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گلیران
تهویه

MULTI V™ IV

مقایسه فنی و اقتصادی مولتی وی و چیلر هوایی

Air Conditioning & Energy Solution Company

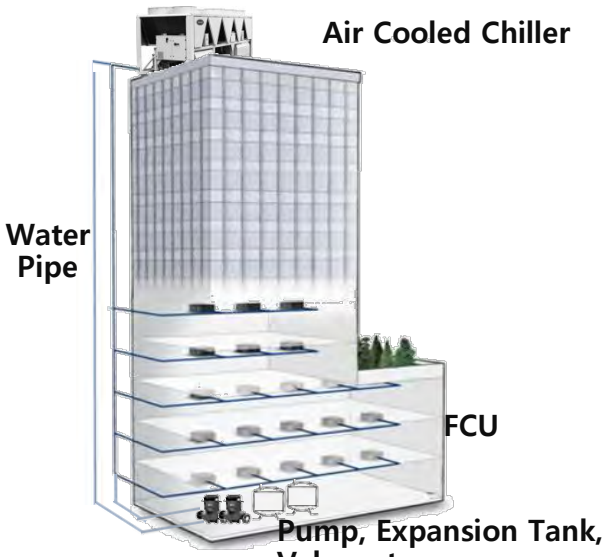
مقایسه فنی و اقتصادی مولتی وی و چیلر هوایی

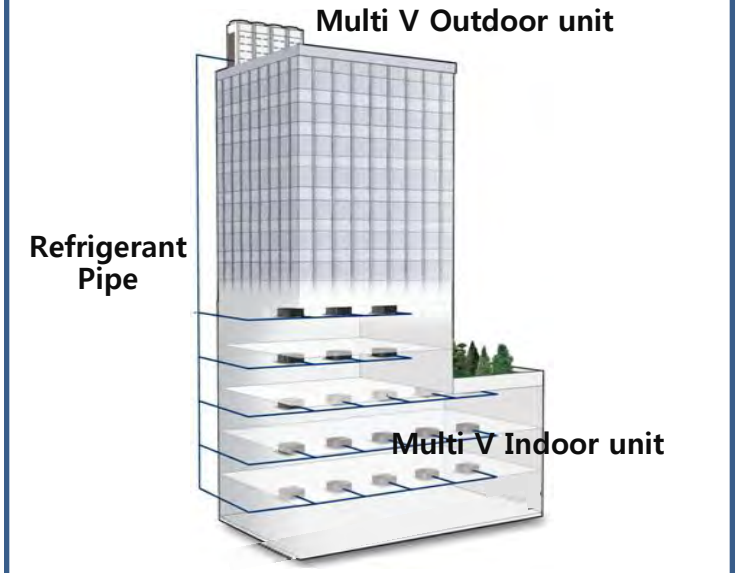
System Summary

Air Cooled Chiller system

MULTI V IV HEAT PUMP

System Diagram





System Component

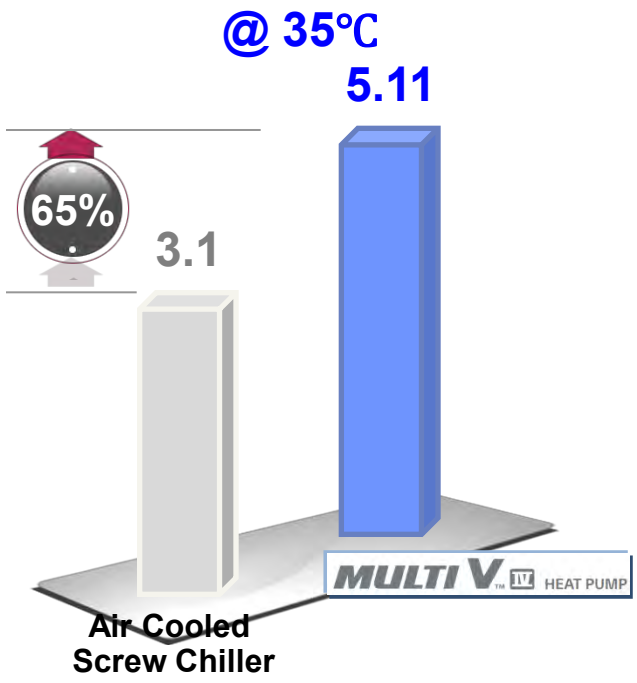
- **Air Cooled Chiller**
- **FCU, AHU**
- **Chilled Water Pipe**
- **Water Pump, Expansion Tank, Water Treatment system, Valve, Sensor**

- **Multi V Outdoor unit**
- **Multi V Indoor unit** (or AHU)
- **Refrigerant pipe**

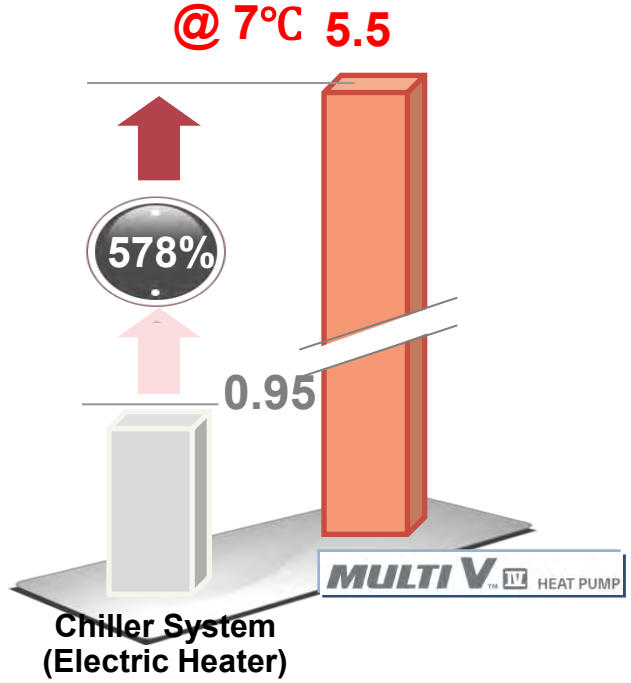
Efficiency _ High EER

Multi V produce efficiency is higher than chiller by 39% at cooling mode

Cooling EER



Heating EER



Mode	Cooling			Heating		
Out Temp.	35 ℃			7 ℃		
Type	Capacity(KW)	P/I(KW)	EER(KW)	Capacity (KW)	P/I(KW)	EER(KW)
Chiller (30XA252)	268	87	3.08	25	26.25	0.95
Multi V IV (ARUN80LTE4)	22.4	4.38	5.11	25.2	4.58	5.5
			65%			578%

