MOTEURS Baudouin

DCP 1750kVA/1400kW

@230/400V 50Hz

WPG1900*7

DIESEL GENERATOR SET

50 Hz – Non Emission

GENERATING SET RATINGS
50Hz – 1500rpm @ 0.8p.f

NET	DCP		PRP		ESP	
Voltage	**kVA**	kWe	**kVA**	kWe	**kVA**	kWe
415/240	**1750**	1400	**1750**	1400	**1900**	1520
400/230	**1750**	1400	**1750**	1400	**1900**	1520
380/220	**1750**	1400	**1750**	1400	**1900**	1520

PRODUCT STANDARD FEATURES

Engine and Block
- Cast iron cylinder block with inspection door per cylinder
- Cast iron cylinder liners, wet type and replaceable valves guides and seats
- Separate cast iron cylinder heads with 4 valves
- Hardened steel forged crankshaft with induction hardened journals, crankpins and radius

Cooling System
- Two separate circuits
- High temperature circuit equipped with thermostatically-controlled system with two gear driven coolant pumps
- Low temperature circuit equipped with belt driven coolant pump

Fuel System
- Super-high pressure common-rail fuel system for more peak fire pressure
- Pre-filter and main filters with electric fuel pump

Lubrication System
- Full flow screw able oil filters
- Lube oil purifier with replaceable cartridge
- Water cooled lube oil cooler

Electrical System
- Standard starting system comes with 2 x 24 Vdc electric starter motors and 1 x battery charging alternator
- Redundant dual starting system available as an option.

Air Intake and Exhaust System
- 4 single-stage turbochargers
- Silencer available as an option
- Exhaust manifold and turbocharger shield for heat isolating

Alternator
- High Effieciency Brushless, 4 Pole, IP23 drip-proof revolving field design built with Class H insulation/Class F Temperature rise
- Low reactance with 2/3 pitch windings on the stator
- Direct-coupled by high-elasticated coupling
- Sustained overcurrent >300% in 10 sec
- Direct drive centrifugal blower fan cooling
- Excitation by PMG

Genset Controller
- Baudouin's Genset controller is ideal for a wide range of applications
- Display status message Provide protection Auto shutdown at fault detection
- See individual spec sheet for detailed specifications

1) All ratings are based on operating conditions under ISO 8528-1, ISO 3046, DIN6271. Performance tolerance of ±5%.
2) Test conditions: 100 kPa, 25°C air inlet temperature, relative humidity of 30%, with fuel density 0.84 kg/L. Derating may be required for conditions outside these; please contact the factory for details.
3) Power output curves are based on the engine operating with a fuel system, water pump, and lubricating oil pump; not included are the battery charging alternator, fan, and optional equipment.

GENERATOR SET SPECIFICATIONS		
Governor and regulation class		In accordance with ISO 8528-5 Class G3 performance
Phase number and connection		3 phase, 4 wires, Y-type
Cooling method		Closed looped water-cooled
Starting method		DC 24V Electric starter
Steady-state voltage deviation		≤± 1%
Steady-state frequency band		≤ 0.5%

ENGINE		
Brand / Model		Baudouin / 16M33G1900/5
Gross Power	kWm	ESP1680 – / PRP - 1530
Cylinder / Type / Aspiration		16 / Vee Type, Turbocharged and intercooled
Bore x Stroke	mm	150 x 185
Displacement	L	52.3
Compression ratio		15:1
Brake Mean Effective Pressure	kPa	ESP – 2570
** See engine data sheet for detailed specification		

ALTERNATOR	
Coupling / No. of Bearing	Direct / Single
Winding Pitch	2/3
Type of Excitation	PMG
Cooling type	Air
Voltage regulation method	AVR
Winding temperature sensor	PT100
Bearing temperature sensor	PT100
Anti-condensation heater voltage	AC230V
Insulation	Class H
Protection Grade	IP23
** See alternator data sheet for detailed specification	

COOLING SYSTEM		
Type of Coolant		Liquid(water + 50% antifreeze)
Max coolant temperature – shutdown	°C	108
Cooling Fan Airflow	m3/min	2130
** See radiator data sheet for detailed specification		

EXHAUST SYSTEM		
Exhaust Gas temperature after the turbocharger	°C	550
Exhaust Gas flow	m3/min	ESP – 385.5 PRP – 347.9
Max Exhaust back pressure	mBar	75

FUEL CONSUMPTION (Tolerance +3%)		
100% ESP	L/hr	407.6
100% PRP	L/hr	364.3
75% PRP	L/hr	265.4
50% PRP	L/hr	179.7
25% PRP	L/hr	99.9

GENSET CONTROLLER

Baudouin's Genset controller is designed for manual/auto parallel systems.
The controller is an easy to use Synchronising Auto Mains (Utility) Failure Control Module suitable for paralleling single gensets (diesel or gas) with the mains (utility).

Key Benefits

- Real-time clock provides accurate event logging
- Ethernet communication, provides built in advanced remote monitoring.
- Can be integrated into building management systems (BMS) and programmable logic control (PLC)

OPTIONS

Engine

□ Coolant heater
□ Fuel / Water separator
□ Remote radiator / heat exchanger
□ Redundant dual starting system
□ Exhaust ~25dBA reduction muffler
□ Exhaust Y-connection pipe
□ Lube oil automatic replenishment system

Alternator

□ Class H or B temperature rise
□ Oversized terminal box
□ Mounting differentiates CT
□ Infrared view port
□ Winding protections for harsh environments and relative humidity greater than 95%

Ratings definitions

Emergency standby power (ESP):

ESP is the maximum power available for a varying load for the duration of a main power network failure. The average load factor over 24 hours of operation should not exceed 70% of the engine's ESP power rating.

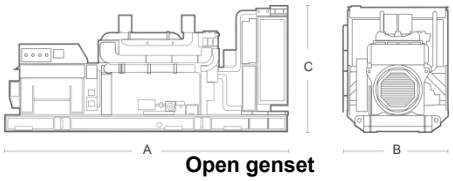
Typical operational hours of the engine are 200 hours per year, with maximum usage of 500 hours per year. This includes an annual maximum of 25 hours per year at the ESP power rating. No overload capability is allowed. The engine is not to be used for sustained utility paralleling applications.

Prime power (PRP):

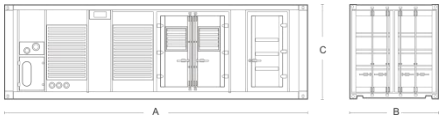
PRP is the maximum power available for unlimited hours of usage in a variable load application. The average load factor should not exceed 70% of the engine's PRP power rating during any 24-hour period. An overload capability of 10% is available for 1 hour within every 12-hour period.

Data Center power (DCP):

DCP is the maximum power that an engine is capable of delivering while supplying a variable or continuous load and during unlimited run hours. An overload capability of 10% is available for 1 hour within every 12-hour period



Open genset



Silence genset

This outline drawing is to provide representative configuration details for Model series only.
See respective model data sheet for specific model outline drawing number.

Do not use for installation design

Dimension and Weight

Structure	Model	Dim "A" mm	Dim "B" mm	Dim "C" mm	Dry wt. kg
Open	WPG1900B7	5780	2200	2800	14450
Silence	WPG1900C7	12192	3000	3300	28900

* Note:Sizes and weights represent a set with standard 400V features. See the outline drawings for the detailed configurations of sizes and weights.

Codes and standards

ISO 9001	This generator set is designed and manufactured in facilities certified to ISO 9001.	ISO 8528	This generator set has been designed to comply with ISO 8528 regulation.
CE	The CE marking is only valid when equipment is used in a fixed installation application. Material compliance declaration is available upon request.	NFPA 110	The genset can comply to a single step in accordance with NFPA 110

The generator set is designed and manufactured in facilities certified to standards ISO9001:2015 and ISO14001:2015. The generator set is prototype-tested, factory-built and production tested and is in compliance with the relevant standards:

- ISO 8528-13, ISO 3046, DIN627
- EN 60034-1, EN 60204-1
- Machinery Directive 2006/42/EC/LVD 2014/35/EU

Data and specifications are subject to change without notice.

