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VRF Evolution

2016

SMMS-e (High Ambient)

High capacity inverter control, High energy efficiency





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Unit Capacity Expansion

Up to 22HP in single outdoor unit

Existing chassis		New chassis
8 - 10 - 12 - 14 HP	14 - 16 - 18 HP	18 - 20 - 22 HP
		

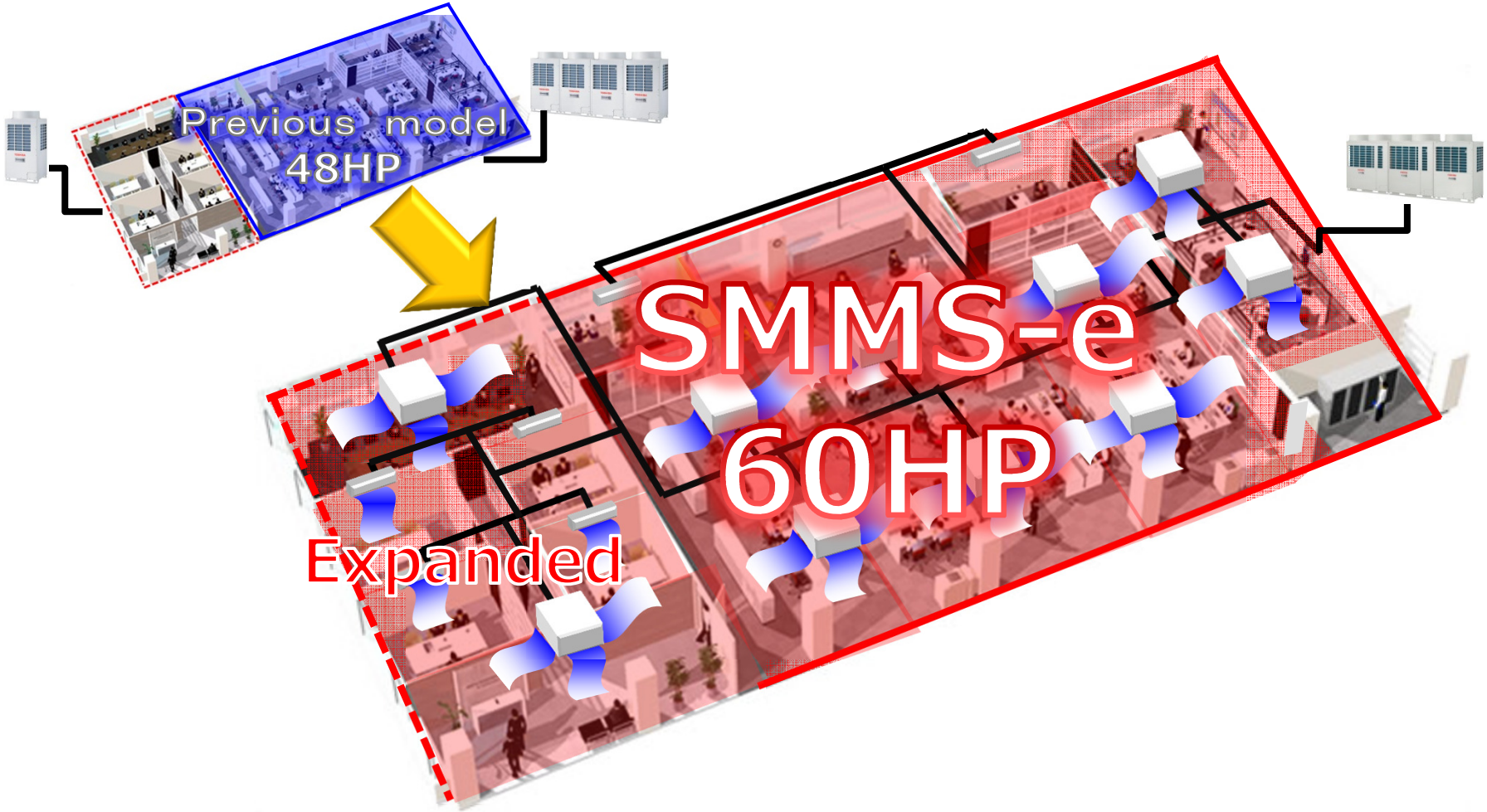
14 & 18HP has 2 models: "Space saving" or "High Eff"

SMMS-e can produce up to 22HP on a single module platform, due to the newly developed chassis for larger capacity units

