

## Model: P16.5D5

Powered by PERKINS

### Output Rating

MODEL		Power rating		Voltage available		
		PRIME(1)	STANDBY(2)			
P16.5D5	400V/50HZ	12KW	13KW	380/220V	400/230V	415/240V
	PF:0.8	15KVA	16.55KVA			

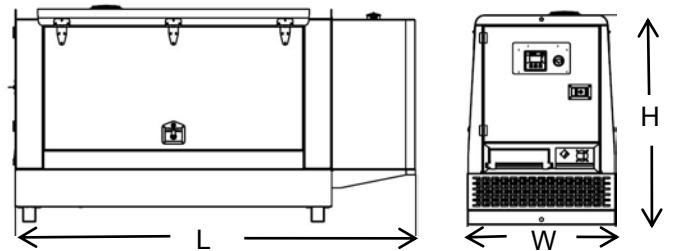
### General Information

Model	P16.5D5	
Engine	403A-15G2	
Speed control type	Mechanical	
Phase	3	
Control System	Digital	
System voltage	12V	
Frequency	50HZ	
Engine Speed(RPM)	1500	
Fuel Consumption (L/H)	Standby power(2)	6
	Prime Power(1)	5
	75% prime power	NA
	50% prime power	NA



### Dimension and Weight

Dimension	Open	Silent
Length (L)	1520mm	1900mm
Width (W)	550mm	730mm
Height (H)	1250mm	1140mm
Net Weight	480KG	603KG



AGG POWER gensets are compliant with EC mark which include the following directives:

- \* 2006/42/EC Machinery safety.
- \* 2006/95/EC Low voltage
- \* EN 60204-1: 2006+A1:2009, EN ISO 12100:2010, EN ISO 13849-1: 2008, EN 12601: 2010

#### (1) Prime Power (PRP):

According to ISO 8528-1:2005, Prime power is the maximum power which a generating set is capable of delivering continuously whilst supplying a variable electrical load when operated for an unlimited number of hours per year under the agreed operation conditions with the maintenance intervals and procedures being carried out as prescribed by the manufacturer. The permissible average power output (Ppp) over 24h of operation shall not exceed 70% of the PRP.

#### (2) Standby Power (ESP):

According to ISO 8528-1:2005, standby power is the maximum power available during a variable electrical power sequence, under the stated operation conditions, for which a generating set is capable of delivering in the event of a utility power outage or under test conditions for up to 200h of operation per year with the maintenance intervals and procedures being carried out as prescribed by the manufacturers. The permissible average power output over 24h of operation shall not exceed 70% of the ESP.



## Engine Specification

### Basic technical data

Number of cylinders ..... 3  
 Cylinder arrangement..... Vertical in-line  
 Cycle .....four stroke  
 Induction system..... Naturally aspirated  
 Compression ratio ..... 22.5:1  
 Bore ..... 84 mm  
 Stroke ..... 90 mm  
 Displacement..... 1.496 litres  
 Direction of rotation... anti-clockwise when viewed from flywheel  
 Firing order ..... 1, 2, 3  
 Estimated total weight (dry) ..... 197 kg

### Lubrication system

#### Lubricating oil capacity

Maximum sump capacity ..... 6.0 litres  
 Minimum sump capacity..... 4.5 litres

#### Maximum engine operating angles

-front up, front down, right side or left side ..... 35° continuous

#### Lubricating oil pressure

-relief valve opens ..... 262 - 359 kPa  
 Minimum oil pressure ..... 120 kPa  
 -at maximum no-load speed ..... TBA  
 Max. oil temperature - continuous operation ..... 125°C  
 Max. oil temperature - intermittent operation..... 135°C  
 Oil flow at rated speed. .... 10.9 litres /min

