

## Model: P110D5

Powered by PERKINS

### Output Rating

MODEL		Power rating		Voltage available		
		PRIME(1)	STANDBY(2)			
P110D5	400V/50HZ	80KW	88KW	380/220V	400/230V	415/240V
	PF:0.8	100KVA	110KVA			

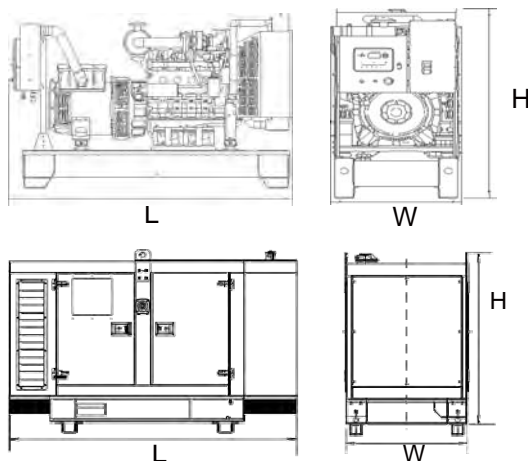
### General Information

Model	P110D5	
Engine	1104C-44TAG2	
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)	24.9
	Prime Power(1)	22.6
	75% prime power	17.1
	50% prime power	11.2



### Dimension and Weight

Dimension	Open	Silent
Length (L)	2210mm	2700mm
Width (W)	750mm	1100mm
Height (H)	1410mm	1700mm
Net Weight	1140KG	1725KG



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 .. 4  
 Cylinder arrangement .. In-line  
 Cycle .. Four stroke  
 Induction system .. Turbocharged, air-to-air charge cooled  
 Compression ratio .. 18:23 : 1  
 Bore .. 105 mm  
 Stroke .. 127 mm  
 Cubic capacity .. 4,4 litres  
 Direction of rotation .. Anticlockwise viewed on flywheel  
 Firing order .. 1, 3, 4, 2

### Exhaust system

Maximum back pressure @ 1500 rev/min .. 18 kPa  
 Maximum back pressure @ 1800 rev/min .. 15 kPa  
 Exhaust outlet size .. 64 mm

### Fuel system

Type of injection .. direct  
 Fuel injection pump .. rotary  
 Fuel atomiser .. multi-hole  
 Nozzle opening pressure .. 29,0 MPa

### Lubrication system

Lubricating oil capacity  
 Total system .. 8,0 litres  
 Sump capacity  
 -maximum .. 7 litres  
 -minimum .. 5,5 litres

### Cooling system

#### Radiator

-face area .. 0,25 m<sup>2</sup>  
 -rows and materials .. 38 aluminium  
 -matrix density and material .. 9.4 aluminium fins per inch  
 -width of matrix .. 439 mm  
 -height of matrix .. 570 mm  
 -pressure cap setting .. 100 kPa

#### Fan

-diameter .. 559 mm  
 -drive ratio .. 1:1  
 -number of blades .. 10  
 -material .. composite  
 -type .. pusher

#### Coolant

Total system capacity  
 -with radiator .. 12,6 litres  
 -without radiator .. 7,0 litres  
 Maximum top tank temperature .. 110 °C  
 Thermostat operation range .. 82 - 93 °C  
 Recommended coolant:  
 50% ethylene glycol with a corrosion inhibitor (BS 658 :1992 or MOD AL39) and 50% clean fresh water.

### Electrical System

-type .. Negative ground  
 -alternator .. 12V/24V options  
 -starter motor .. 12V/24V options

### General installation

Designation	Units	Type of operation and application			
		Prime	Stand-by	Prime	Stand-by
		50 Hz	50 Hz	60 Hz	60 Hz
Gross engine power	kWb	93,6	103	106,8	117,5
Brake mean effective pressure	kPa	1702	1873	1618	1780
Engine coolant flow 35 kPa system restriction	l/min	142		170	
Combustion air flow	m <sup>3</sup> /min	6,01	6,27	7,75	7,80
Exhaust gas flow (max)	m <sup>3</sup> /min	15,2	16,3	18,4	20,4
Exhaust gas temperature (max)	°C	514	543	517	574
Cooling fan air flow (200kPa External Restriction)	m <sup>3</sup> /min	165,6	165,6	225,6	225,6
Overall thermal efficiency (net)	%	39,5	39,6	36,9	36,9
Typical GenSet electrical output (0,8pf)	kWe	81,4	89,6	91,5	101,2
	kVA	101,4	111,9	114,4	126,5
Assumed alternator efficiency	%	90		90	
<b>Energy balance</b>					
Energy in fuel (Fuel heat of combustion)	kWt	228,1	251	275,2	304,4
Energy to power output (gross)	kWb	93,6	103,0	106,8	117,5
Energy to cooling fan	kWm	3,5		5,1	
Energy to power output (nett)	kWm	90,1	99,5	101,7	112,4
Energy to coolant and lubricating oil	kWt	46,1	50,7	57,7	64,0
Energy to exhaust	kWt	71,7	78,9	89,8	99,7
Energy to radiation	kWt	6,8	7,5	8,5	9,4
Energy to charge cooler	kWt	9,9	10,9	12,4	13,8



## ▪ 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

