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SMART FOR TECHNOLOGIES

**Air Conditioner Energy Saver
Test Report**

Al Jimi Villa

Al Ain, United Arab Emirates



Introduction

The 1.5 Ton Split Air Conditioning Units used for this air conditioning Energy saving evaluation are in good condition and have been installed and maintained correctly in the **Bed Room** of Al Jimi Villa in AL Ain City.

The air conditioning energy saving evaluation was conducted over a period of **3 days** with the air conditioning energy saving system operating **21 Hours** with **Standard Energy Saving Mode**, **21 Hours** with **Pass Mode** and **21 Hours** with **Smart Energy Saving Mode**

The air conditioning energy savings for the whole period were **22.8 %** of kWh energy consumption in **Smart Energy Saving Mode**, and **12.26 %** of kWh in **Standard Energy Saving Mode**

This period of time for evaluation is always sufficient to obtain an indication of the likely kWh air conditioning energy savings, as in this case.



Photo of Smart Air Conditioning Energy Saver



Data Logger kWh Meter Readings

ENERGY SAVING SYSTEM STANDARD MODE	
Date and Time	kWh
4/26/2021 14:00	1.41
4/26/2021 15:00	1.42
4/26/2021 16:00	1.28
4/26/2021 17:00	1.00
4/26/2021 18:00	1.50
4/26/2021 19:00	1.48
4/26/2021 20:00	1.30
4/26/2021 21:00	1.58
4/26/2021 22:00	1.32
4/26/2021 23:00	1.32
4/27/2021 0:00	1.01
4/27/2021 1:00	1.21
4/27/2021 2:00	1.13
4/27/2021 3:00	1.16
4/27/2021 4:00	1.01
4/27/2021 5:00	1.02
4/27/2021 6:00	0.91
4/27/2021 7:00	1.10
4/27/2021 8:00	1.09
4/27/2021 9:00	1.20
4/27/2021 10:00	1.88
TOTAL kWh	26.33
Total AC Running Hours	21
kWh Per Hour	1.25

ENERGY SAVING SYSTEM BY PASS MODE	
Date and Time	kWh
4/27/2021 14:00	1.03
4/27/2021 15:00	2.00
4/27/2021 16:00	2.78
4/27/2021 17:00	1.72
4/27/2021 18:00	1.11
4/27/2021 19:00	2.05
4/27/2021 20:00	1.20
4/27/2021 21:00	1.42
4/27/2021 22:00	1.67
4/27/2021 23:00	1.56
4/28/2021 0:00	1.37
4/28/2021 1:00	0.93
4/28/2021 2:00	1.36
4/28/2021 3:00	1.20
4/28/2021 4:00	1.26
4/28/2021 5:00	1.26
4/28/2021 6:00	1.26
4/28/2021 7:00	1.13
4/28/2021 8:00	1.25
4/28/2021 9:00	1.35
4/28/2021 10:00	1.13
TOTAL kWh	30.04
Total AC Running Hours	21
kWh Per Hour	1.43

ENERGY SAVING SYSTEM SMART MODE	
Date and Time	kWh
4/29/2021 14:00	1.40
4/29/2021 15:00	1.21
4/29/2021 16:00	1.28
4/29/2021 17:00	1.44
4/29/2021 18:00	1.50
4/29/2021 19:00	1.92
4/29/2021 20:00	1.16
4/29/2021 21:00	0.98
4/29/2021 22:00	1.11
4/29/2021 23:00	0.22
4/30/2021 0:00	0.17
4/30/2021 1:00	1.35
4/30/2021 2:00	1.06
4/30/2021 3:00	0.99
4/30/2021 4:00	1.07
4/30/2021 5:00	0.88
4/30/2021 6:00	1.09
4/30/2021 7:00	1.01
4/30/2021 8:00	0.97
4/30/2021 9:00	1.11
4/30/2021 10:00	1.57
TOTAL kWh	23.49
Total AC Running Hours	21
kWh Per Hour	1.12