Stand by unit - Auto back up system

A stand-by unit is not required in Multi V system

In case building cooling load is 1,000 ton

Air Cooled Chiller system

400ton x 3unit → For Operating

400ton x 1 unit → For Stand by

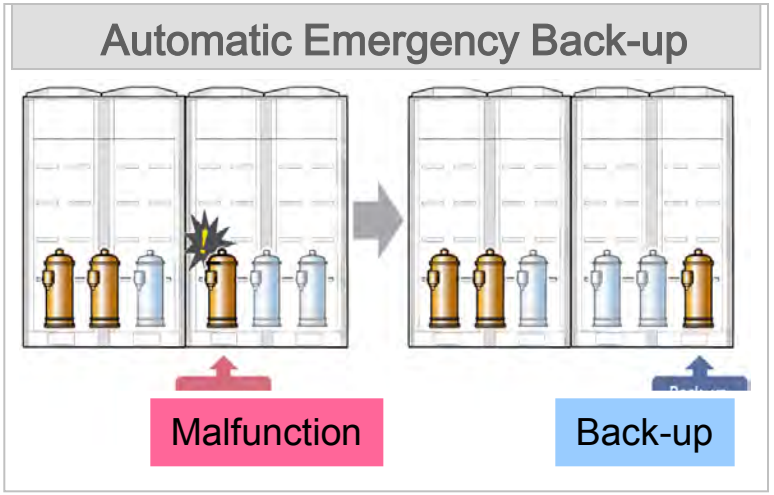
→ Total 1600ton

Multi V IV System (VRF)

Multi V Capacity

→ 1200ton

(Calculated under design condition)



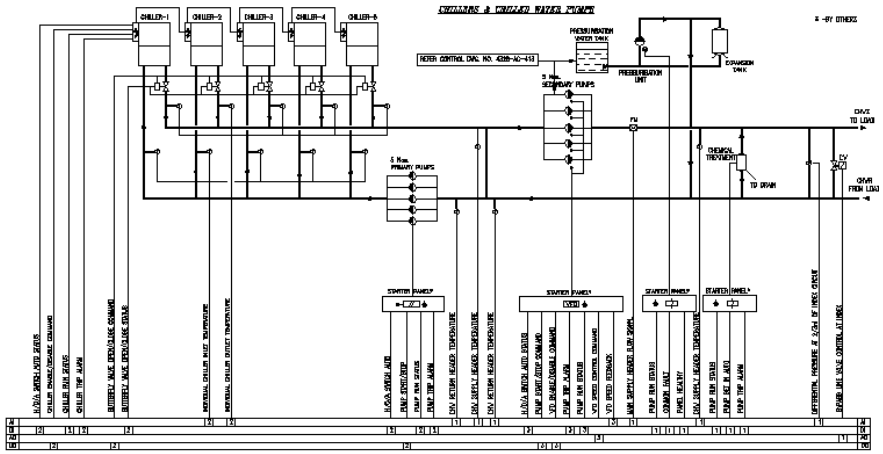
→ Multi V system can reduce initial Cost

Control system

Multi V IV → Simple Control system

Air Cooled Chiller system

As DDC system has many connections,
its management is relatively difficult.

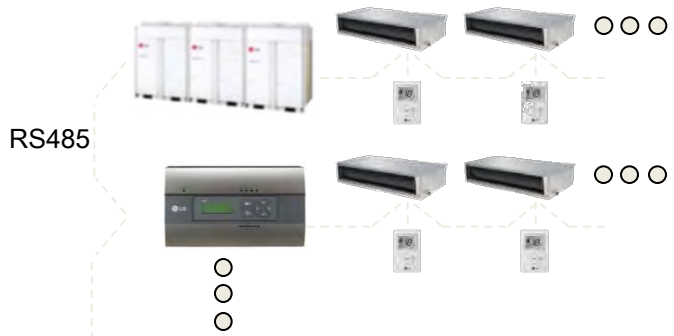


BMS
WORKSTATION

ACTIVE DATA SWITCH

Multi V IV System (VRF)

Multi V doesn't need DDC. Only
communication line and gateway are needed.



