

# PVsyst - Simulation report

## Grid-Connected System

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Project: rice mill project

Variant: mill simulation

No 3D scene defined, no shadings

System power: 749 kWp

Uzogbon - Nigeria



## Project: rice mill project

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### PVsyst V7.4.7

VC0, Simulation date:  
20/07/25 10:31  
with V7.4.7

### Project summary

#### Geographical Site

Uzogbon

Nigeria

#### Situation

Latitude 6.73 °N

Longitude 6.45 °E

Altitude 75 m

Time zone UTC+1

#### Project settings

Albedo 0.20

#### Weather data

Uzogbon

Meteonorm 8.1, Sat=100% - Synthetic

### System summary

#### Grid-Connected System

#### No 3D scene defined, no shadings

#### PV Field Orientation

Fixed plane

Tilt/Azimuth 10 / 180 °

#### Near Shadings

No Shadings

#### User's needs

Fixed constant load

401 kW

Global

3510 MWh/Year

#### System information

##### PV Array

Nb. of modules 1292 units

Pnom total 749 kWp

##### Inverters

Nb. of units 40 units

Pnom total 600 kWac

Pnom ratio 1.249

##### Battery pack

Storage strategy: Self-consumption

Nb. of units 7760 units

Voltage 819 V

Capacity 12028 Ah

### Results summary

Produced Energy 1150649 kWh/year

Used Energy 3509931 kWh/year

Specific production 1536 kWh/kWp/year

Perf. Ratio PR 80.95 %

Solar Fraction SF 32.78 %

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## General parameters

## Grid-Connected System

No 3D scene defined, no shadings

## PV Field Orientation

## Orientation

Fixed plane

Tilt/Azimuth 10 / 180 °

## Sheds configuration

No 3D scene defined

## Models used

Transposition Perez

Diffuse Perez, Meteonorm

Circumsolar separate

## Horizon

Free Horizon

## Near Shadings

No Shadings

## User's needs

Fixed constant load

401 kW

Global

3510 MWh/Year

## Storage

Kind

Self-consumption

## Charging strategy

When excess solar power is available

## Discharging strategy

As soon as power is needed

## PV Array Characteristics

## PV module

Manufacturer

JA solar

Model

JAM78-S30-580-MR

(Original PVsyst database)

Unit Nom. Power

580 Wp

Number of PV modules

1292 units

Nominal (STC)

749 kWp

Modules

76 string x 17 In series

## At operating cond. (50°C)

Pmpp

684 kWp

U mpp

681 V

I mpp

1003 A

## Total PV power

Nominal (STC)

749 kWp

Total

1292 modules

Module area

3612 m<sup>2</sup>

## Inverter

Manufacturer

Huawei Technologies

Model

SUN2000-15KTL-M2-400V

(Original PVsyst database)

Unit Nom. Power

15.0 kWac

Number of inverters

40 units

Total power

600 kWac

Operating voltage

160-950 V

Max. power (=&gt;58°C)

16.5 kWac

Pnom ratio (DC:AC)

1.25

Power sharing within this inverter

## Total inverter power

Total power

600 kWac

Max. power

660 kWac

Number of inverters

40 units

Pnom ratio

1.25

## Battery Storage

## Battery

Manufacturer

Sony

Model

IJ1001M 24Ah

## Battery pack

Nb. of units

16 in series

x 485 in parallel

Discharging min. SOC

20.0 %

Stored energy

7585.2 kWh

## Battery input charger

Model

Generic

Max. charg. power

640.0 kWdc

Max./Euro effic.

97.0/95.0 %

## Battery to Grid inverter

Model

Generic

Max. disch. power

420.0 kWac

Max./Euro effic.