Contact information:

Weichai Singapore Pte Ltd
No. 237, Pandan Loop, #05-11
Westech Building,
Singapore 128424
Tel: +65-6779 4869 | +65-6779 2729
Fax: +65-6779 7195

Engine data sheet

Ratings

RPM	Gross Engine Output			Net Engine Output *		
	PRP	DCP	ESP	PRP	DCP	ESP
	kWm	kWm	kWm	kWm	kWm	kWm
1500	1530	1530	1680	1528.5	1528.5	1678.5

1 kWm = 1,34 BHP
* This data is calculated without radiator.

Basic data

Engine model 16M33G1900/5
N° of Cylinders / Valves ..... 16 / 64
Cylinders arrangement ..... At Vee
Bore x Stroke (mm) ..... 150 x 185
Displacement (L) 52.3
Thermodynamic Cycle ..... Diesel 4 stroke
Mean Piston Speed (m/s) 9.25
BMEP @ ESP (Bar) 25.70
Cooling System ..... Liquid (water + 50% antifreeze)
Injection System ..... Direct
Fuel System ..... High Pressure Common Rail
Aspiration ..... Turbocharged and Aftercooled
Compression ratio ..... 15 : 1
Flywheel housing ..... SAE 0
Flywheel ..... 18"
N° of teeth on flywheel ring gear 194
Inertia of flywheel (kg•m²) 7.2
Inertia of crankshaft (kg•m²) 10.1
Emission standard ..... N/A
Overall Dimensions without radiator (Length x Width x Height) (mm) ..... 2586 x 1542 x 1746
Engine dry weight without radiator and without radiator pipes (kg) 5200

Air intake system

Air intake temperature rise (°C) ..... ⩽ 5
Air intake restriction clean filter (mBar) ..... ⩽ 30
Air intake restriction dirty filter (mBar) ..... ⩽ 62
Recommended air flow @ PRP (m³/min) 106
Recommended air flow @ ESP (m³/min) 116.1
Min. diameter of intake pipe (mm) 140

Aftercooling system

Aftercooler system type ..... Air to Water
Max. intake temperature @ 25°C ambient temperature (°C) 55
Max. difference between intake temperature and ambient temperature (°C) 30
Max. intake pressure drop of aftercooler (mBar) 80

Lubrication system

Oil capacity Low / High (L) ..... 114 / 171
Oil pressure in normal condition idle speed (Bar) ..... ⩾ 2
Oil pressure in normal condition at 1500 Rpm @ PRP (Bar) ..... 4 - 6.5
Lowest oil pressure alarm (shutdown) (Bar) 2
Max. oil temperature (°C) 105
Oil flow at 1500 Rpm (L/min) ..... ⩾ 533
Oil fuel consumption ratio based on engine fuel consumption data ..... ⩽ 0.3 %
Total system capacity (including filters) (L) 175

Heat balance test data (with ambient temperature 28.9 °C)

Total heat dissipation @ ESP (kJ/s) 2443.9
- Heat Rejection to HT Circuit @ ESP (kJ/s) 629.7
- Heat Rejection to LT Circuit @ ESP (kJ/s) 348.8
- Radiated Heat to Ambient @ ESP (kJ/s) 201
- Heat Rejected to Exhaust @ ESP (kJ/s) 1264.4

Exhaust system

Max. exhaust back pressure (mBar) 75
Max. exhaust temperature before turbocharger (°C) 750
Max. exhaust temperature after turbocharger (°C) 550
Exhaust flow @ PRP (m³/min) 347.9
Exhaust flow @ ESP (m³/min) 385.5
Min. diameter of exhaust pipe (mm) 194
Max. bending moment of exhaust gas exit flange (Nm) 10

Cooling system

Min. inside diameter of coolant outlet pipe LT/HT(mm) 58/79
Coolant alarm (shutdown) temperature (°C) 108
Thermostat opening temperature / full open temperature (°C) ..... 80 / 92
Coolant capacity of the engine (L) 130
Max. additional restriction for external cooling circuit (Bar) 0.38
Max additional restriction - Duct allowance (Pa) 150

Fuel system

Governor ..... ECU
Governor steady state speed stability at constant load (ISO 8528-5 Class G3) [1] ..... ≤ +/- 0.5 %
Max. restriction at fuel inlet (Bar) 0.5
Max. pressure at fuel inlet (Bar) 0.5
Max. fuel return restriction (Bar) 0.2
Max. fuel inlet temperature (°C) 70
Fuel supply flow (L/hr) 1900
Min. internal diameter of inlet pipe (mm) 19
Min. internal diameter of return pipe (mm) 19

Electrical system

Electrical system voltage (negative to ground) (Vdc) 24
Starter power (kW) ..... 2 x 8.5
Battery charger current (A) 55
Battery charger absorbed power (kW) 1.54
Battery discharge current requirement at -18℃ (CCA) ..... 1500 - 2400
Max. electric resistance of starting circuit (Ω) 0.008
Min. sectional area of wire (mm²) 95
Min. ambient cold start temperature without auxiliary starting device (°C) [2] ..... - 10
Min. ambient cold start temperature with auxiliary starting device (°C) [2] ..... - 25

[1] This refers only to the frequency response of the engine and should not be confused with the performance class of the Generator Set, which is subject to additional contributing factors such as alternator selection and control settings.

[2] Engines used in emergency standby application or applications that require immediate start under load, they must be equipped with coolant heaters. Baudouin recommend heaters installation to be executed by providing constant coolant circulation across all the engine components. Two heaters are required for V-type engines, one per each side.

Noise

Diesel engine noise (Acoustic power level) (dB(A)) 119.2
Noise - upper side (dB(A)) 101.8
Noise - right side (view from flywheel) (dB(A)) 100.1
Noise - left side (view from flywheel) (dB(A)) 103.1
Noise – front (radiator) side (dB(A)) 101.8
Noise – rear (flywheel) side (dB(A)) 101.4

Notes :

a) Noise test made at 100% of the ESP power, at 1 mt. distance, on engine without radiator, without cooling fan and without silencer.
b) Noise test refers to GB/T 1859 norm : "Reciprocating internal combustion engines. Measurement of emitted airborne noise. Engineering method and survey method".

Fuel consumption

Rating	gr/kWh	L/hr
100% ESP	203.8	407.6
100% PRP	200	364.3
75% PRP	194.3	265.4
50% PRP	197.3	179.7
25% PRP	219.3	99.9
	Fuel consumption tolerance + 3 %	

Ratings definitions

Emergency Standby Power (ESP)
Emergency Standby Power is the maximum power available for a varying load for the duration of a main power network failure. The average load factor over 24 hours of operation should not exceed 70% of the engine's ESP power rating. Typical operational hours of the engine is 200 hours per year, with a maximum usage of 500 hours per year. This includes an annual maximum of 25 hours per year at the ESP power rating. No overload capability is allowed. The engine is not to be used for sustained utility paralleling applications.

Prime Power (PRP)
Prime Power is the maximum power available for unlimited hours of usage in a variable load application. The average load factor should not exceed 70% of the engine's PRP power rating during any 24 hour period. An overload capability of 10% is available, however, this is limited to 1 hour within every 12 hour period.

Data Centre Power (DCP)
Data Centre Power is defined as being the maximum power which a generating set is capable of delivering while supplying a variable or continuous electrical load and during unlimited run hours. Depending on the sites to supply and the availability of reliable utility, the generating set manufacturer is responsible to define what power level he is able to supply to fulfil that requirement including hardware or software or maintenance plan adaptation.
Note : The engine driven alternating current generating set is a reliable source of power for the data centre and it can be also used to back up a reliable utility. Prolonged operation at load in parallel with a utility is not permitted.

1) All ratings are based on operating conditions under ISO 8528-1, ISO 3046, DIN6271. Performance tolerance of ±5%.
2) Test conditions : 100 kPa, 25°C air inlet temperature, relative humidity of 30%, with fuel density 0.84 kg/L. Derating may be required for conditions outside these; please contact the factory for details.
3) Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan and optional equipment.