**BAC net or Lone work G/W
(Indoor units 256)**

BMS
WORKSTATION

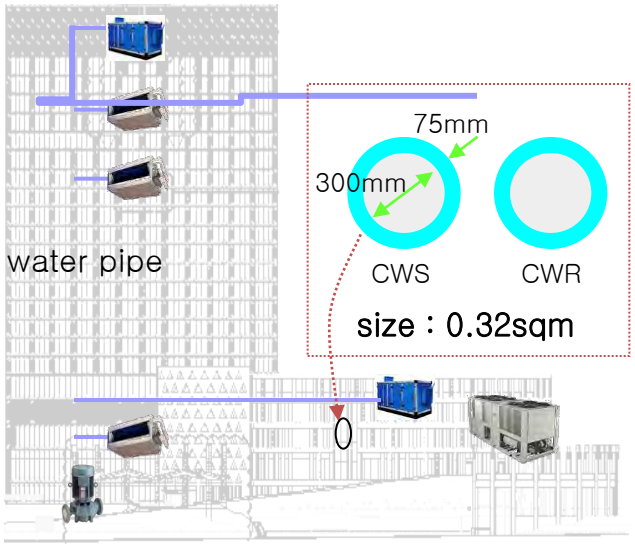
ACTIVE DATA SWITCH

Shaft size – pipe size

Multi V system can reduce a shaft size of building

Air Cooled Chiller system

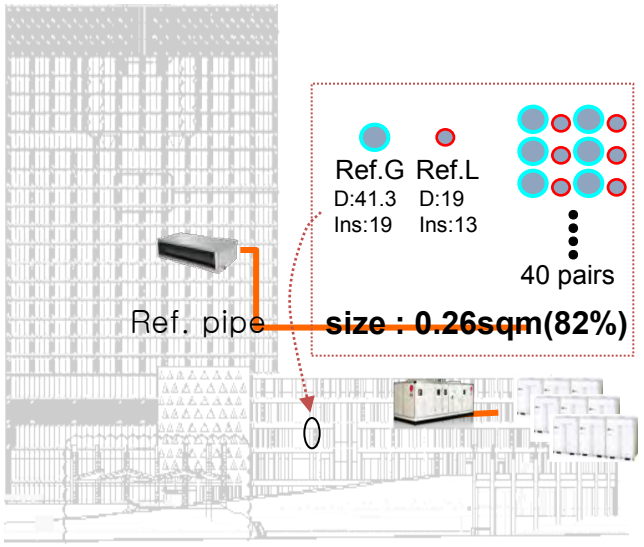
Long single piping from chiller, pump, to FCU.



- Big (diameter 300mm) & long pipe.
- Hard to work
- Leakage test is difficult because of single long pipe.

Multi V IV System (VRF)

Indoors are directly connected to Multi V outdoor units.



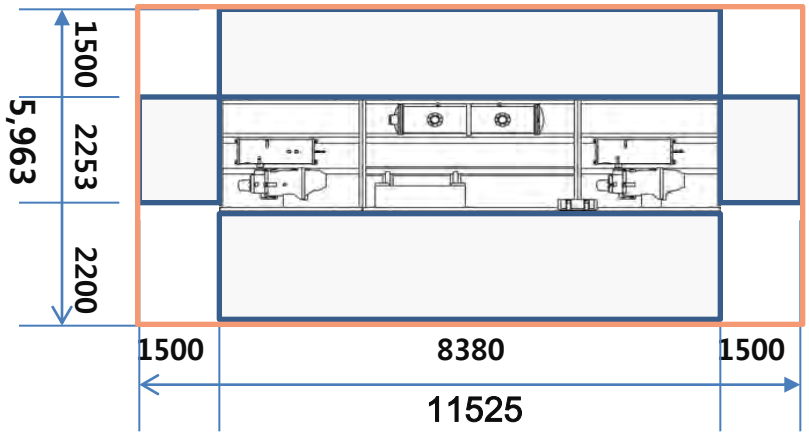
- Easy work with small and flexible pipe.
- Easy expansion of equipment.
- Leakage test with high pressure nitrogen gas (38kgf/sqm) per each system is possible.
- It can guarantee the installation quality.

Space Benefit

Foot print

SVC/ Maintenance & Heat exchange area

Air Cooled Chiller system

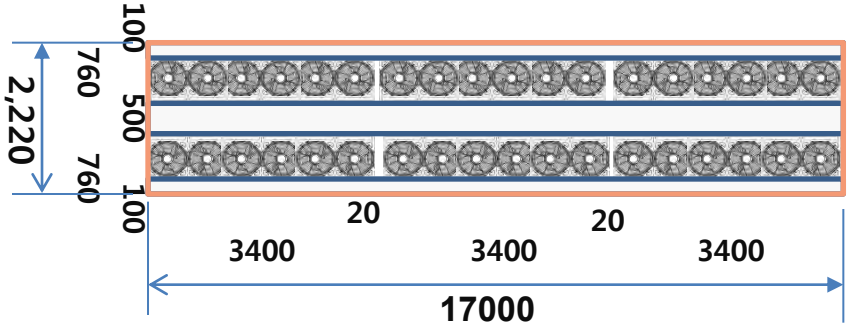


400ton Chiller " C Company "

5.96m x 11.52= 68.65㎡

100%

Multi V IV System (VRF)



400ton Multi V IV (48HP x 10units)

2.22m x 17= 37.74㎡

55%

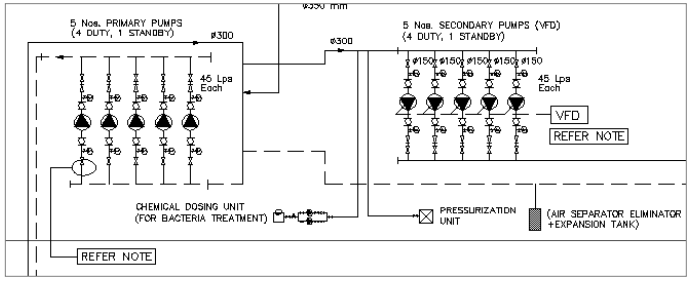
Foot print reduce by 45%

Space Benefit

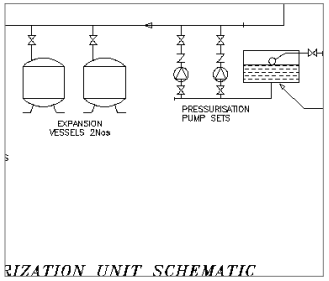
Multi V system is no need for a machine room.
Multi V doesn't require any extra devices like pump, water tank, chemical dosing unit, valves.

Air Cooled Chiller system

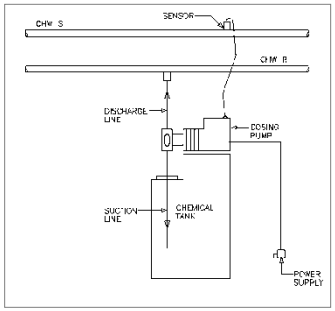
Many kinds of devices are required.