97.0/95.0 %

## Battery Pack Characteristics

Voltage

819 V

Nominal Capacity

12028 Ah (C10)

Temperature

Fixed 20 °C



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**Array losses**

**Array Soiling Losses**

Loss Fraction 3.0 %

**Thermal Loss factor**

Module temperature according to irradiance  
Uc (const) 29.0 W/m<sup>2</sup>K  
Uv (wind) 0.0 W/m<sup>2</sup>K/m/s

**DC wiring losses**

Global array res. 11 mΩ  
Loss Fraction 1.5 % at STC

**Serie Diode Loss**

Voltage drop 0.7 V  
Loss Fraction 0.1 % at STC

**LID - Light Induced Degradation**

Loss Fraction 2.0 %

**Module Quality Loss**

Loss Fraction -0.8 %

**Module mismatch losses**

Loss Fraction 2.0 % at MPP

**IAM loss factor**

Incidence effect (IAM): Fresnel smooth glass, n = 1.526

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.998	0.981	0.948	0.862	0.776	0.636	0.403	0.000



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### Main results

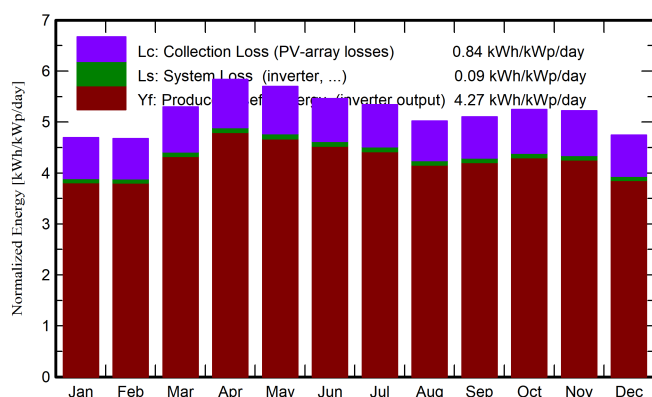
#### System Production

Produced Energy	1150649 kWh/year	Specific production	1536 kWh/kWp/year
Used Energy	3509931 kWh/year	Perf. Ratio PR	80.95 %
		Solar Fraction SF	32.78 %

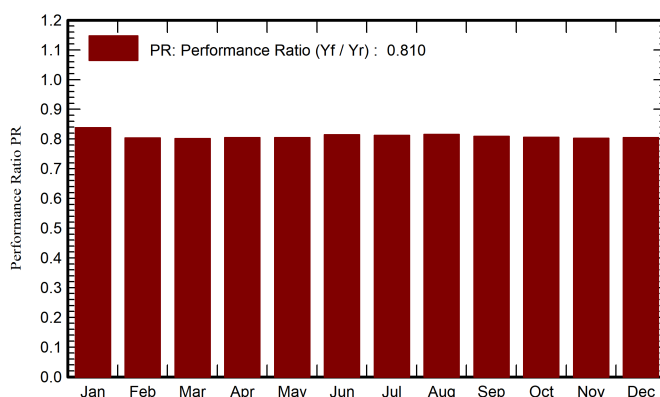
#### Battery aging (State of Wear)

Cycles SOW	99.8 %
Static SOW	90.0 %

Normalized productions (per installed kWp)



Performance Ratio PR



### Balances and main results

	GlobHor	DiffHor	T_Amb	GlobInc	GlobEff	EArray	E_User	E_Solar	E_Grid	EFrGrid
	kWh/m²	kWh/m²	°C	kWh/m²	kWh/m²	kWh	kWh	kWh	kWh	kWh
January	158.3	87.1	27.10	145.5	135.4	90503	298104	91386	0.000	206718
February	137.5	94.6	27.87	130.9	122.9	81629	269255	78831	0.000	190424
March	168.4	102.6	27.59	164.3	155.1	102637	298104	98617	0.000	199487
April	174.2	92.5	26.50	175.2	165.7	110065	288487	105619	0.000	182868
May	170.8	83.3	26.27	176.6	167.1	110930	298104	106412	0.000	191692
June	157.1	84.0	24.95	163.7	154.8	103950	288487	99949	0.000	188539
July	159.3	79.7	24.93	165.6	156.5	104944	298104	100805	0.000	197299
August	153.2	86.9	24.58	155.6	146.6	98738	298104	95091	0.000	203013
September	155.0	77.5	24.44	153.1	144.1	96666	288487	92832	0.000	195655
October	170.4	81.6	25.49	162.6	152.5	102091	298104	98189	0.000	199915
November	171.3	73.7	26.06	156.7	146.0	97753	288487	94262	0.000	194226
December	161.9	82.7	26.80	147.0	136.6	91483	298104	88657	0.000	209447
Year	1937.4	1026.1	26.04	1896.8	1783.2	1191388	3509931	1150649	0.000	2359281