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System Capacity Expansion

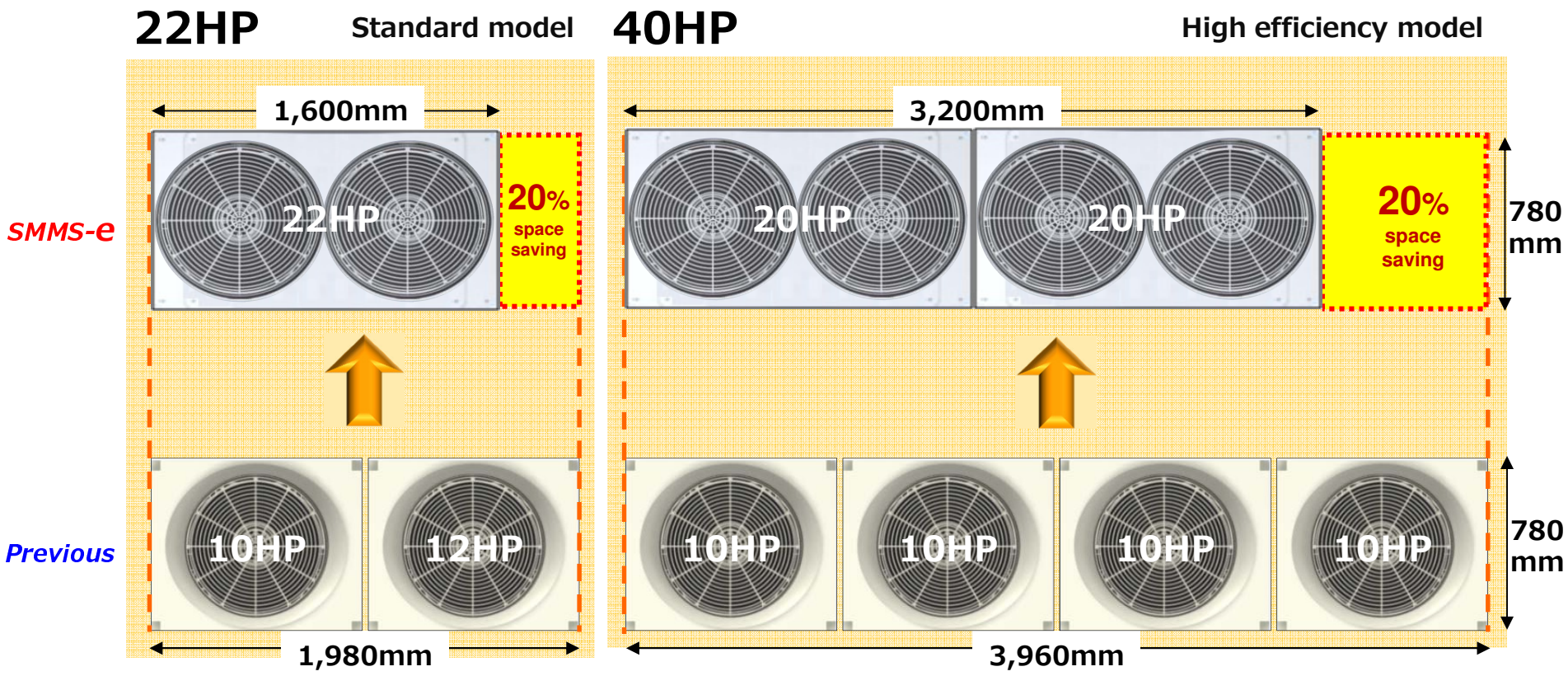


With the new SMMS-e, it is now possible to connect up to 60HP in 1 system, with max. 64 connectable indoor units

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Installation Flexibility



Reduced foot print and time of delivery / installation thanks to the new compact unit design

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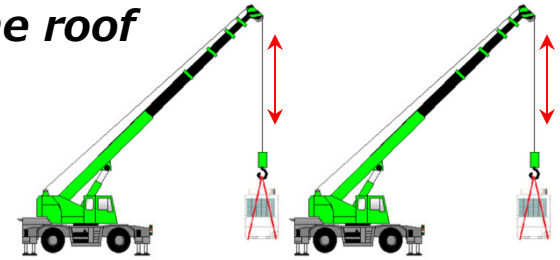
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Installation Flexibility