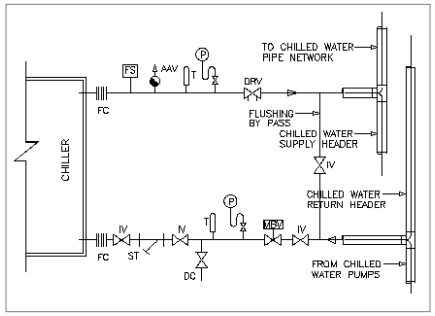
Many pumps



Pressurization unit



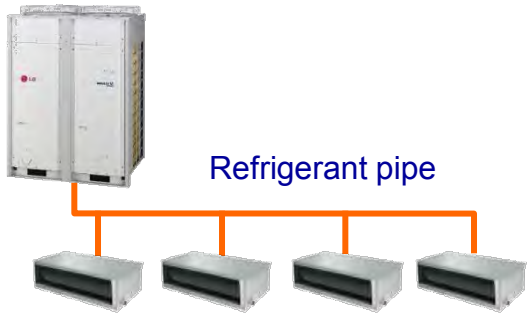
Automatic chemical dosing unit



Valve, flexible for chiller connection

Multi V IV System (VRF)

Design, installation, operating and service, maintenance is simple and easy.
Expansibility of more unit is too.



→ No need Machine Room

→ Simple System

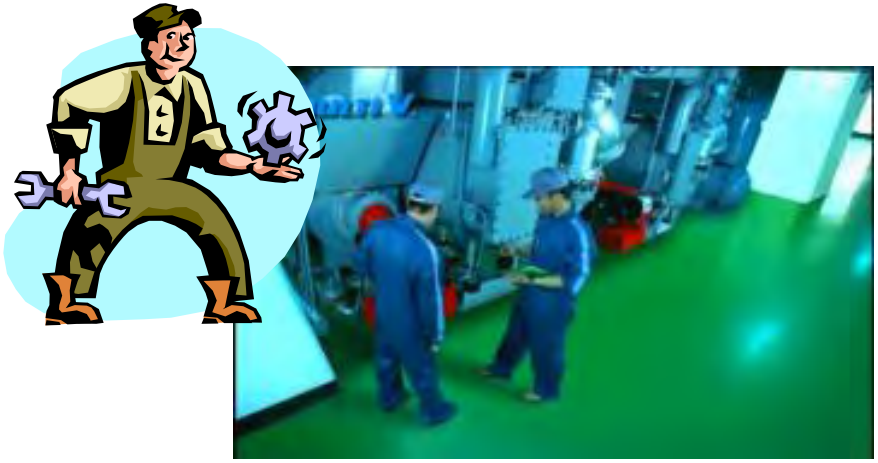
Maintenance

(For Chiller) Certified maintenance and operating staff is needed

Air Cooled Chiller system

The system requires certified maintenance and operating staff not only for chillers but also pumps, boilers, cooling towers etc.

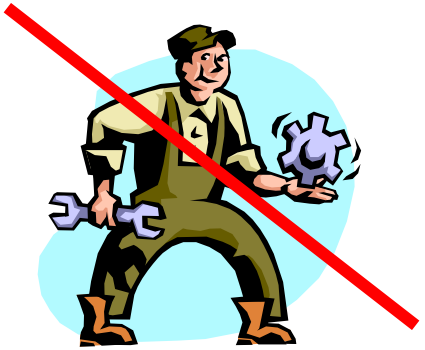
→ More expensive maintenance cost.



→ Maintenance Staff is required

Multi V IV System (VRF)

No need special maintenance staff.
Economic and easy maintenance



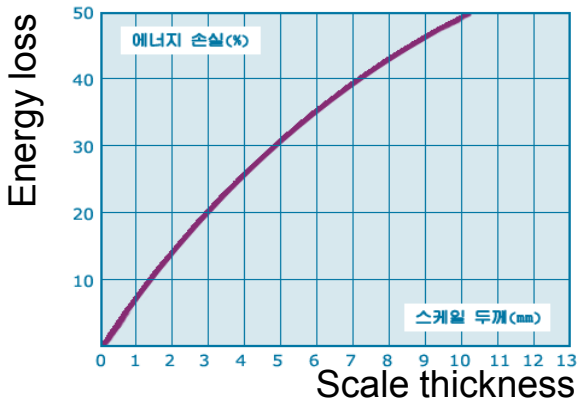
→ No need Maintenance Staff

Maintenance

Continuance of System capacity

Air Cooled Chiller system

- **Needs to clean Water Pipe in FCU**
  System capacity dropping by Water scale and rust, and causes virus appearance



< Energy loss per scale thickness >

2~3 years　　5~6 years　　7~8 years

Multi V IV System (VRF)

- **No Water Pipe : No scale**

< All refrigerant Pipe >

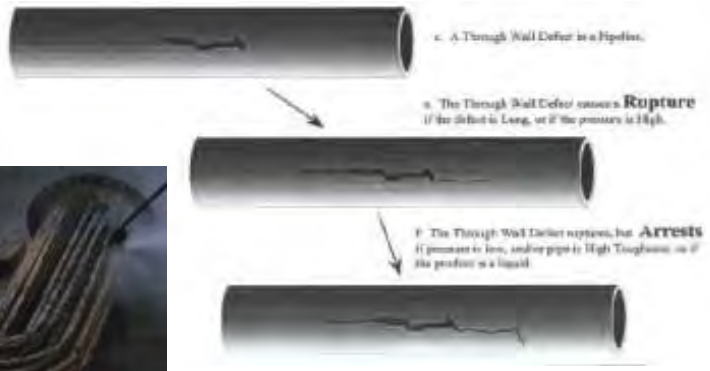
Maintenance

Continuance of System capacity

Air Cooled Chiller system

- **Capacity dropping & Danger of Leakage**

  By using Anti-Freezing liquid, corruption increasing in Pipe



Multi V IV System (VRF)

- **No Corruption in Refrigerant Pipe**

< Copper Pipe for connection between IDU and ODU>

Maintenance

Continuance of System capacity

Air Cooled Chiller system

- **Danger of Water Pipe Freezing in cold day**

  All Water in Thermal Storage, and Pipes in winter season to protect Freezing problem