#### Legends

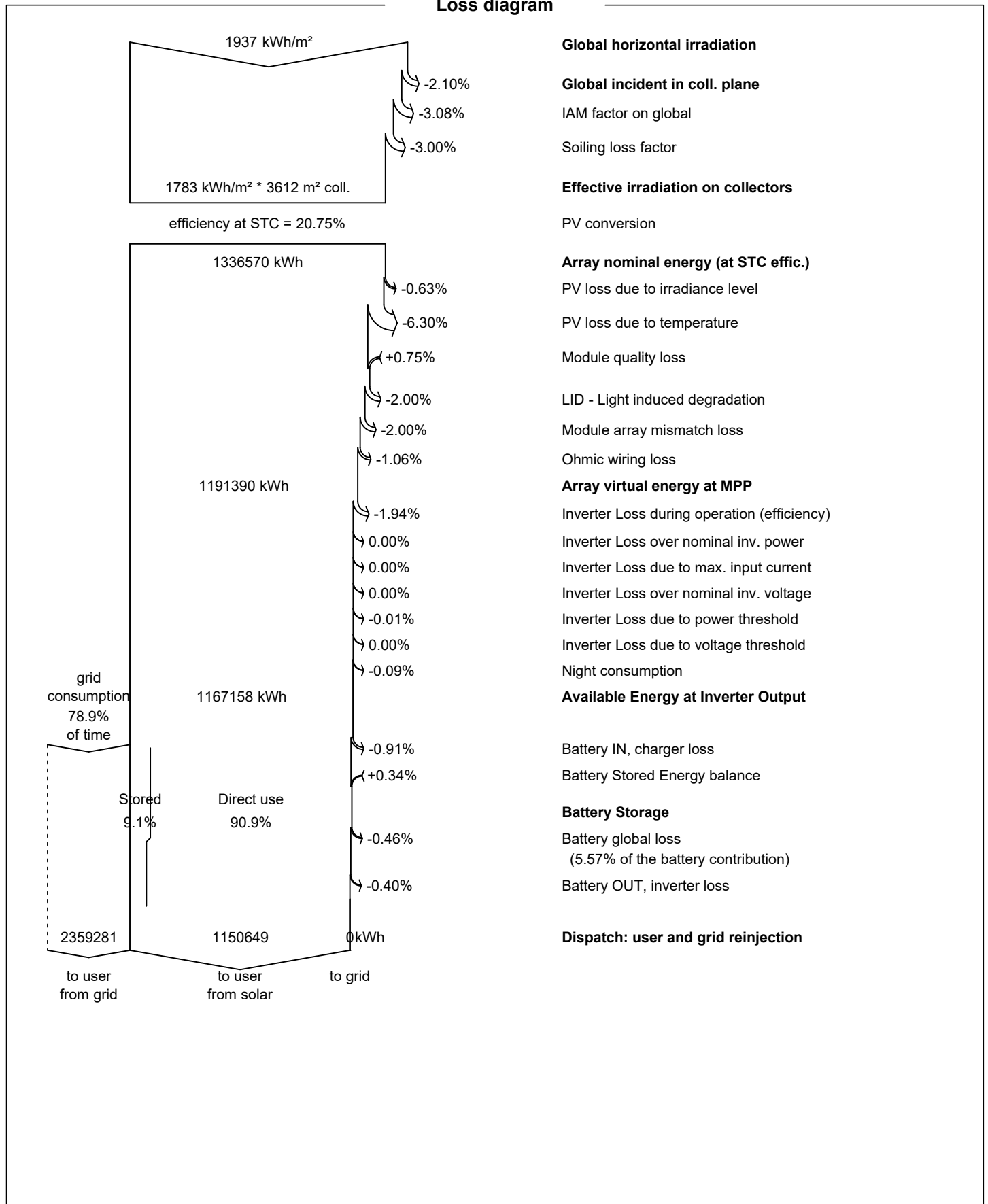
GlobHor	Global horizontal irradiation	EArray	Effective energy at the output of the array
DiffHor	Horizontal diffuse irradiation	E_User	Energy supplied to the user
T_Amb	Ambient Temperature	E_Solar	Energy from the sun
GlobInc	Global incident in coll. plane	E_Grid	Energy injected into grid
GlobEff	Effective Global, corr. for IAM and shadings	EFrGrid	Energy from the grid



