



FES Support Services

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Project Name: Manchester - DWP

Offer no.: REN1197 - Manchester

04/09/2024

Your PV system from FES Support Services

Address of Installation

Oldham Rd,
Middleton,
Manchester
M24 1BE



Department for Work & Pensions

Project Description:

Installation of Solar PV at Manchester on behalf of DWP. This PV will help to decrease the site dependency on the grid and will help to input clean renewable energy into the building.

Project Overview

PV System

Grid-connected PV System with Electrical Appliances

Climate Data	Manchester-Ringway, GBR (1996 - 2015)
Values source	Meteonorm 8.1
PV Generator Output	40.05 kWp
PV Generator Surface	180.7 m ²
Number of PV Modules	89
Number of Inverters	1

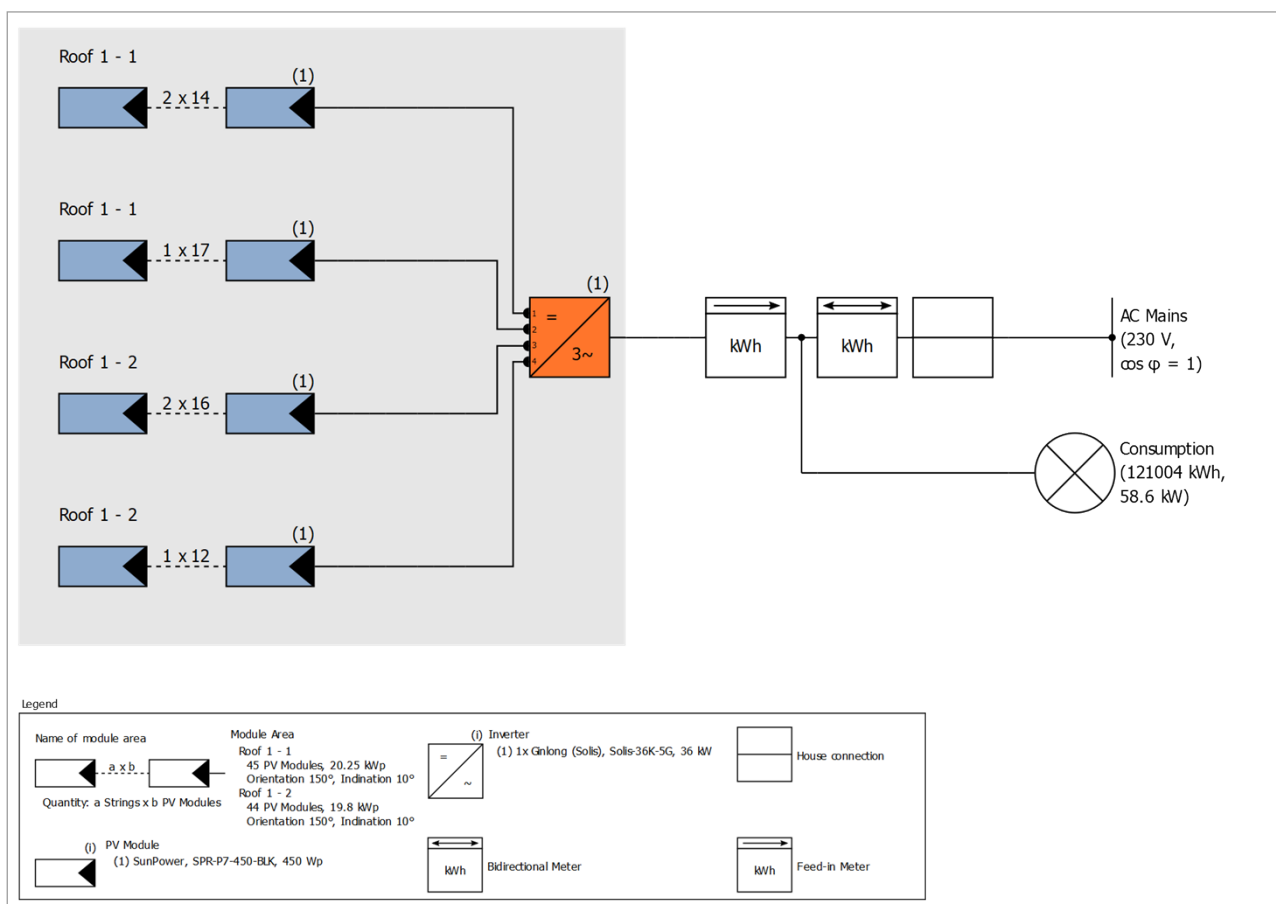


Figure: Schematic diagram



Production Forecast

Production Forecast

PV Generator Output	40.05 kWp
Spec. Annual Yield	929.70 kWh/kWp
Performance Ratio (PR)	93.48 %
PV Generator Energy (AC grid)	37,259 kWh/Year
Own Consumption	31,306 kWh/Year
Clipping at Feed-in Point	0 kWh/Year
Grid Export	5,953 kWh/Year
Own Power Consumption	84.0 %
CO ₂ Emissions avoided	8,676 kg / year
Level of Self-sufficiency	25.9 %

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

Set-up of the System

Overview

System Data

Type of System	Grid-connected PV System with Electrical Appliances
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Climate Data

Location	Manchester-Ringway, GBR (1996 - 2015)
Values source	Meteonorm 8.1
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Consumption

Total Consumption	121004 kWh
Half Hourly Data Manchester	121004 kWh
Load Peak	58.6 kW