< Worry of Water Freezing >

Multi V IV System (VRF)

- **No worry**

< No worry for refrigerant Pipe >

Commissioning

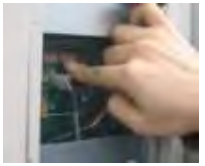
Simple Commissioning

Air Cooled Chiller system

1. 3rd party TAB (Water balance, Air balance)
 * TAB (Testing, Adjusting, Balancing)
2. Commissioning for each machine.
3. Matching commission between all machine
 (Pump, Chiller, AHU, FCU, BMS, etc)

1 week

Multi V IV System (VRF)



1. PC Connect to Outdoor unit.
2. Running the LGMV Program.
 * LGMV (Testing and checking program)

→ Making Report

2 hours

SVC

Official After SVC network and 1 contact points
vs hard to find reason and many contact points

Air Cooled Chiller system

Chinese products

Chinese products

GRUNDFOS

wilo

AERMEC

Carrier

Multi V IV System (VRF)

LG

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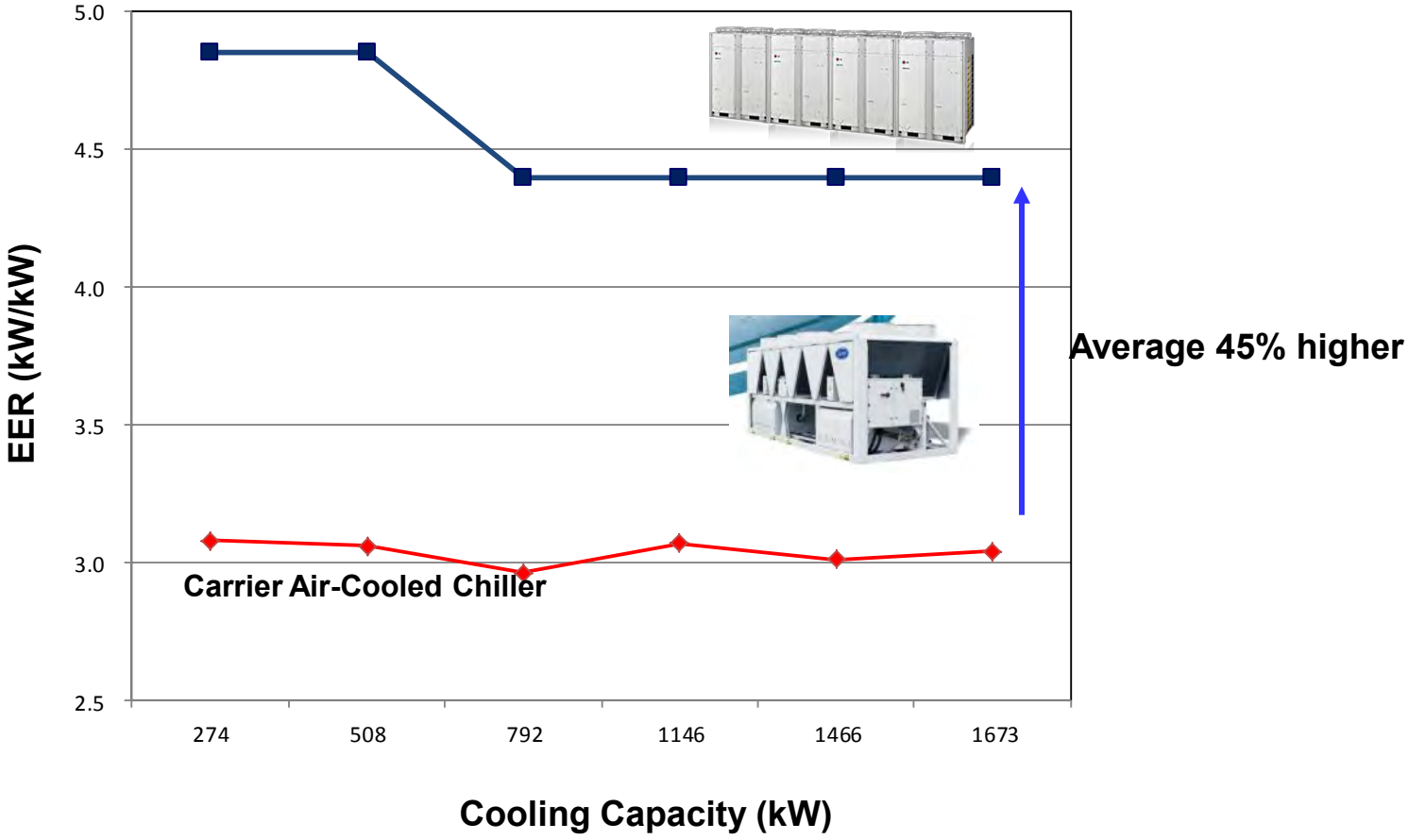
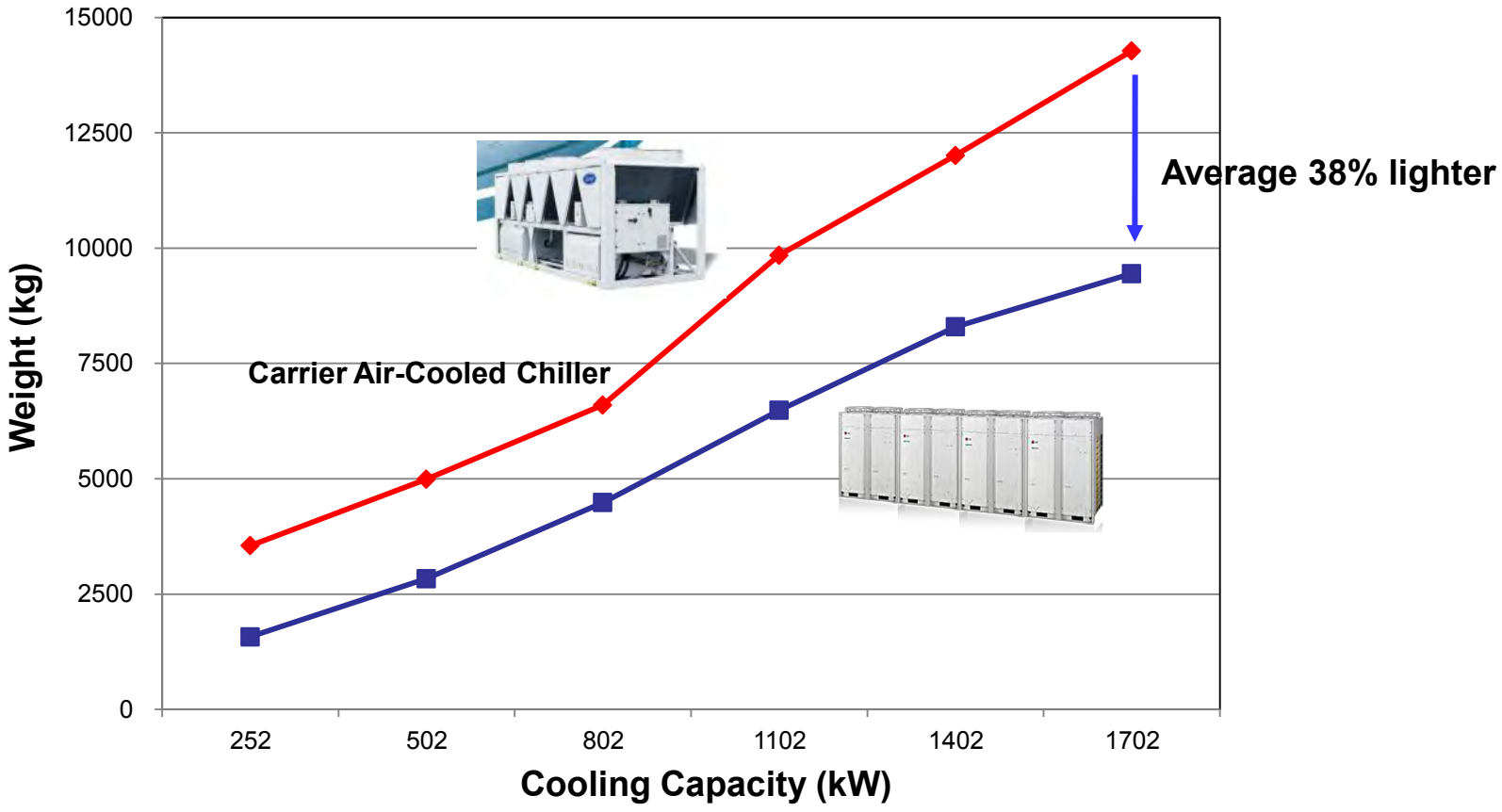
Mechanical comparison _ EER