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**Loss diagram**





PVsyst V7.4.7

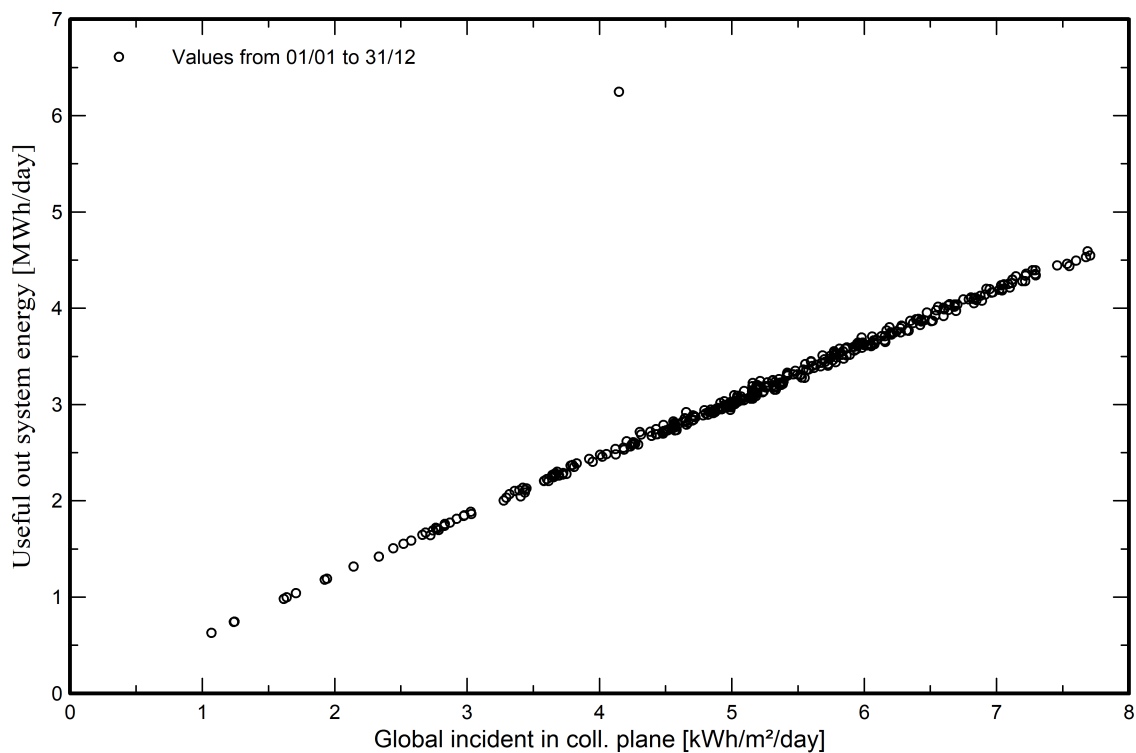
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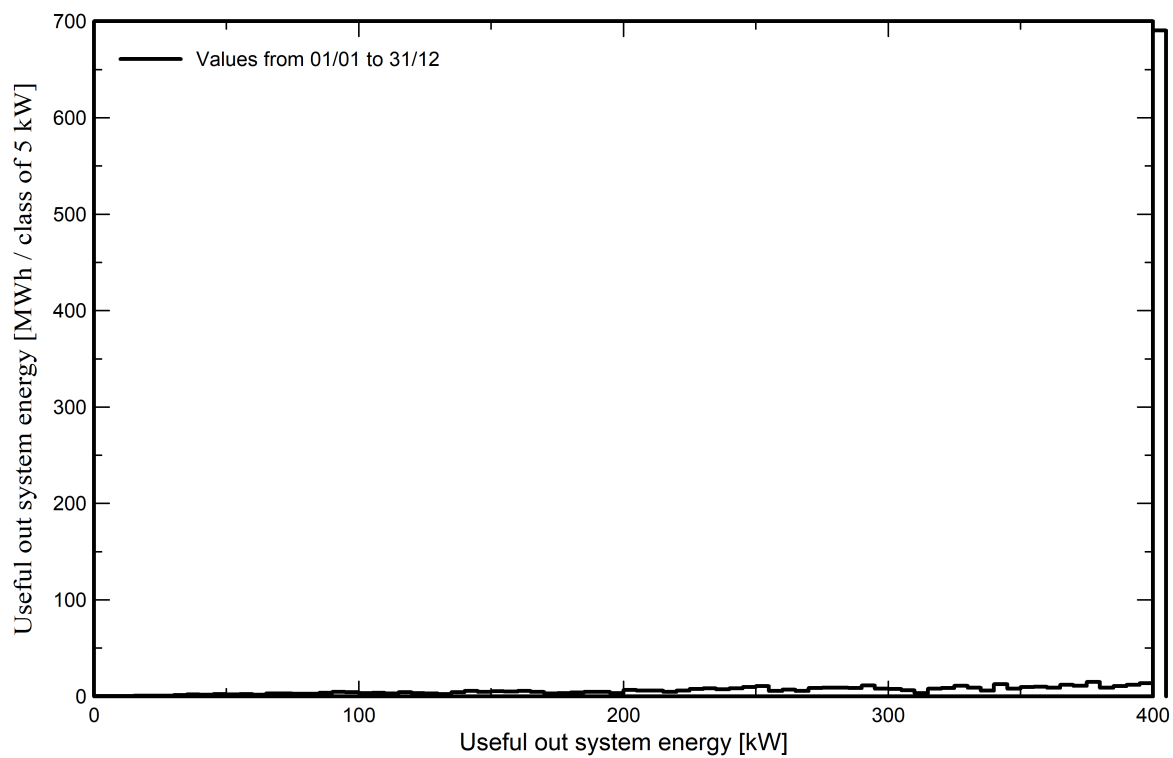
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### Predef. graphs