Previous

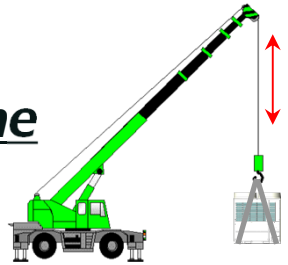
Lifting to the roof

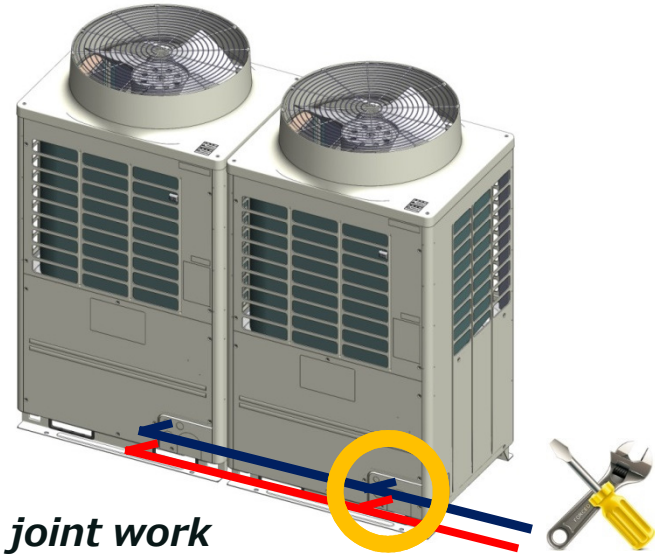
2 times



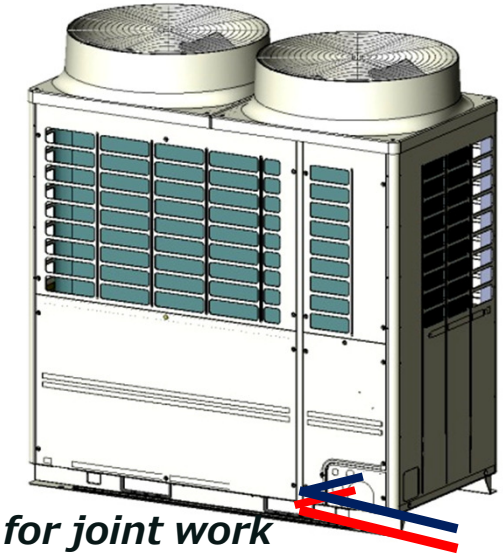
SMMS-e

1 time





Requires joint work



No need for joint work

SMMS-e with 22HP in a single module, reduces pipework and overall installation time

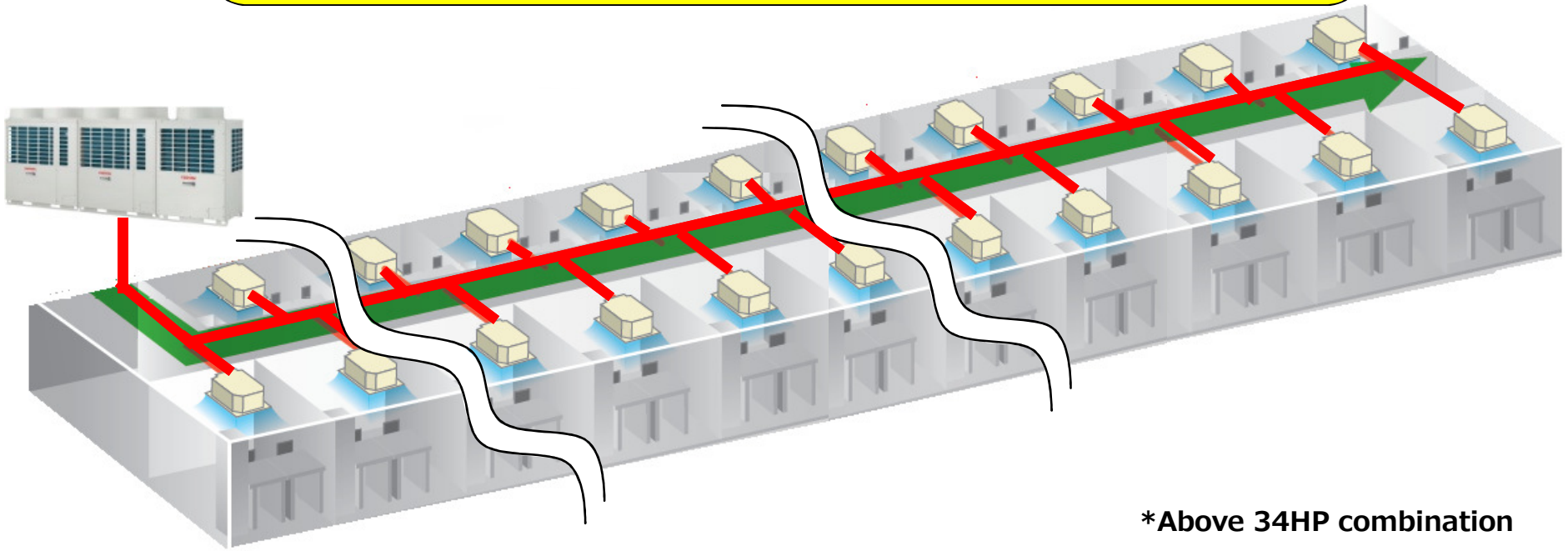
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Total Piping Length