18-10/2023/V1

MOTEURS Baudouin

WPG1900B7

Radiator Technical Data Sheet

Radiator Technical Data Sheet

Application: Radiators

Engine Data: 16M33G1900/5

Application Data:

	Hot water radiator	Low temperature intercooler
Required Ambient Temp, ℃	55	
Cooling Air Inlet Temp, ℃	65.2	55.00
Cooling Air Outlet Temp, ℃	80.4	65.2
Heat Rejection, Kj/S	630	349
Overload, %	10%	10%
Flow Rate, L/min	1650	680
Coolant Inlet Temp, ℃	100	80
Coolant Outlet Temp, ℃	93.7	71.6
Fluid	50/50	50/50
Cooler Data		
Radiator Model	1002915420	
Radiator Size, WxHxT,mm	W2200×H2470×T1150	
Radiator dry weight, kg	1248	
Radiator water capacity, L	412.14	
Core Type/Construction	CU	AL
Passes	1	1
Air Flow Required, m^3/min	2130	
Air-Side Press Drop, Pa	470	420
Water-Side Pressure Drop, kPa	12	4.5
Fan&Motor Data		
Fan Diameter, mm	1980	
Fan noise, dBA &1m	105	
Fan speed, RPM	1056	
Fan Absorb Power, Kw	75.8	
Number of blades	10	

Structure Parameters of water High Parameters Radiator			Structure Parameters of water Low Parameters Radiator		
Core	Width(mm)	2039	Core	Width(mm)	2030
	Height(mm)	2112		Height(mm)	2112
	Thickness(mm)	78		Thickness(mm)	92
	Frontal Area(m^2)	4.3		Frontal Area(m^2)	4.28
	Cooling Area(m^2)	396.8		Cooling Area(m^2)	270
Cooling Tube	Shape(mm)	16x1.8	Cooling Tube	Shape(mm)	14x2.5
	Wall thickness(mm)	0.12		Wall thickness(mm)	0.12
	Number	824		Number	774
	Perimetar(mm)	34.1		Perimetar(mm)	30.75
	Cooling Area(m^2)	73.5		Cooling Area(m^2)	50.2
	Material	GH65FY2-t0.12(GB/T11087)		Material	GH65FY2-t0.12(GB/T11087)
Fins	Wave Height(mm)	8	Fins	Wave Height(mm)	——
	Wave Distance(mm)	3.2		Wave Distance(mm)	3.0
	Number	208		Number	680
	Thickness(mm)	0.04		Thickness(mm)	0.06
	Material	T3-t0.04(GB/T2059)		Material	H65Y-t0.06(GB/T2059)
	Cooling Area(m^2)	323.3		Cooling Area(m^2)	219.8
	Fin Type	window		Fin Type	window

Coolant inlet temperature during test			80℃	Ambient temperature during test				30℃
Water flow	Wind speed	Standard heat dissipation	Water resistance	Wind resistance	Coolant inlet temperature	Coolant outlet temperature	Cooling air inlet temperature	Cooling air outlet temperature
L/min	m/s	kw	kPa	Pa	℃	℃	℃	℃
900	6	801.9	4.0	290	80	64.7	30	51.5
	7	844.0	4.0	309	80	63.9	30	49.4
	8	866.6	4.0	326	80	63.5	30	47.5
	9	880.0	4.0	358	80	63.2	30	45.8
1000	6	853.1	4.9	290	80	65.4	30	52.9
	7	897.8	4.9	309	80	64.6	30	50.7
	8	921.9	4.9	326	80	64.2	30	48.6
	9	936.2	4.9	358	80	64.0	30	46.8
1100	6	904.3	5.7	290	80	65.9	30	54.3
	7	951.7	5.7	309	80	65.2	30	51.9
	8	977.2	5.7	326	80	64.8	30	49.7
	9	992.4	5.7	358	80	64.5	30	47.8

Alternator data sheet

ALTERNATOR TECHNICAL DESCRIPTION
WHA 52.3 L9

Date: 23-11-2023

197 A,Fushou East Street,High-Tech Development Zone, Weifang,China

Main data					C
Generator type:	**WHA 52.3 L9**				
Power:	1 750	kVA	1 400 kWe	1 450 kWm	
Voltage:	400	V	Star serial		
Rated voltage range:	+5/-5%				
Power factor - Lagging:	0,8				
Frequency:	50	Hz			
Speed:	1 500	rpm			
Nominal current:	2 526	A			
Winding type:	p2/3				
Classes (Insulation / Temperature Rise):	H / F				
Ambient temperature:	45	°C			
Altitude:	1 000	m			

Installation	IEC	Quantity	1
Prime mover:	Reciprocating engine		
Manufacturer:	-		
Type:	-		
Duty:	Base Rating		

Mechanical construction	IM1001
Type of construction:	Two bearing
Mounting arrangement:	Horizontal Axis
Direction of rotation:	Clockwise (seen when facing the drive end - DE)
Bearing type:	Anti-friction
Bearing Lubrication:	Regreasable
Bearing insulation:	Not insulated
Shaft end type:	Cylindrical with keyway
Balancing - Class (ISO 21940-11):	Half key - G2,5 (std)
Flange:	None / without
Shaft height:	500 mm
Width:	750 mm

Additional specificities		
Stabilized Runaway speed:	1 800	rpm - 2 min.

Cooling Method	IC01
Degree of protection:	IP23
Coolant:	Air / Temperature: 45 °C
Air quality:	Clean
Ventilation (internal):	Self-ventilated
Filters:	Without
Ducting for air inlet:	No
Ducting for air outlet:	No

ALTERNATOR TECHNICAL DESCRIPTION
WHA 52.3 L9

Date: 23-11-2023

Connection, Excitation & Regulation

Parallel operation:	Island mode (0F) - no droop CT
Excitation:	Self-excited - Brushless - Type: AREP + PMI
Sustained 3-phase Isc:	> 3 x FLC for 10s.
AVR type:	D550 - Digital
AVR location:	In terminal box
Alternator Voltage sensing:	In terminal box

Terminal box

Power connection:	4 connectors (brought out neutral)
Main terminal box location:	1 terminal box on the top
Line side outlet:	Left hand side (seen when facing the drive end - D)
Gland plate:	Non magnetic, Undrilled
Auxiliaries	In main terminal box
	-

Protection and measurement accessories

Temperature detection

Stator windings:	6 x PT100 RTDs (3 wires)
Combined guide and thrust bearing - DE:	1 x PT100 RTD (3 wires)
Guide bearing - NDE:	1 x PT100 RTD (3 wires)

Anti-condensation heating

Voltage: 230 V - 1Ph / Power: 500 W

Various items

Paint:	PE - Primary - RAL 7032
Documentation:	PDF manual
Documentation Language:	English

Controls

QUAL/INES/006 001 => 101	Measurement of winding resistance
QUAL/INES/006 021 => 128	Insulation check on sensors (when fitted)
QUAL/INES/006 002 => 102&103	Voltage balance and phase order check
QUAL/INES/006 007 => 109	Overspeed test (according to test bench limitation)
QUAL/INES/006 009 => 111	High potential test
QUAL/INES/006 010 => 112	Insulation resistance measurement

MOTEURS Baudouin

ALTERNATOR ELECTRICAL DATA
WHA 52.3 L9

Date: 23-11-2023

Main data: C

Power:	**1 750**	kVA	**1 400**	kWe	**1 450**	kWm
Voltage:	**400**	V	Frequency:		**50**	Hz
Rated voltage range:	+5% / -5%		Speed:		1500	rpm
Power factor - Lagging:	0,8					
Nominal current:	2 526	A	Phases		3	
Insulation / Temperature rise:	H / F		Connexion		Star serial	
Cooling:	**IC01**		Winding type:		p2/3	
			Winding:		- 6 Wires	
Ambient temperature:	45	°C				
Altitude:	1000	m	Overspeed (rpm)		1800	
Duty: Base Rating			Total Harmonic Distortion (THD) < 3,5%			