Daily Input/Output diagram



System Output Power Distribution

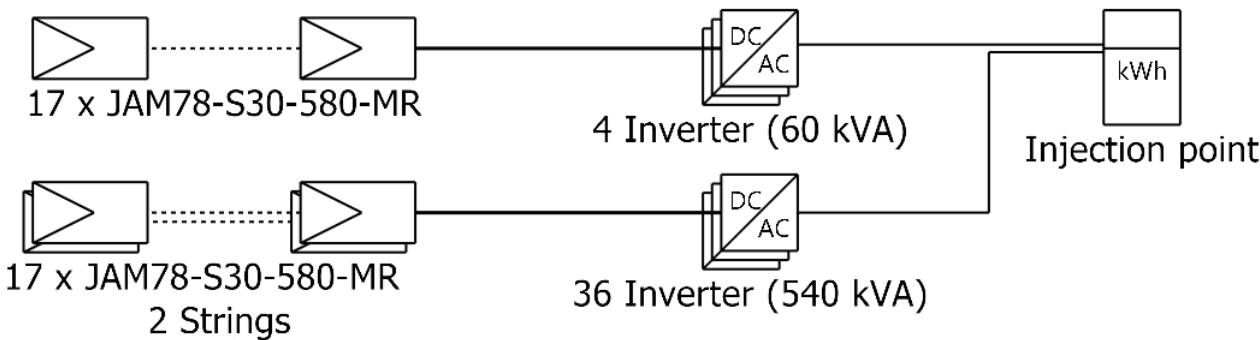




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# Single-line diagram



PV module	JAM78-S30-580-MR
Inverter	SUN2000-15KTL-M2-400V
String	17 x JAM78-S30-580-MR

rice mill project

VC0 : mill simulation

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