Previous model **SMMS-e max total length**

500m ⇨ 1000m



*Above 34HP combination

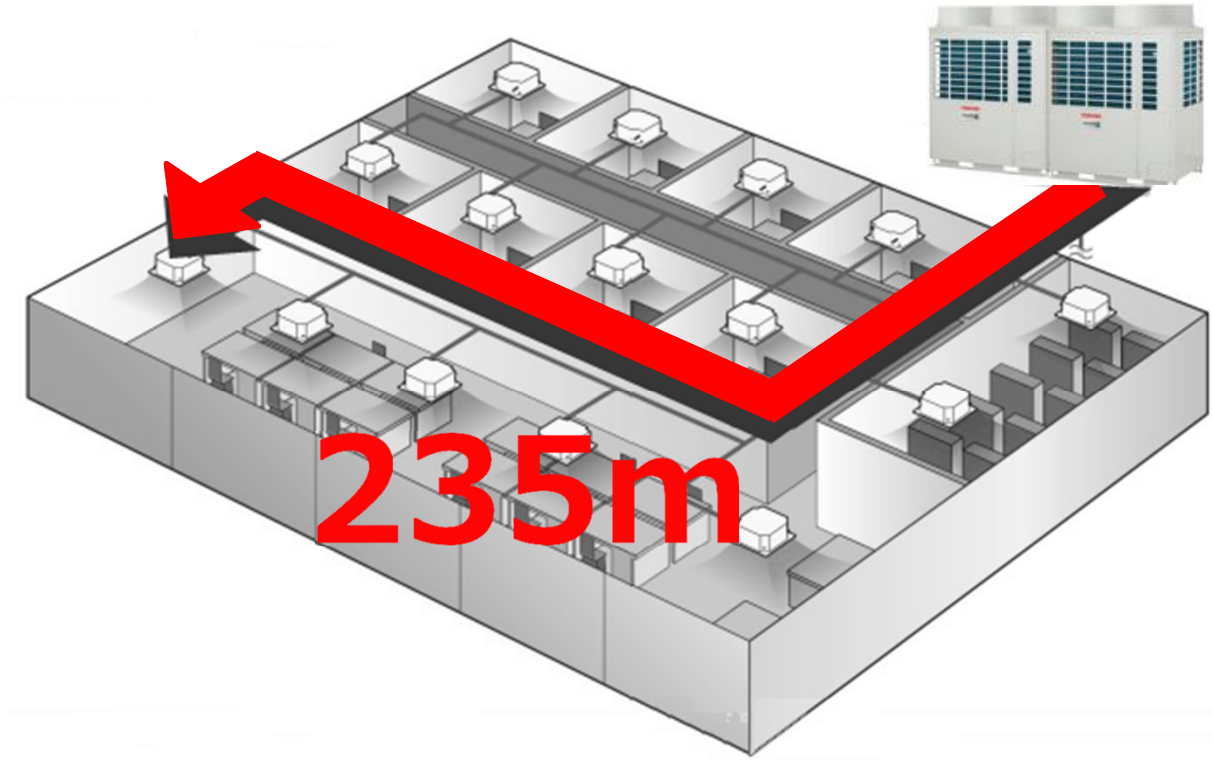
Toshiba SMMS-e allows up to 1000m maximum piping length

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Farthest Equivalent Length

Industry top class!