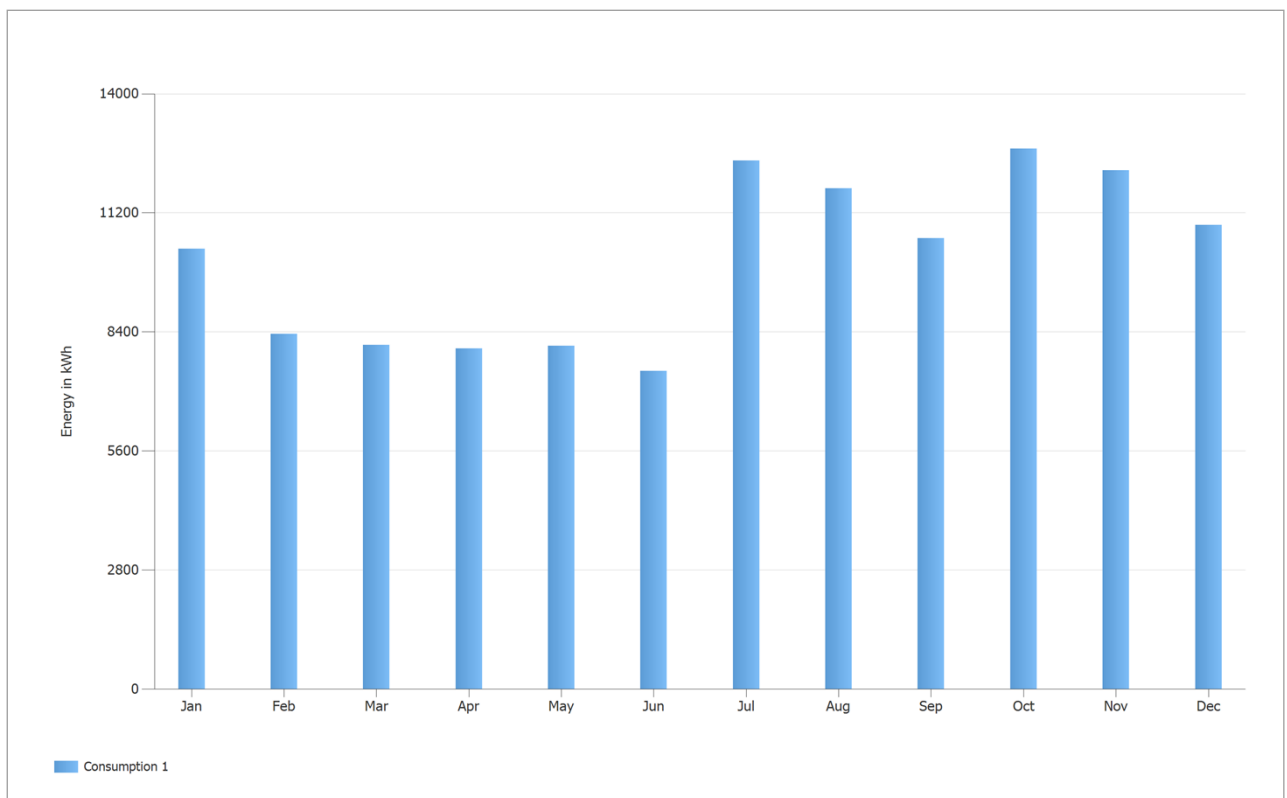


Figure: Consumption



Module Areas

1. Module Area - Roof 1 - 1

PV Generator, 1. Module Area - Roof 1 - 1

Name	Roof 1 - 1
PV Modules	45 x SPR-P7-450-BLK (v2)
Manufacturer	SunPower
Inclination	10 °
Orientation	Southeast 150 °
Installation Type	Roof parallel
PV Generator Surface	91.3 m ²

2. Module Area - Roof 1 - 2

PV Generator, 2. Module Area - Roof 1 - 2

Name	Roof 1 - 2
PV Modules	44 x SPR-P7-450-BLK (v2)
Manufacturer	SunPower
Inclination	10 °
Orientation	Southeast 150 °
Installation Type	Roof parallel
PV Generator Surface	89.3 m ²

Inverter configuration

Configuration 1

Module Areas	Roof 1 - 1 + Roof 1 - 2
Inverter 1	
Model	Solis-36K-5G (v2)
Manufacturer	Ginlong (Solis)
Quantity	1
Sizing Factor	111.2 %
Configuration	MPP 1: 2 x 14
	MPP 2: 1 x 17
	MPP 3: 2 x 16
	MPP 4: 1 x 12

AC Mains

AC Mains

Number of Phases	3
Mains voltage between phase and neutral	230 V
Displacement Power Factor (cos phi)	+/- 1

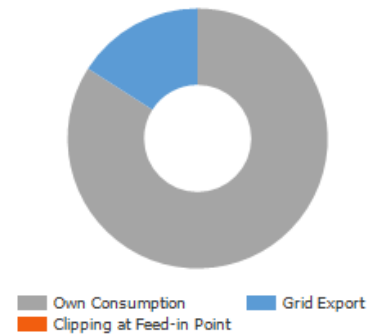
Simulation Results

Results Total System

PV System

PV Generator Output	40.05 kWp
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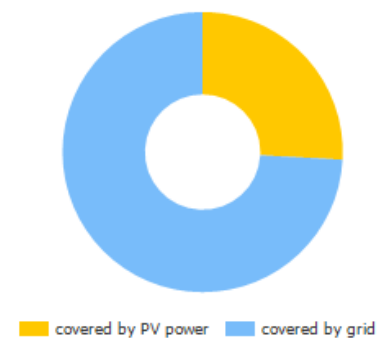
PV Generator Energy (AC grid)



Appliances

Appliances	121,004 kWh/Year
Standby Consumption (Inverter)	24 kWh/Year
Total Consumption	121,028 kWh/Year
covered by PV power	31,306 kWh/Year
covered by grid	89,722 kWh/Year
Solar Fraction	25.9 %