Energy Saving Consumption Summary



Energy Consumption without our System for 21 Hours = **30.04 kWh**

Average Energy Consumption Per Hour = **1.43 kWh**

Energy Consumption with our System in Standard Mode for 21 Hours = **26.33 kWh**

Average Energy Consumption Per Hour = **1.25 kWh**

Energy Consumption with our System in Smart Mode for 21 Hours = **23.49 kWh**

Average Energy Consumption Per Hour = **1.11 kWh**

- (Standard Mode) Therefore: $1.43 - 1.25 = 0.18$ kWh AC Energy Saving

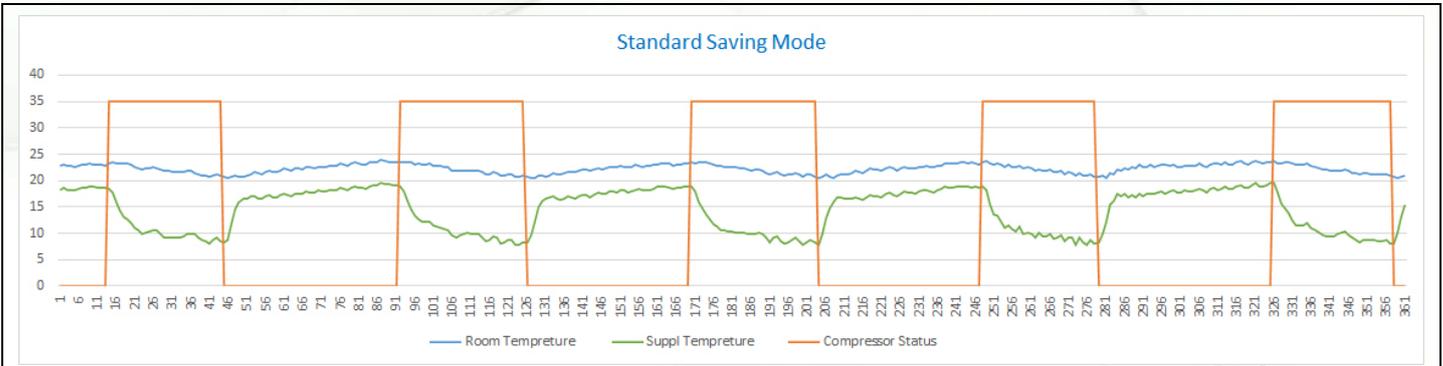
$0.18 \text{ kWh} / 1.43 \text{ kWh} = 0.1258$ or **12.58 % AC Energy Saving**

- (Smart Mode) Therefore: $1.43 - 1.11 = 0.32$ kWh AC Energy Saving

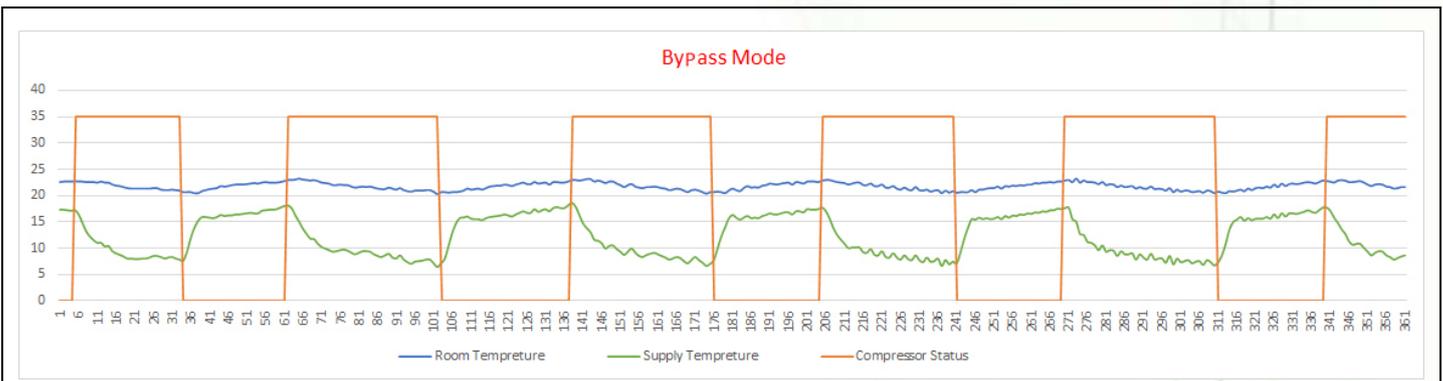
$0.32 \text{ kWh} / 1.43 \text{ kWh} = 0.2237$ or **22.37 % AC Energy Saving**