EER of Multi V IV is average 42% higher than Carrier air-cooled chiller.



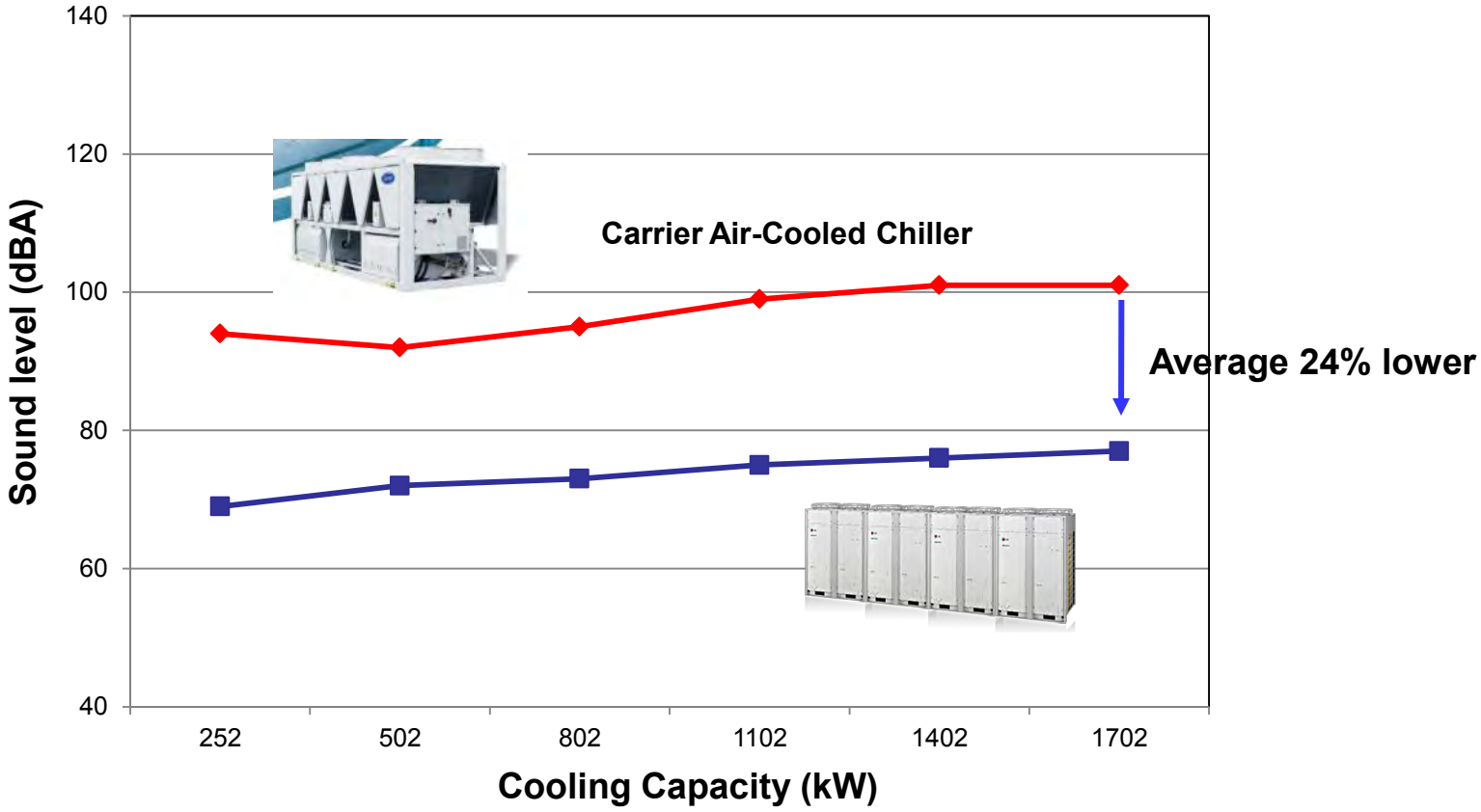
Mechanical comparison _ Weight

Weight of Multi V IV is average 38% lighter than Carrier air-cooled chiller.



Mechanical comparison _ Sound level

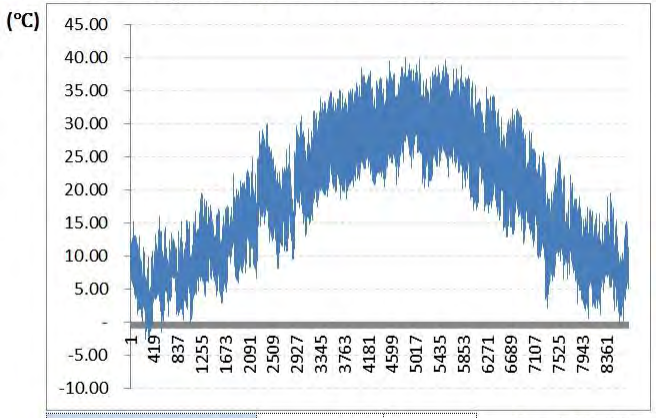