Total Consumption

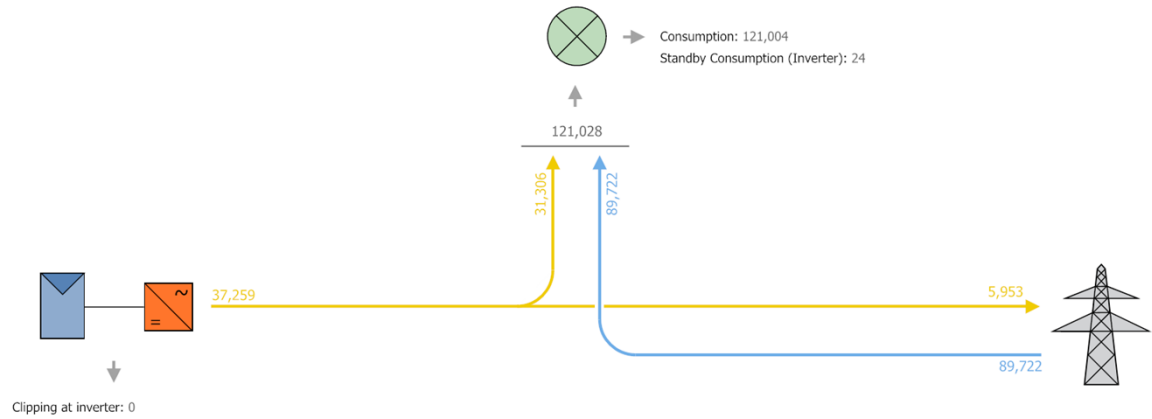


Level of Self-sufficiency

Total Consumption	121,028 kWh/Year
covered by grid	89,722 kWh/Year
Level of Self-sufficiency	25.9 %

Energy Flow Graph

Project: Manchester - DWP



All values in kWh
Small deviations in the totals can occur due to rounding
created with PV*SOL