### Electrical System

-alternator ..... 15 amps, 12 V  
 -starter motor ..... 2 kW, 12 V

### General installation

Designation	Units	Type of operation and application	
		Prime	Stand-by
		50Hz	50Hz
Gross engine power	kWb	14	15.4
Brake mean effective pressure	kPa	746	820
Mean piston speed	m/s	4.5	
ElectropaK net engine power	kW	13.84	15.24
Engine coolant flow against 35 kPa restriction	l/min	40.3	
Combustion air flow	m <sup>3</sup> /min	1.0	TBA
Exhaust gas flow (max)	m <sup>3</sup> /min	2.2	TBA
Exhaust gas temperature (max)	°C	470	580
Overall thermal efficiency	%	33.35	33.42
Typical genset electrical output (0.8 pf 25°C)	kWe	12.04	13.26
	kVA	15.05	16.57
Assumed alternator efficiency	%	87	
Energy balance			
Energy in fuel (heat of combustion)	kW	41.5	45.6
Energy in power output (gross)	kW	14.0	15.4
Energy to cooling fan	kWt	0.16	
Energy in power output (nett)	kWm	13.84	15.24
Energy to coolant and lubricating oil	kW	13.3	14.6
Energy to exhaust	kW	10.7	11.6
Energy to radiation	kW	3.5	4.0

### Exhaust system

Maximum back pressure ..... 10.2 kPa  
 Exhaust outlet size..... 42 mm

### Fuel system

Type of injection ..... Indirect injection  
 Fuel injection pump..... Cassette type  
 Fuel injector ..... Pintle nozzle  
 Nozzle opening pressure ..... 14.7 MPa  
 Max particle size ..... 25 microns

### Cooling system

#### Radiator

-face area ..... 0.167 m<sup>2</sup>  
 -rows and materials ..... 2 rows, Aluminium  
 -matrix density and material ..... 4.5 fins per inch, Aluminium  
 -width of matrix ..... 334.2 mm  
 -height of matrix..... 500.0 mm  
 -pressure cap setting..... 90 kPa  
 Estimated cooling air flow reserve..... 0.125 kPa

#### Coolant

Total system capacity  
 With radiator ..... 6.0 litres  
 Without radiator ..... 2.6 litres  
 Maximum top tank temperature..... 112°C  
 Max static pressure head on pump ..... 30.4 kPa  
 Temperature rise across engine..... 5.1°C  
 Max permissible external system resistance..... TBA kPa  
 Thermostat operation range ..... 82 - 95°C



## ▪ Alternator

Alternator		
Poles	Num	4
Winding Connections (standard)		Star-serie
Insulation	Class	H class
Enclosure (according IEC-34-5)		IP23
Exciter System		Brushless
Voltage Regulator		A.V.R.
Bearing		Single bearing
Coupling		Flexible disc
Coating type		Standard (Vacuum impregnation)

## ▪ Options

Engine	Alternator	Generator Sets	Fuel System	Canopy
<ul style="list-style-type: none"> <li>•Water Jacket Preheater</li> <li>•Oil Preheater</li> </ul>	<ul style="list-style-type: none"> <li>•Winding Temperature measuring Instrument</li> <li>•Alternator Preheater</li> <li>•PMG</li> <li>•Anti-damp and anti-corrosion treatment</li> <li>•Anti-condensation heater</li> </ul>	<ul style="list-style-type: none"> <li>•Tools with the machine</li> </ul>	<ul style="list-style-type: none"> <li>• Low fuel level alarm</li> <li>•Automatic fuel feeding system</li> <li>•Fuel T-valves</li> </ul>	<ul style="list-style-type: none"> <li>•Rental Type Canopy</li> <li>•Trailer</li> </ul>
Lubricating System	Exhaust System	Cooling System	Control Panel	Voltages
<ul style="list-style-type: none"> <li>•Oil with the machine</li> </ul>	<ul style="list-style-type: none"> <li>•Protection board from hotness</li> </ul>	<ul style="list-style-type: none"> <li>• Front heat protection</li> <li>• Coolant (-30°C)</li> </ul>	<ul style="list-style-type: none"> <li>•Remote control panel</li> <li>• ATS</li> <li>• Remote controller</li> <li>• Synchronizing controller</li> </ul>	<ul style="list-style-type: none"> <li>• 415/240V</li> <li>• 380/220V</li> <li>• 220/127V</li> <li>• 220/127V</li> <li>• 200-115V</li> </ul>