Sound level of Multi V IV is average 24% lower than Carrier air-cooled chiller.



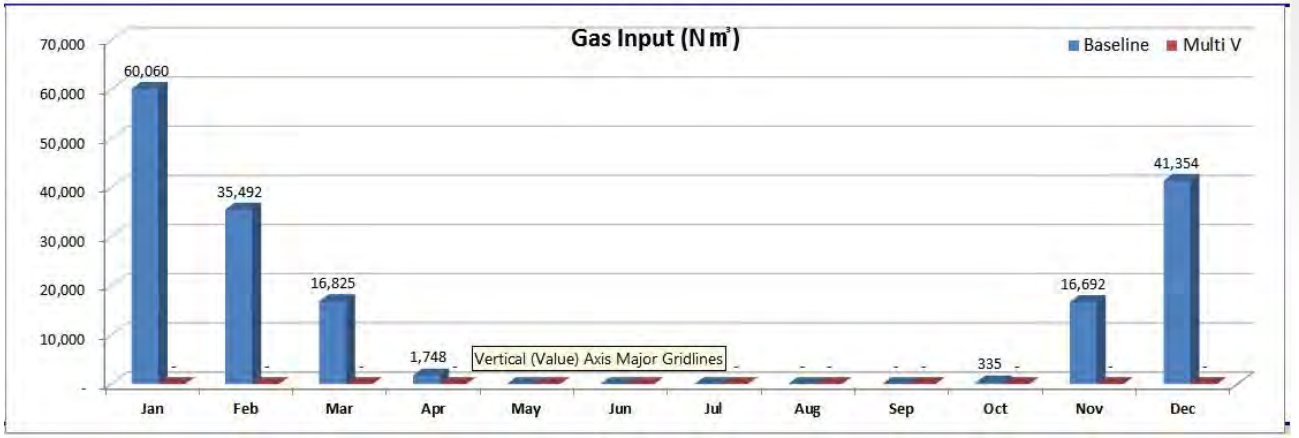
آنالیز انرژی

محاسبه مصرف انرژی برق و گاز مصرفی مطابق با شرایط پروژه:

■ Weather data preview (Outdoor Air Temperature (DB))

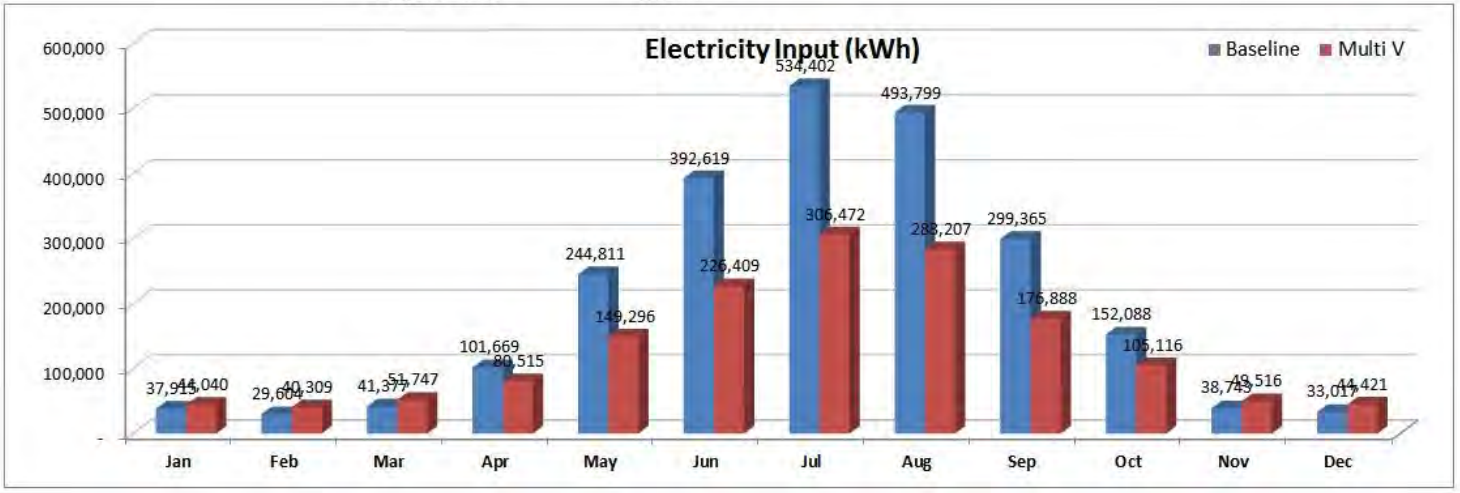


Max Temperature (℃)	39.9	℃
Average Temperature (℃)	19.0	℃
Min Temperature (℃)	-2.9	℃