Figure: Energy flow

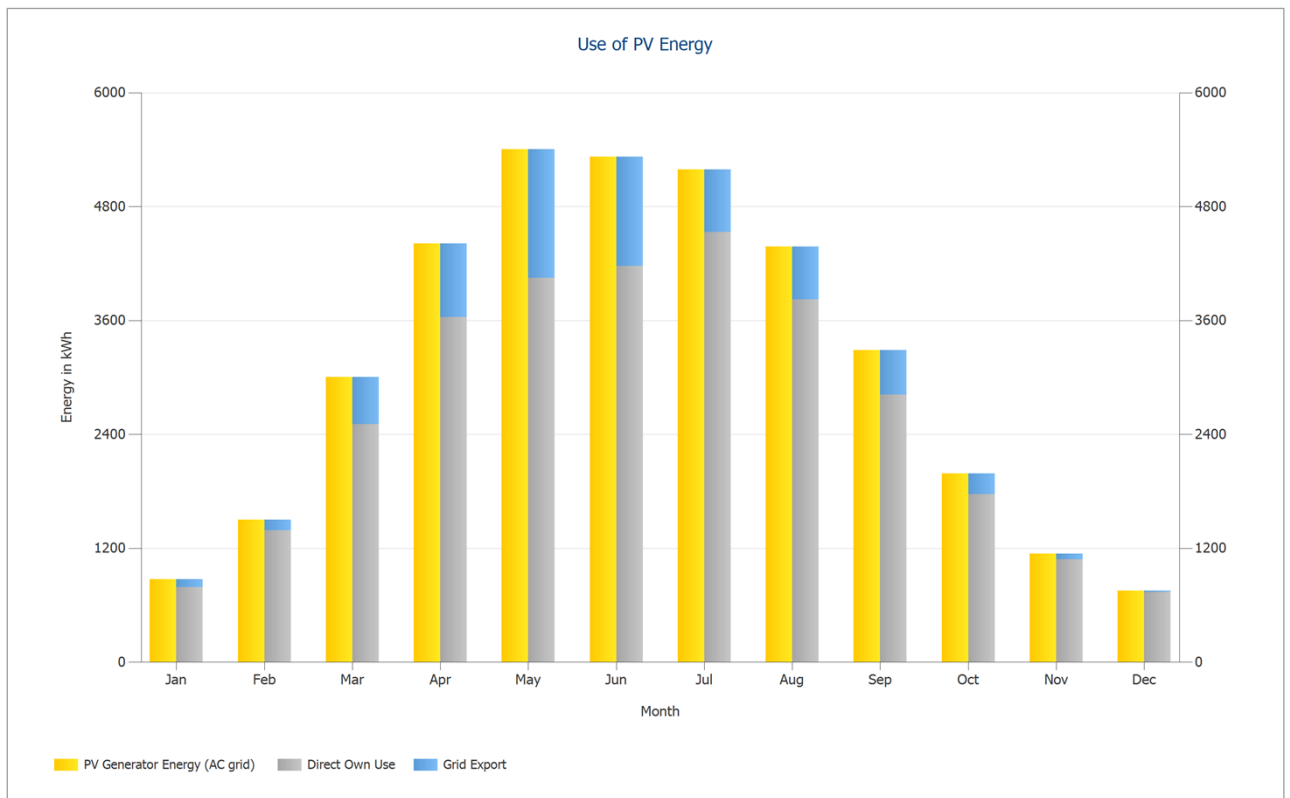


Figure: Use of PV Energy

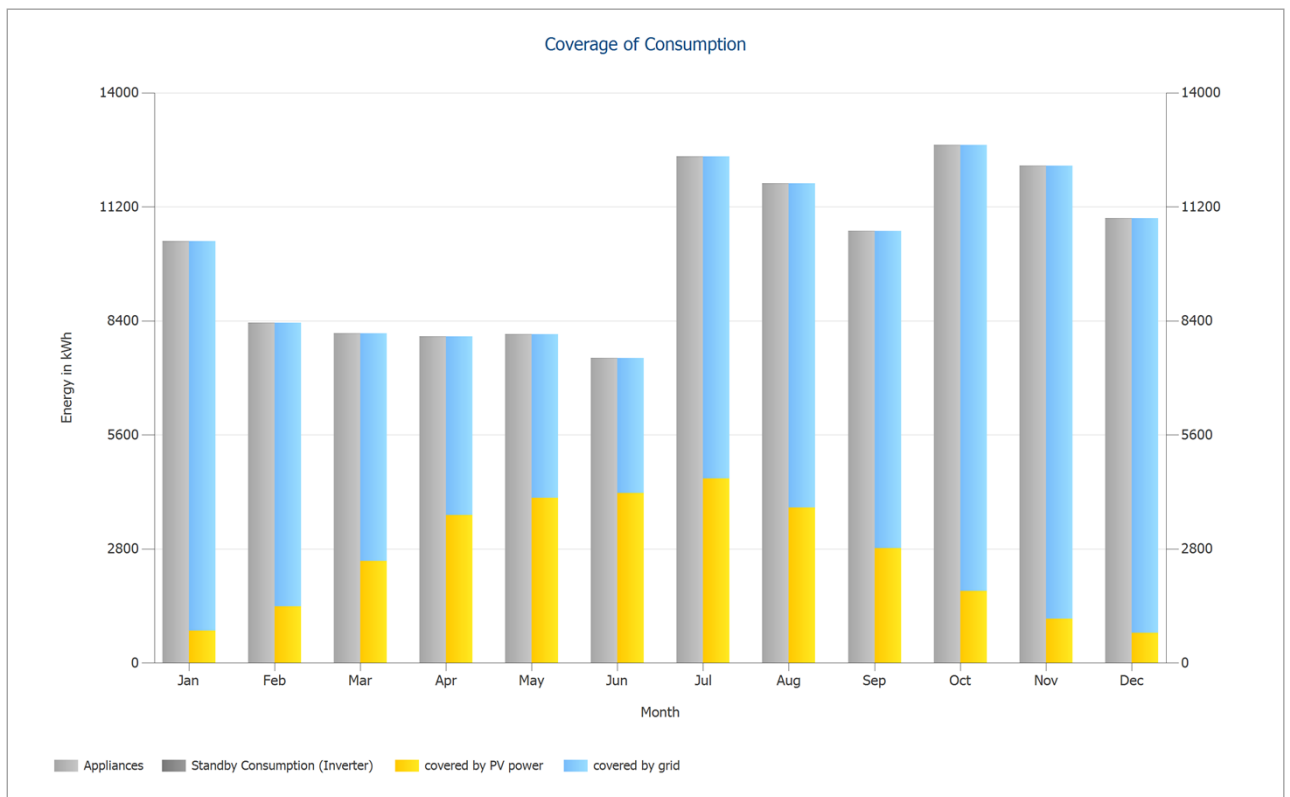


Figure: Coverage of Consumption