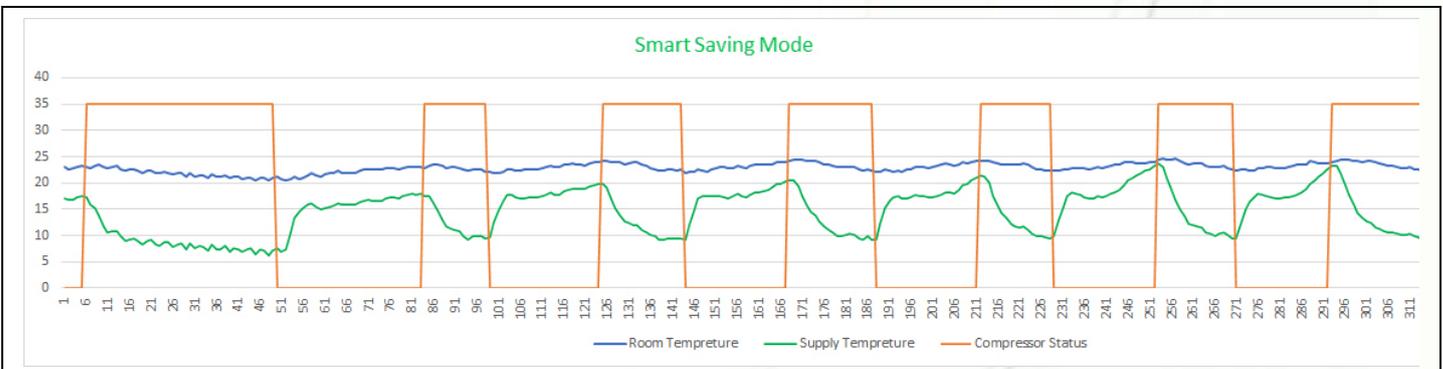
Data Logger Charts



Set Point	Compressor Running Duration (Minutes)	Compressor Off Duration (Minutes)	Min Supply Temp.	Average Supply Temp.	Minimum Room Temp.	Maximum Room Temp.	Average Room Temp.	Outside Temp.
23	26	34	7.8 C°	14.4 C°	20.6 C°	23.9 C°	22.3 C°	38 C°



Set Point	Compressor Running Duration (Minutes)	Compressor Off Duration (Minutes)	Min Supply Temp.	Average Supply Temp.	Minimum Room Temp.	Maximum Room Temp.	Average Room Temp.	Outside Temp.
23	34.3	25.7	6.8 C°	12.3 C°	20.3 C°	23 C°	21.8 C°	38 C°



Set Point	Compressor Running Duration (Minutes)	Compressor Off Duration (Minutes)	Min Supply Temp.	Average Supply Temp.	Minimum Room Temp.	Maximum Room Temp.	Average Room Temp.	Outside Temp.
23	27.8	32.2	6.3 C°	14.7 C°	20.4 C°	24.1 C°	22.9 C°	38 C°



Summary

The standard saving mode is collecting data from supply air temperature sensor and compressor status only to calculate the best time to switch on/off the compressor, consider the aircon is on lowest set point.

The smart saving mode is collecting data from supply air temperature, return air temperature and compressor status to know the setpoint temperature to calculate the best time to switch on/off the compressor.

The **AMI V1** Smart Aircon Energy Saver evaluation was carried out in May; The **AMI V1** showed good energy savings especially in the summer weather when the AC Split Unit has larger kWh loads and we take the samples between **14:00 to 15:00**.



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