation H						
Poles / Speed	Frame					
	315	355	400	450	500	560
6 / 1,200 rpm	525	850	1,350	2,000	2,900	3,900
8 / 900 rpm	-	600	900	1,350	2,000	2,900
10 / 720 rpm		-	625	875	1,375	2,150
12 / 600 rpm			-	640	1,100	1,750
14 / 514 rpm				500	825	1,320
16 / 450 rpm				-	575	1,100

4.160 V - 60 Hz - Elevation F						
Poles / Speed	Frame					
	315	355	400	450	500	560
6 / 1,200 rpm	400	655	1,000	1,750	2,700	3,150
8 / 900 rpm	-	450	680	990	1,650	2,550
10 / 720 rpm		-	475	775	1,075	1,800
12 / 600 rpm			-	540	850	1,350
14 / 514 rpm				450	640	1,050
16 / 450 rpm				-	430	900

Mechanical Features



Dimensions (mm)							
Frame	D	E	H	L ¹⁾	AB	AD	HD
315	75	110	355	1,680	690	720	1,080
355	85	120	400	1,780	775	750	1,150
400	100	130	450	1,890	875	790	1,240
450	120	140	500	2,050	935	810	1,310
500	130	160	560	2,220	1,050	840	1,400
560	140	170	630	2,210	1,150	880	1,480

Note: 1) Dimension may vary with generator power.



WEG Worldwide Operations

ARGENTINA

San Francisco - Cordoba
Phone: +54 3564 421484
info-ar@weg.net

Cordoba - Cordoba
Phone: +54 3514 641366
weg-morbe@weg.com.ar

Buenos Aires
Phone: +54 1142 998000
ventas@pulverlux.com.ar

AUSTRALIA

Scoresby - Victoria
Phone: +61 3 97654600
info-au@weg.net

AUSTRIA

Markt Piesting - Wiener
Neustadt-Land
Phone: +43 2 633 4040
watt@wattdrive.com

Vienna
Phone: +43 1 796 2048
wtr@weg.net

BELGIUM

Nivelles - Belgium
Phone: +32 67 888420
info-be@weg.net

BRAZIL

Jaraguá do Sul - Santa Catarina
Phone: +55 47 32764000
info-br@weg.net

CHILE

La Reina - Santiago
Phone: +56 2 27848900
info-cl@weg.net

CHINA

Nantong - Jiangsu
Phone: +86 513 85989333
info-cn@weg.net

Changzhou - Jiangsu
Phone: +86 519 88067692
info-cn@weg.net

Rugao - Jiangsu
Phone: +86 513 80672011
zhuhua@weg.net

COLOMBIA

San Cayetano - Bogota
Phone: +57 1 4160166
info-co@weg.net

Sabaneta - Antioquia
Phone: +57 4 4449277
info-co@weg.net

ECUADOR

Pradera - Quito
Phone: +593 2 3 922 129
wegecuador@weg.net

FRANCE

Saint-Quentin-Fallavier - Isère
Phone: +33 4 74991135
info-fr@weg.net

GERMANY

Türnich - Kerpen
Phone: +49 2237 92910
info-de@weg.net

Balingen - Baden-Württemberg
Phone: +49 7433 90410
info@weg-antriebe.de

Nuremberg
Phone: +49 911 239568 -700
info@tgmkanis.com

Homburg (Efze) - Hesse
Phone: +49 5681 99520
info@akh-antriebstechnik.de

GHANA

Accra
Phone: +233 30 2766490
ghana@zestweg.com

INDIA

Bangalore - Karnataka
Phone: +91 080 46437450
info-in@weg.net

Hosur - Tamil Nadu
Phone: +91 4344 301577
info-in@weg.net

ITALY

Cinisello Balsamo - Milano
Phone: +39 2 61293535
info-it@weg.net

JAPAN

Yokohama - Kanagawa
Phone: +81 45 5503030
info-jp@weg.net

MALAYSIA

Shah Alam - Selangor
Phone: +60 3 78591626
info@wattdrive.com.my

MEXICO

Huehuetoca - Mexico
Phone: +52 55 53214275
info-mx@weg.net

Tizayuca - Hidalgo
Phone: +52 77 97963790
info-mx@weg.net

NETHERLANDS

Oldenzaal - Overijssel
Phone: +31 541 571080
info-nl@weg.net

PERU

La Victoria - Lima
Phone: +51 1 2097600
info-pe@weg.net

PORTUGAL

Maia - Porto
Phone: +351 22 9477700
info-pt@weg.net

RUSSIA and CIS

Saint Petersburg
Phone: +7 812 363 2172
sales-wes@weg.net

SOUTH AFRICA

Johannesburg
Phone: +27 (0) 11 7236000
info@zestweg.com

Cape Town
Phone: +27 (0) 21 507 7200
gentsets@zestweg.com

Heidelberg
Phone: +27 (0) 16 349 2683/4/5
wta@zestweg.com

SPAIN

Coslada - Madrid
Phone: +34 91 6553008
info-es@weg.net

Valencia
Phone: +34 96 1379296
info@autrial.es

SINGAPORE

Singapore
Phone: +65 68589081
info-sg@weg.net

Singapore
Phone: +65 68622220
info-sg@weg.net

SCANDINAVIA

Mölnlycke - Sweden
Phone: +46 31 888000
info-se@weg.net

UK

Redditch - Worcestershire
Phone: +44 1527 513800
info-uk@weg.net

UNITED ARAB EMIRATES

Jebel Ali - Dubai
Phone: +971 4 8130800
info-ae@weg.net

USA

Duluth - Georgia
Phone: +1 678 2492000
info-us@weg.net

Bluffton - Indiana
Phone: +1 800 5798527
info-us@weg.net

Minneapolis - Minnesota
Phone: +1 612 3788000
info-us@weg.net

Washington - Missouri
Phone: +1 636-239-9300
wegwill@weg.net

VENEZUELA

Valencia - Carabobo
Phone: +58 241 8210582
info-ve@weg.net

For those countries where there is not a WEG own operation, find our local distributor at www.weg.net.



WEG Group - Energy Business Unit
Jaraguá do Sul - SC - Brazil
Phone: +55 47 3276 4000
energia@weg.net
www.weg.net