Plans and parts list

Circuit Diagram

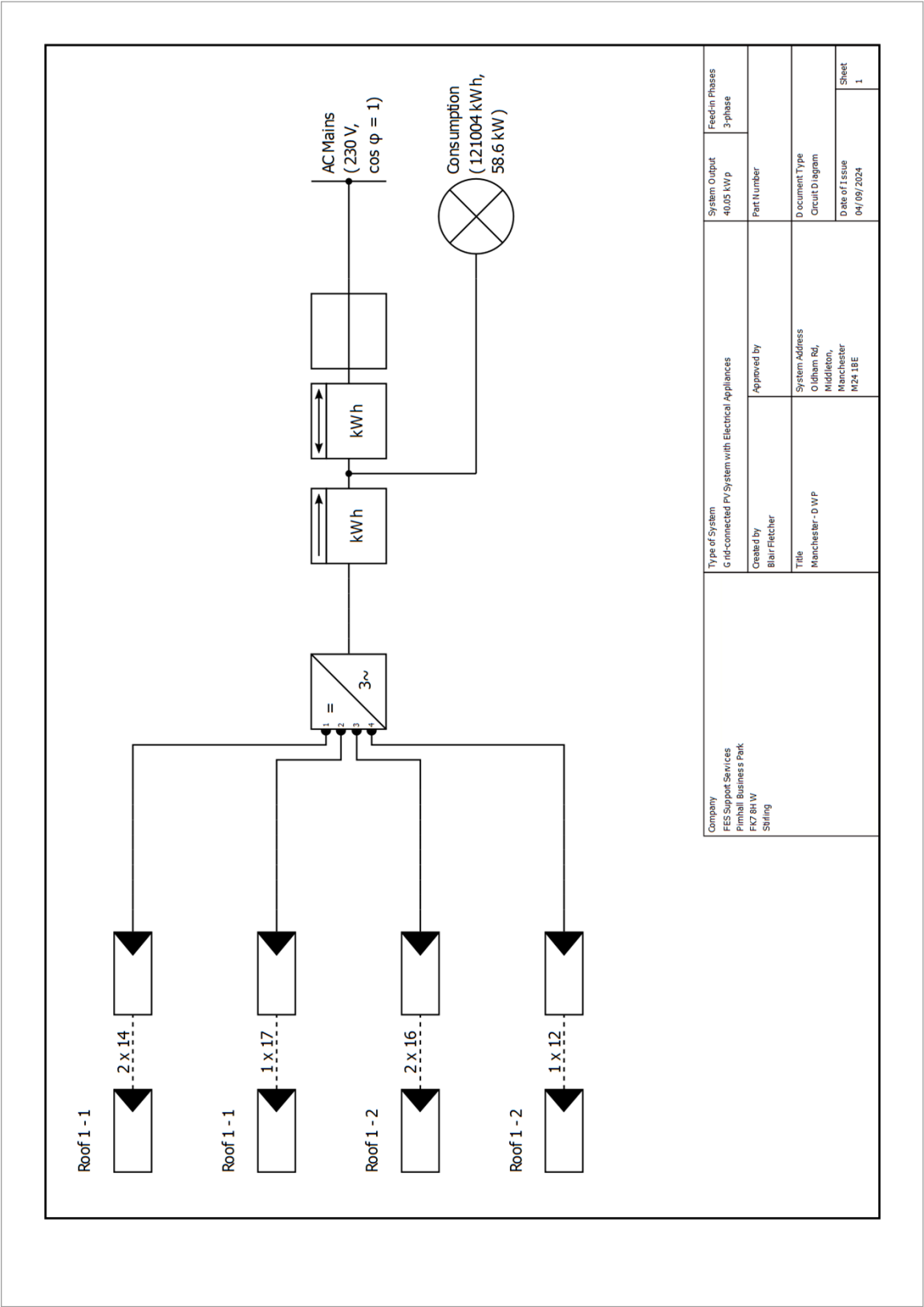


Figure: Circuit Diagram



Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		SunPower	SPR-P7-450-BLK	89	Piece
2	Inverter		Ginlong (Solis)	Solis-36K-5G	1	Piece
3	Components			Feed-in Meter	1	Piece
4	Components			Bidirectional Meter	1	Piece
5	Components			House connection	1	Piece