Efficiency (Base 1400 kWe) IEC

	25%	50%	75%	**100%**	110%
Power factor - Lagging: 0,8	94,15	96,26	96,60	**96,53**	96,45
Power factor - Lagging: 1	94,69	96,92	97,40	**97,48**	97,46

Reactances (%) - (Base 1750 kVA)

Unitary impedance (1 per unit) = 0,091429 ohms

		Direct axis *Unsaturated*	Direct axis *Saturated*		Quadrature axis *Unsaturated*	Quadrature axis *Saturated*
Synchronous reactance	Xd	255	190	Xq	130	97
Transient reactance	X'd	22,8	19,4	X'q	130	97
Subtransient reactance	X"d	11,5	9,8	X"q	11,9	10,1
Negative sequence reactance	X2	11,7	10,0			

X0	1,9	Zero sequence reactance
Xl	5,7	Stator leakage reactance
Xr	18,3	Rotor leakage reactance
Kc	**0,53**	Short-circuit ratio

Time constants (s)

	Direct axis		Quadrature axis	
Open circuit transient time constant	T'do	2,99	T'qo	NA
Short-circuit transient time constant	T'd	0,267	T'q	NA
Open circuit subtransient time constant	T"do	0,044	T"qo	0,216
Subtransient time constant	T"d	0,022	T"q	0,020

Ta	0,028	Armature winding short circuit time constant

Resistances (%)

Ra	1,3	Armature resistance	R0	0,6	Zero sequence resistance
X/R	7,3	X/R ratio (without unit)	R2	2,3	Negative sequence resistance

Voltage accuracy: 0,25%
Maximum inrush current for a voltage dip of 15%: 1507 kVA
when starting an AC motor having a starting power factor between 0 and 0.4

Rating is provided for the specified temperature rise, by resistance measurement according to IEC60034-1