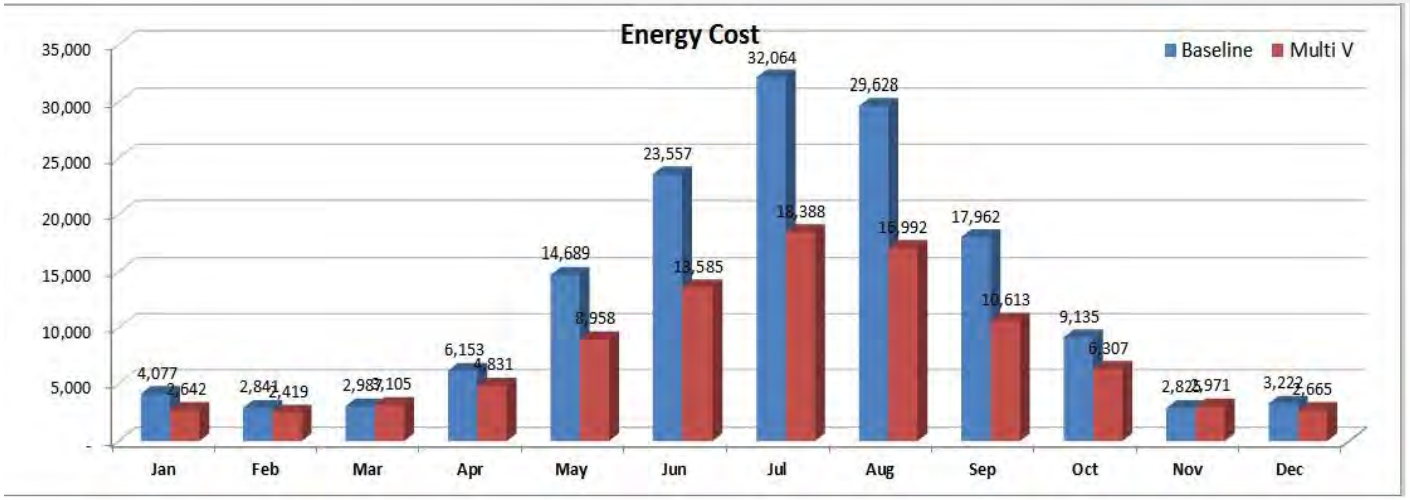


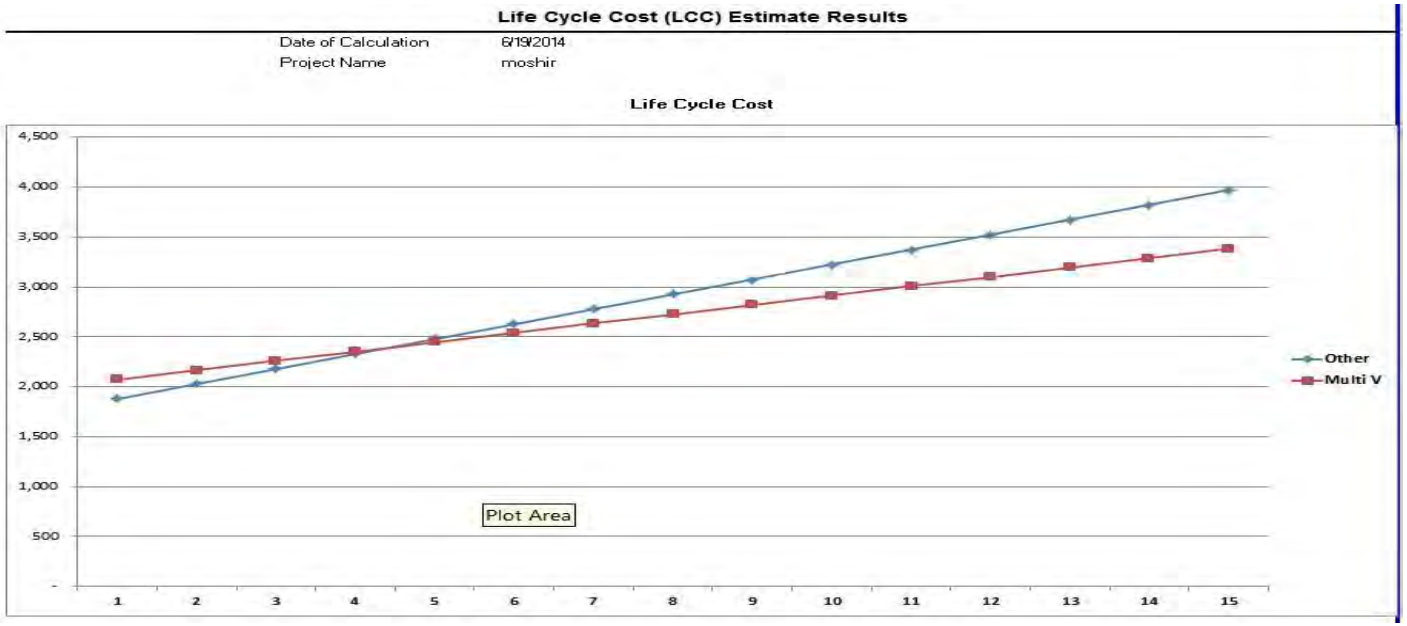
Monthly Electrical Usage Estimate Results

Date of Calculation	6/19/2014
Project Name	moshir



نمودار هزینه انرژی و بازگشت سرمایه :





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