■ **Control Panel: AMF20**



**Benefits**

- Less wiring and components
- Integrated solution
- Less engineering and programming
- Perfect price/performance ratio

**Features**

- Support of engines equipped with Electronic Control Unit (J1939 interface)
- Comprehensive diagnostic messages; SPN/FMI codes; KWP2000 support
- Automatic or manual start/stop of the gen-set
- Push buttons for simple control, lamp test
- Graphic back-lit LCD display 128x64 pixels
- 6 LED indicators
- Parameters adjustable via keyboard or PC
- Generator C.B. and Mains C.B. control with feedback and return timer
- RS232 interface (AT-LINK CONV cable is necessary for IL-AMF 20)
- Modem communication support (IL-AMF 25 only)
- Dimensions 180x120 mm (front panel)
- Sealed to IP65

- Mains measurements (50/60 Hz): U1-U3, Hz
- Generator measurements (50/60 Hz): U1-U3, I1-I3, Hz, kW, kVAr, kWh
- Selectable protections alarm/shutdown
- 3 phase Generator protections
  - Over-/under voltage
  - Over-/under frequency
  - Current/voltage asymmetry
  - Overcurrent/overload
- 3 phase AMF function
  - Over-/under frequency
  - Over-/under voltage
  - Voltage asymmetry
- Configurable analog inputs
- Battery voltage, engine speed (pick-up) measurement
- Configurable programmable binary inputs and outputs
- Warm-up and cooling functions

**The Chart of Functions of IntelLite<sup>®</sup> Controllers**

FUNCTIONS/CONTROLLERS	IL-AMF 20	IL-AMF 25	IL-MRS 10	IL-MRS 15	IL-MRS 11	IL-MRS 16
Binary inputs/outputs	7 / 7	7 / 7	6 / 6	6 / 6	6 / 6	6 / 6
Analog inputs	3	3	3	3	3	3
Pick-up	•	•	•	•	•	•
AMF function	•	•	-	-	-	-
Input configuration	•	•	•	•	•	•
Output configuration	•	•	•	•	•	•
Voltage measurement Gen./Mains	3ph / 3ph	3ph / 3ph	3ph / -	3ph / -	3ph / -	3ph / -
Current measurement	3ph	3ph, IDMT overcurrent	3ph	3ph, IDMT overcurrent	3ph	3ph, IDMT overcurrent
kW/kWh measurement	• / -	• / •	• / -	• / •	• / -	• / •
GCB/MCB control with feedback	• / •	• / •	- / -	- / -	• / -	• / -
Extension units (periph.)	-	IGL-RA15, IG-IOM, IGS-PTM	-	IGL-RA15, IG-IOM, IGS-PTM	-	IGL-RA15, IG-IOM, IGS-PTM
Communication interfaces	RS232 <sup>2)</sup>	RS232, CAN <sup>3)</sup>	RS232 <sup>2)</sup>	RS232, CAN <sup>3)</sup>	RS232 <sup>2)</sup>	RS232, CAN <sup>3)</sup>
Modem support	-	•	-	•	-	•
Battery charging alternator circuit	•	•	•	•	•	•

Key: • included; - excluded  
 1) GCB control, but without feedback  
 2) For IL-AMF 20, IL-MRS 10/11 AT-LINK CONV cable necessary  
 3) CAN for periph.

Legend: IG-IOM/IGS-PTM: I/O extension modules  
 IGL-RA15: Remote annunciator  
 I-RD: Remote display