According to: I.E.C. 60034.1 - 60034.2 - NEMA MG 1-32

MOTEURS Baudouin

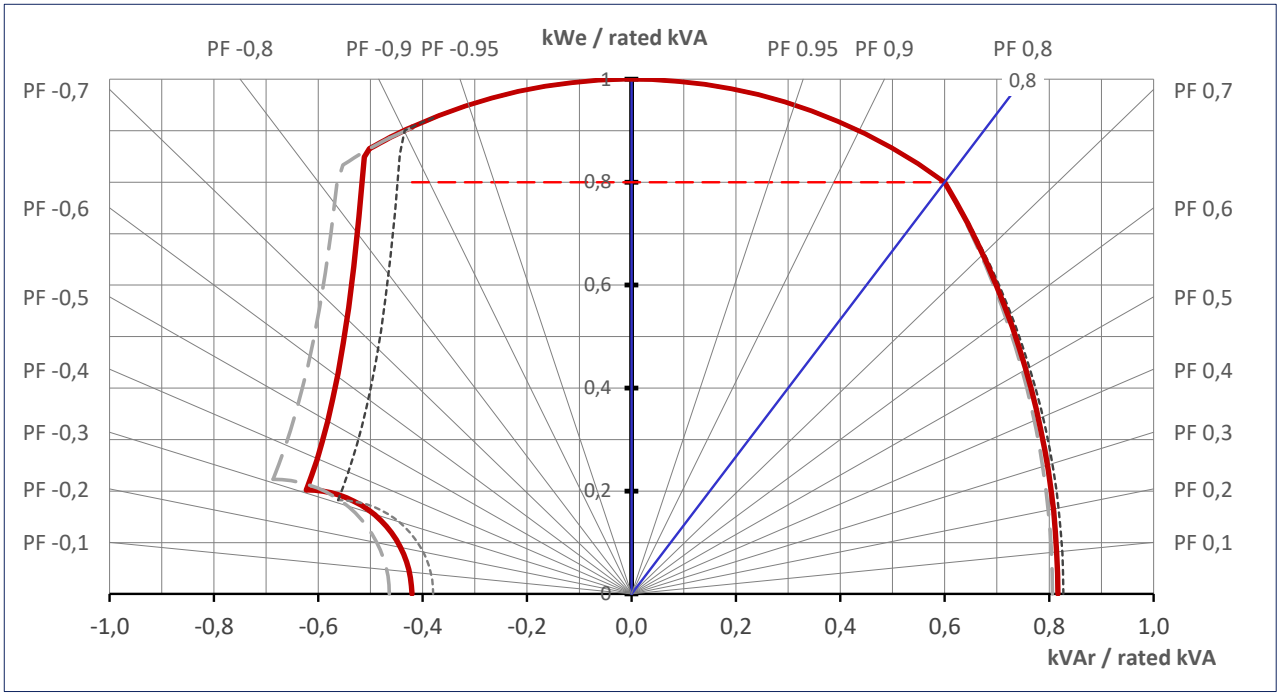
ALTERNATOR MAIN CURVES
WHA 52.3 L9

Date: 23-11-2023

1750kVA - 400V - 50 Hz

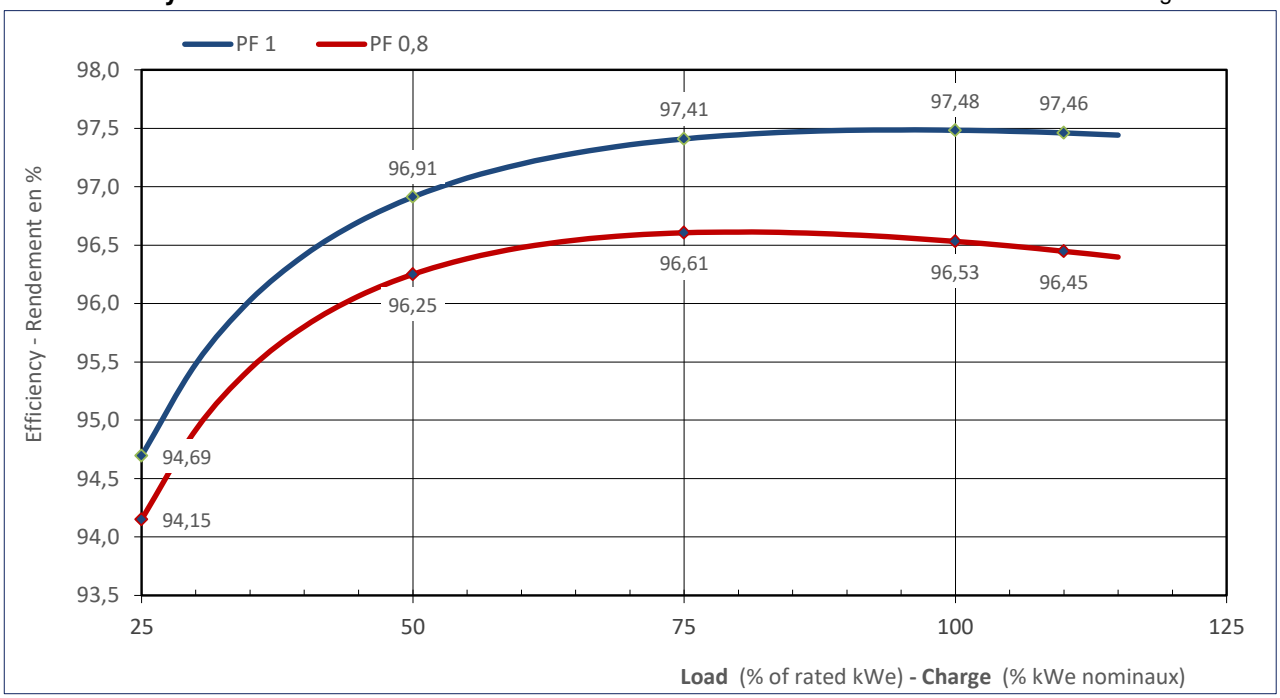
Capability Curve

Umax	+ 5%	420	V
Un		**400**	V
Umin	- 5%	380	V



Efficiency Curves

According to: IEC



Baudouin MOTEURS

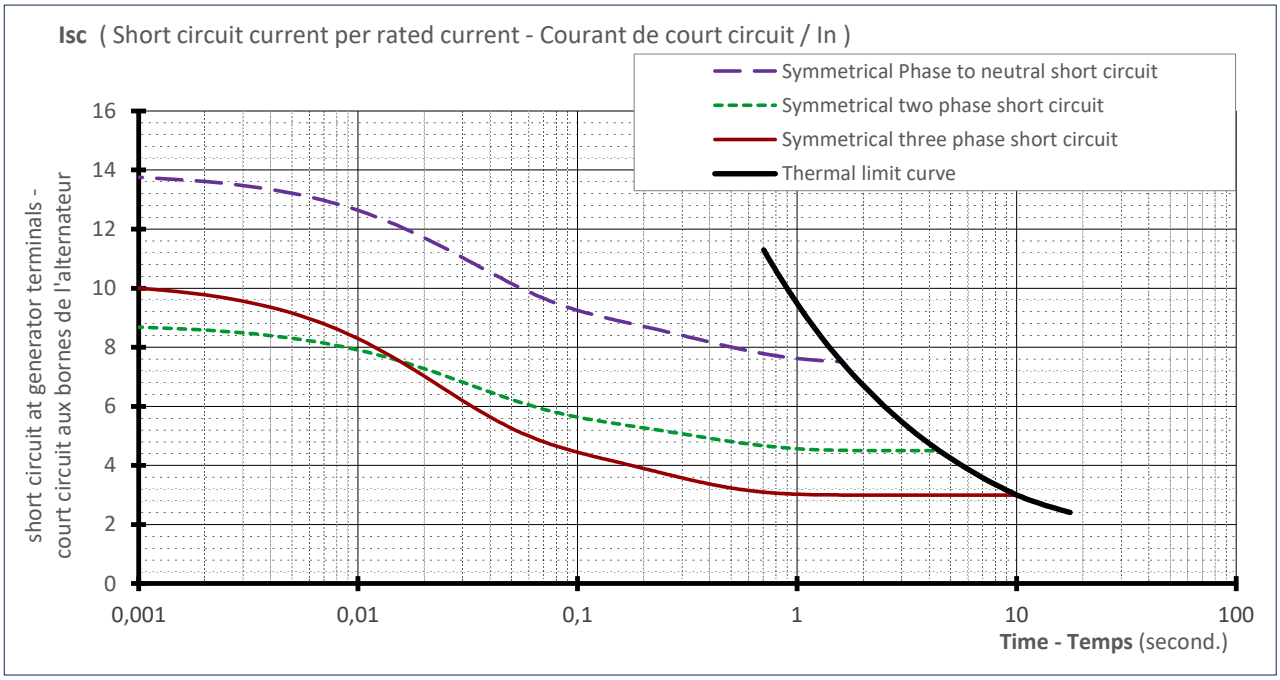
ALTERNATOR MAIN CURVES
WHA 52.3 L9

Date: 23-11-2023

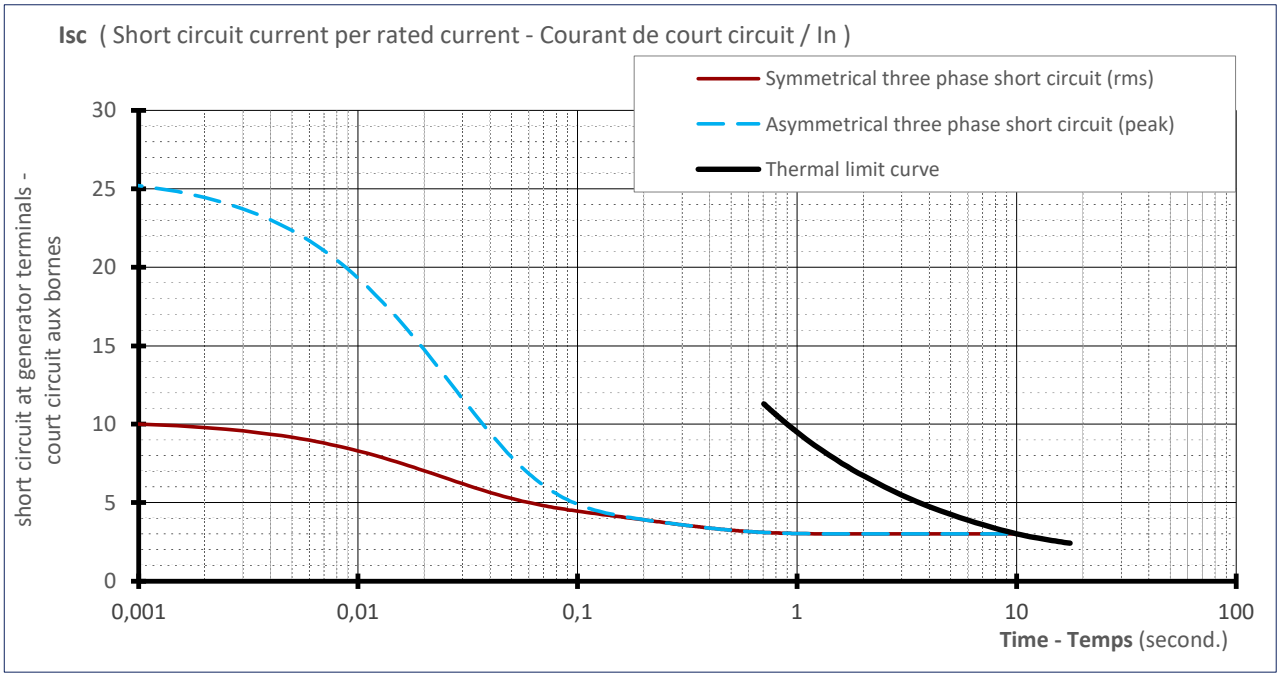
1750kVA - 400V - 50 Hz

Stator Current decrement curves

Symmetrical phase to neutral short-circu	initial	34 745	A	13,8 x In	In =	**2526** A
Symmetrical two phase short-circuit	max	21 923	A	8,7 x In		
Symmetrical three phase short-circuit	value	25 263	A	10 x In		
Thermal Limit						



Asymmetrical three phase short-circuit	IP	63 130	A	25 x In		



MOTEURS Baudouin

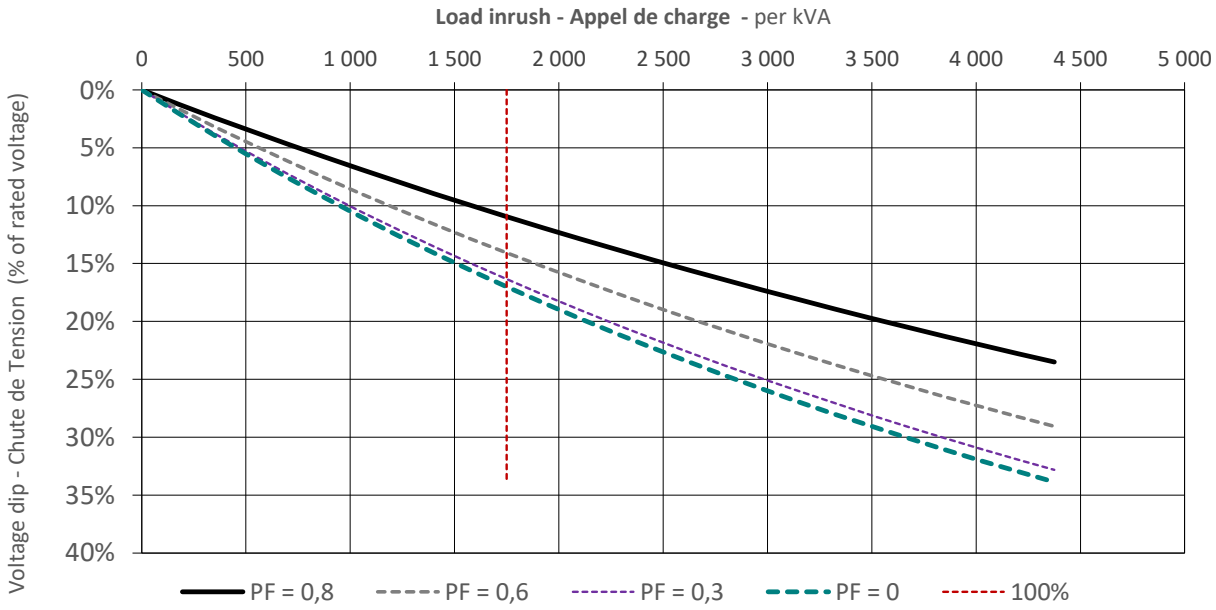
ALTERNATOR MAIN CURVES
WHA 52.3 L9

Date: 23-11-2023

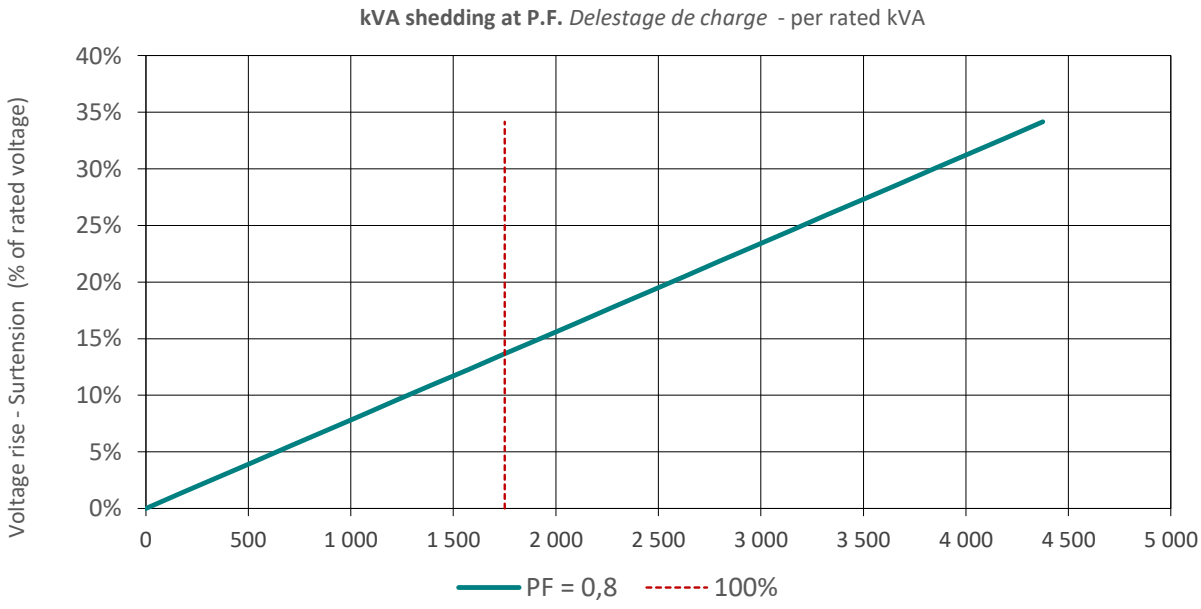
1750kVA - 400V - 50 Hz

Transient Voltage Variation

Transient voltage dip curve versus load impact



Transient voltage rise curve versus load rejection

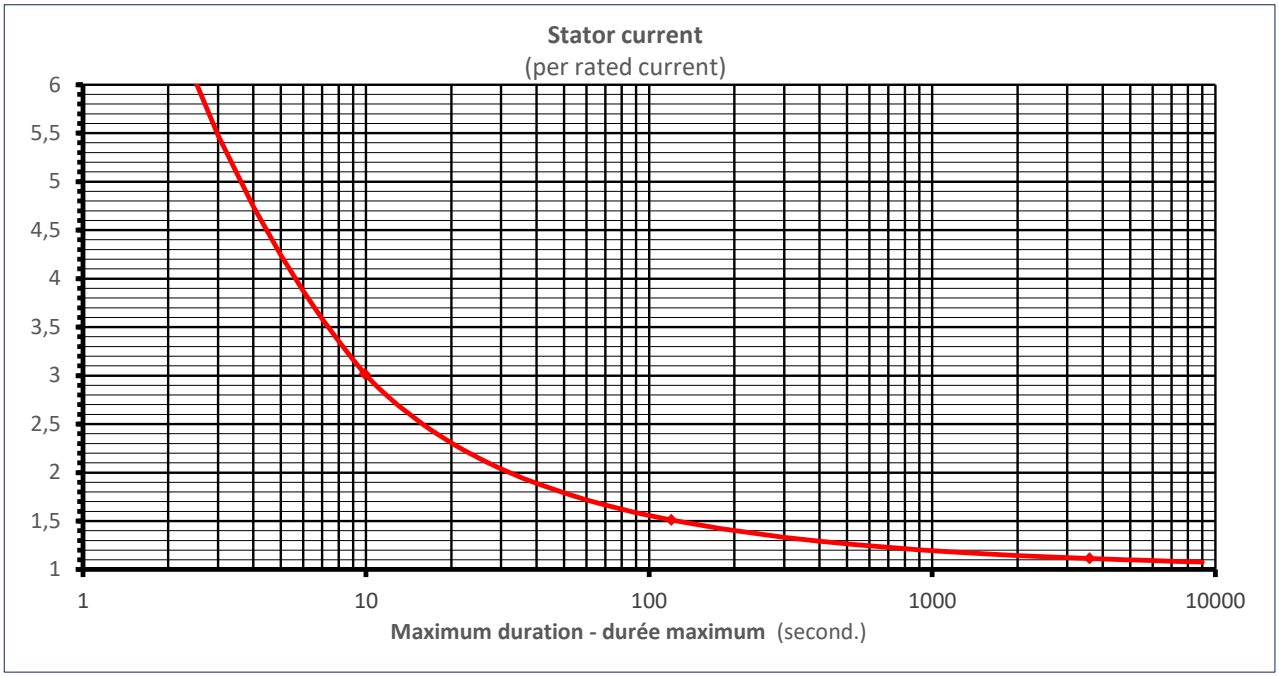


ALTERNATOR MAIN CURVES
WHA 52.3 L9

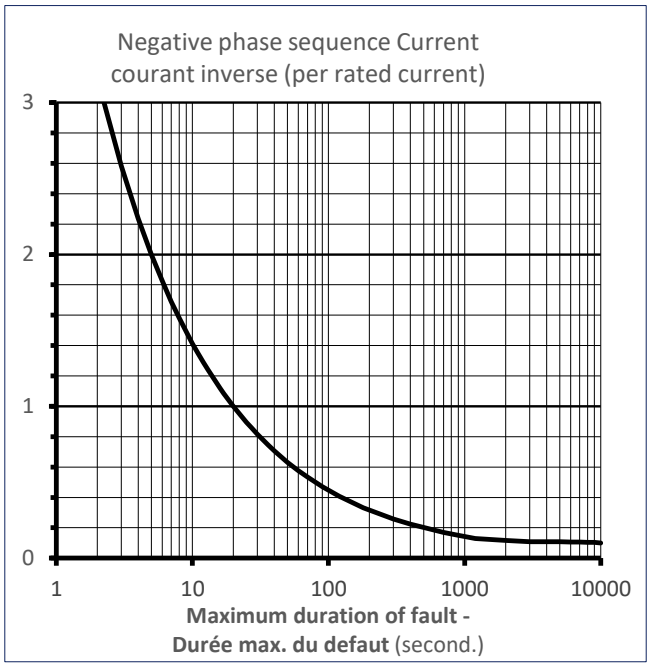
Date: 23-11-2023

1750kVA - 400V - 50 Hz

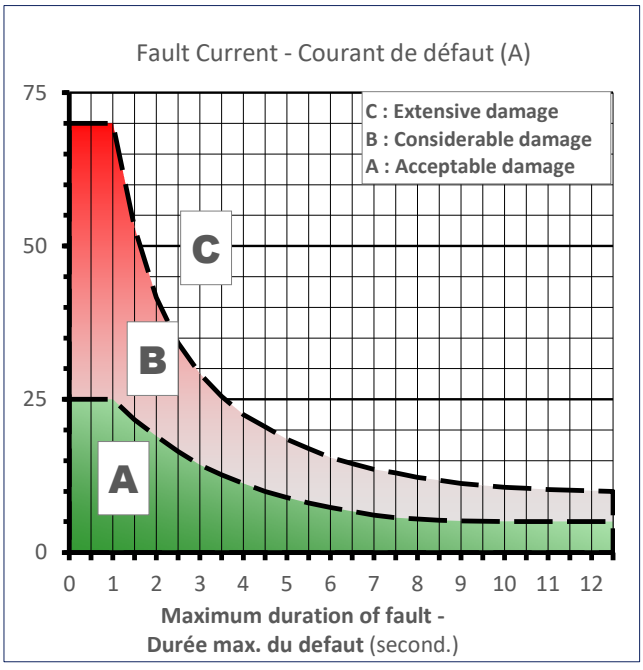
Thermal Damage Curve



Unbalance Load Curve



Stator Earth Fault Current



Controller data sheet

MOTEURS Baudouin

V01-12/2022

WHC 8620 MKII

SYNCHRONISING AUTO MAINS (UTILITY) FAILURE LOAD SHARE CONTROL MODULE

Module can be configured to function as a WHC**8610 MKII** Synchronising and Load Sharing Control Module

Refer to WHC8610 MKII Data Sheet for product features.

KEY FEATURES

- Comprehensive synchronising & loadsharing capabilities
- Built in governor and AVR control
- Base load (kW export) control
- Positive & negative kVAr export control
- Mains (Utility) decoupling protection
- Mains (Utility) failure detection
- Mains (Utility) power (kW, kV Ar, kV A & pf) monitoring
- Mains (Utility) de-coupling protection
- Mains (Utility) kW export protection
- Peak lopping & shaving functionality
- 4-Line back-lit LCD text display
- Multiple Display Languages
- Five key menu navigation
- LCD alarm indication
- Heated display option available
- Customisable power-up text and images
- WHCNet® expansion compatibility
- Data logging & trending facility
- Internal PLC editor
- Protections disable feature
- Fully configurable via PC using USB, RS232, RS485 & Ethernet communication
- Front panel configuration with PIN protection
- Power save mode
- 3 phase generator sensing and protection
- Generator current and power monitoring (kW, kvar, kVA, pf)
- kW and kvar overload alarms
- Reverse power alarms
- Over current protection
- Unbalanced load protection
- Independent earth fault protection
- Breaker control via fascia buttons
- Fuel and start outputs configurable when using CAN
- 8 configurable DC outputs
- 2 configurable volt-free relay outputs
- 4 configurable analogue/digital inputs
- Built in sensors to support 0 V to 10 V & 4 mA to 20 mA
- 12 configurable digital inputs
- Configurable 5 stage dummy load and load shedding outputs
- CAN, MPU and alternator frequency speed sensing in one variant
- Real time clock
- Manual and automatic fuel pump control
- Engine run-time scheduler
- Fuel usage monitor and low fuel level alarms
- Simultaneous use of all communication ports
- Remote SCADA monitoring via various WHC software applications
- MODBUS RTU & TCP support with configurable MODBUS pages for integration into building management systems (BMS)
- 3 configurable maintenance alarms
- Compatible with a wide range of CAN engines, including tier 4 engine support
- Uses WHC Configuration Suite PC Software for simplified configuration

KEY BENEFITS

- Can be configured for use as a WHC8610 MKII
- 132 x 64 pixel ratio display for clarity
- Real-time clock provides accurate event logging
- Ethernet communication, provides builit in advanced remote monitoring.
- Can be integrated into building management systems (BMS) and programmable logic control (PLC)
- Increased input and output expansion capability via DSENet®
- Licence-free PC software
- IP65 rating (with supplied gasket) offers increased resistance to water ingress
- Extended internal PLC editor allows user configurable functions to meet specific application requirements.

EXPANSION DEVICES

- WHC124 CAN/MSC Extender
- WHC2130 Input Expansion Module
- WHC2131 Ratio-metric Input Expansion Module
- WHC2133 RTD & Thermo-couple Expansion Module
- WHC2152 Ratio-metric Output Expansion Module
- WHC2157 Output Expansion Module
- WHC2548 LED Expansion

RELATED MATERIALS

TITLE	PART NO.
WHC8620 MKII Installation Instructions	053-183
WHC8620 MKII Operator Manual	057-254
WHC8620 MKII PC Configuration Suite Manual	057-238
WHC8610 MKII Data Sheet	055-204

SPECIFICATIONS

DC SUPPLY

CONTINUOUS VOLTAGE RATING
5 V to 35 V Continuous

CRANKING DROPOUTS
Able to survive 0 V for 100 mS, providing supply was at least 10 V before dropout and supply recovers to 5 V. This is achieved without the need for internal batteries.LEDs and backlight will not be maintained during cranking.

MAXIMUM OPERATING CURRENT
530 mA at 12 V, 280 mA at 24 V

MAXIMUM STANDBY CURRENT
320 mA at 12 V, 160 mA at 24 V

CHARGE FAIL/EXCITATION RANGE
0 V to 35 V

GENERATOR & MAINS (UTILITY)

VOLTAGE RANGE
15 V to 415 V AC (Ph to N)
26 V to 719 V AC (Ph to Ph)

FREQUENCY RANGE
3.5 Hz to 75 Hz

MAGNETIC PICKUP

VOLTAGE RANGE
+/- 0.5 V to 70 V

FREQUENCY RANGE
10,000 Hz (max)

INPUTS

DIGITAL INPUTS A TO L
Negative switching

ANALOGUE INPUTS A TO D
Configurable as:
Negative switching digital input
0 V to 10 V sensor
4 mA to 20 mA sensor
0 Ω to 480 Ω sensor

OUTPUTS

OUTPUT A & B (FUEL & START)
15 A DC at supply voltage

OUTPUTS C & D
8 A AC at 250 V AC (Volt-free)

AUXILIARY OUTPUTS E to L
2 A DC at supply voltage

BUILT IN AVR GOVERNOR CONTROL

MINIMUM LOAD IMPEDANCE
500 Ω
Fully isolated

GAIN VOLTAGE
0 V to 10 V DC
Fully isolated

OFFSET VOLTAGE
0 V to 10 V DC
Fully isolated

DIMENSIONS

OVERALL
245 mm x 184 mm x 51 mm
9.6” x 7.2” x 2.0”

PANEL CUT-OUT
220 mm x 160 mm
8.7” x 6.3”

MAXIMUM PANEL THICKNESS
8 mm
0.3”

STORAGE TEMPERATURE RANGE
-40 °C to +85 °C
-40 °F to +185 °F

OPERATING TEMPERATURE RANGE
-30 °C to +70 °C
-40 °F to +185 °F

HEATED DISPLAY VARIANT
-40 °C to +70 °C
-40 °F to +158 °F

Weichai Power Co.,Ltd
197 A,Fushou East Street,High-Tech Development Zone, Weifang,China 261061

MOTEURS Baudouin

V01-12/2022

WHC8620 MKII

SYNCHRONISING AUTO MAINS (UTILITY) FAILURE LOAD SHARE CONTROL MODULE

The WHC8620 MKII is an easy to use Synchronising Auto Mains (Utility) Failure Control Module suitable for paralleling single gensets (diesel or gas) with the mains (utility) supply. The controller can be configured for use as a WHC8610 MKII Auto Start Control Module. When converted for use as a WHC8610 MKII the unit provides generator to generator load share.

Designed to synchronise a single genset with a single mains (utility) supply the WHC8620 MKII will automatically control the change over from mains (utility) to generator supply or run the generator in synchronisation with the mains (utility) to provide no break, peak lopping and peak shaving power solutions.

System alarms are annunciated on the LCD screen (multiple language options available), illuminated LED and audible sounder.

Comprehensive communications are also available via RS232, RS485 and Ethernet for remote PC control and monitoring and integration into building management systems

The event log will record 250 events to facilitate easy maintenance, and an extensive number of fixed and flexible monitoring, metering and protection features are included.

Designed to offer increased built in support for active sensors for 0 V to 10 V & 4 mA to 20 mA. Comprehensive communication and system expansion options are available.

Using the WHC PC Configuration Suite Software allows easy alteration of the operational sequences, timers and alarms. With all communication ports capable of being active at the same time, the WHC8620 MKII is ideal for a wide variety of demanding load share applications.

KEY LOAD SHARE FEATURES:

- Peak lopping/sharing (with appropriate WHC mains (utility) controller
- Manual voltage/frequency adjustment
- R.O.C.O.F. and vector shift protection
- Mains (Utility) decoupling
- Mains (Utility) decoupling test mode
- Direct governor and AVR control
- Volts and frequency matching
- kW and kvar load sharing

ENVIRONMENTAL TESTING STANDARDS

ELECTRO MAGNETIC COMPATIBILITY
BS EN 61000-6-2
EMC Generic Immunity Standard for the Industrial Environment
BS EN 61000-6-4
EMC Generic Emission Standard for the Industrial Environment

ELECTRICAL SAFETY
BS EN 60950
Safety of Information Technology Equipment, including Electrical Business Equipment

TEMPERATURE
BS EN 60068-2-1
Ab/Ae Cold Test -30 °C
BS EN 60068-2-2
Bb/Be Dry Heat +70 °C

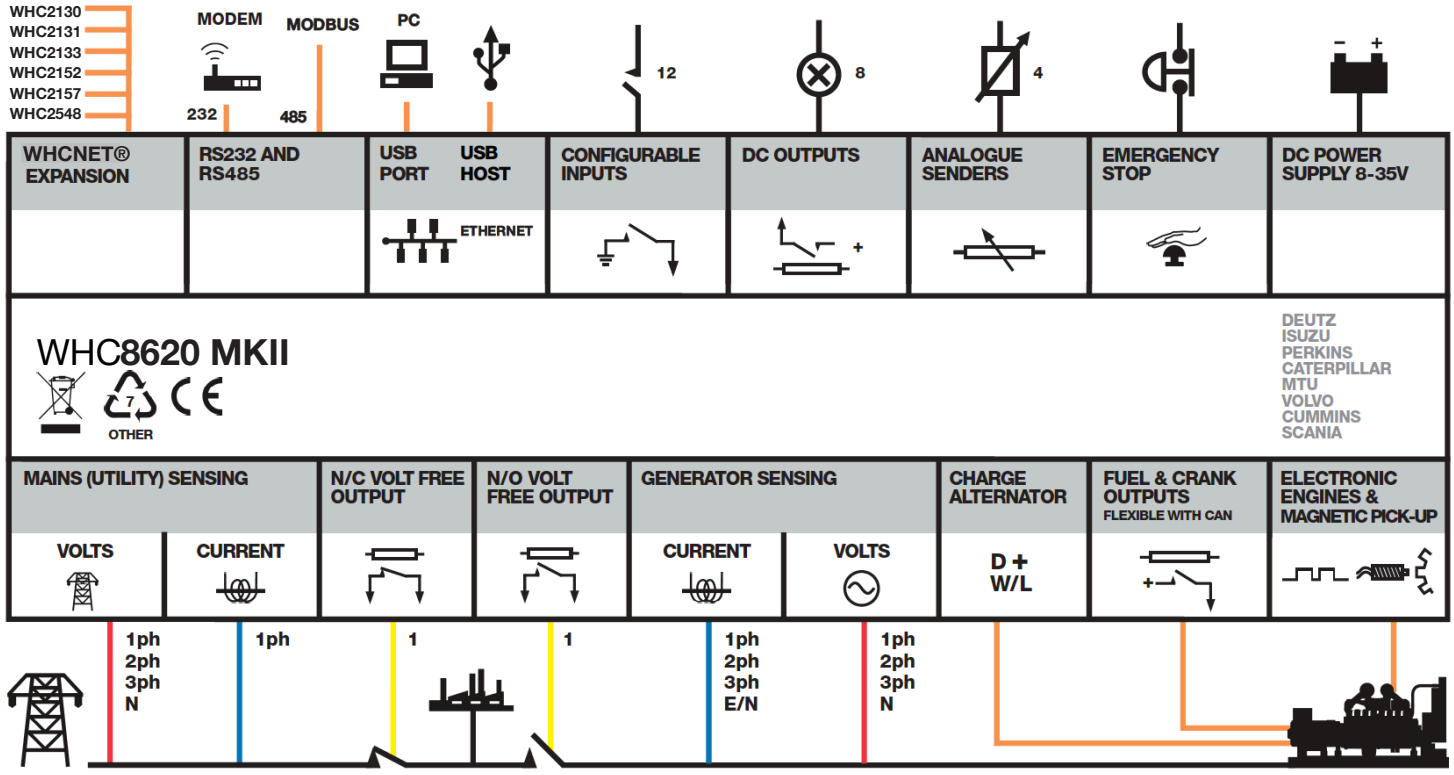
VIBRATION
BS EN 60068-2-6
Ten sweeps in each of three major axes
5 Hz to 8 Hz at +/-7.5 mm, 8 Hz to 500 Hz at 2 gn

HUMIDITY
BS EN 60068-2-30
Db Damp Heat Cyclic 20/55 °C at 95% RH 48 Hours
BS EN 60068-2-78
Cab Damp Heat Static 40 °C at 93% RH 48 Hours

SHOCK
BS EN 60068-2-27
Three shocks in each of three major axes
15 gn in 11 mS

DEGREES OF PROTECTION PROVIDED BY ENCLOSURES
BS EN 60529
IP65 - Front of module when installed into the control panel with the supplied sealing gasket.

COMPREHENSIVE FEATURE LIST TO SUIT A WIDE VARIETY OF LOAD SHARE APPLICATIONS



PowerKit Engine

Exhaust Gas Emissions

Test Report

Baudouin	Model : **16M33G1900/5**	Date : 15/02/23
	PowerKit Engine **Exhaust Gas Emissions Test Report**	Page : 1 / 1

Engine Basic data

Engine model	16M33G1900/5
Max Rated Power of Engine on Test Bench at 1500 Rpm @ kWm	1680
N° of Cylinders / Valves	16 / 64
Cylinders arrangement	At Vee
Displacement (L)	52.3
Thermodynamic Cycle	Diesel 4 stroke
Cooling System	Liquid (water + 50% antifreeze)
Injection System	Direct
Fuel System	High Pressure Common Rail
Aspiration	Turbocharged and Aftercooled
Fuel type	Diesel

Test information

Test Date	10/05/22
Test Cell n°	F11
Test Procedure	ISO 8178*(1)

Measured data*(2)(3)

NOx (gr/kWh)	**15.55**
NOx (mgr/Nm³)	**1572.5**
PM (gr/kWh)	**0.05**
PM (mgr/Nm³)	——
CO (gr/kWh)	**1.24**
CO (mgr/Nm³)	**291.5**
HC (gr/kWh)	**0.108**
HC (mgr/Nm³)	**15.76**

* Notes: 1. Steady-Stage emissions recorded per ISO8178-1 during operation at rated engine speed (+/2%) and stated constant load (+/-2%) with engine temperatures, pressures and emission rates stabilized.

2. mg/Nm3 and PPM values are measured dry and corrected to 5% O2 content and tested in standby power. gr/kWh values are tested in a duty cycle according to ISO8178.

3. This data was taken from a single engine test according to the Test Methods and Conditions specified.This data is subject to instrumentation, measurement, and engine-to-engine variability. Field emissions test data is not guarantee to these levels. For air permit programs, please contact Application Engineering for expected site variation.