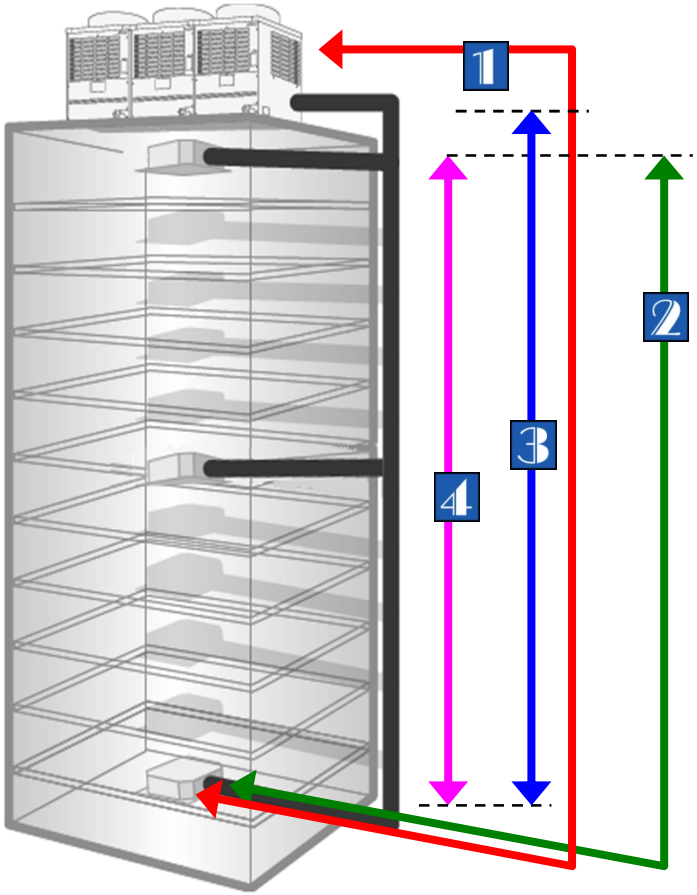


Maximum equivalent distance between outdoor unit and farthest indoor unit is 235 metres

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Piping Capability Summary



Total length	1000m*
1 Farthest equivalent length	235m
2 Farthest pipe from 1st branch	90m**
3 Height between CDU-FCU (outdoor unit above)	70m***
4 Height between FCU-FCU	40m

* : Above 34HP combination
** : 65m if the piping height between CDU and FCU is more than 3m
*** : 50m if the piping height between FCU's is more than 3m

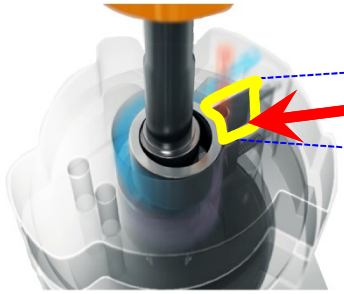
Piping capability provides benefits for the system design, installation flexibility, and installation cost

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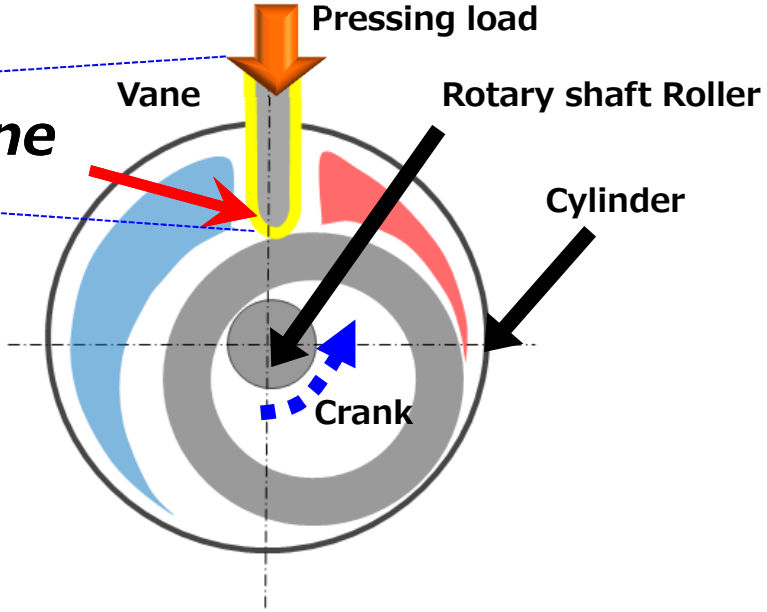
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DLC 2-Stage Vane for Durability

Compression mechanism of rotary compressor



Diamond Like Carbon coated tip



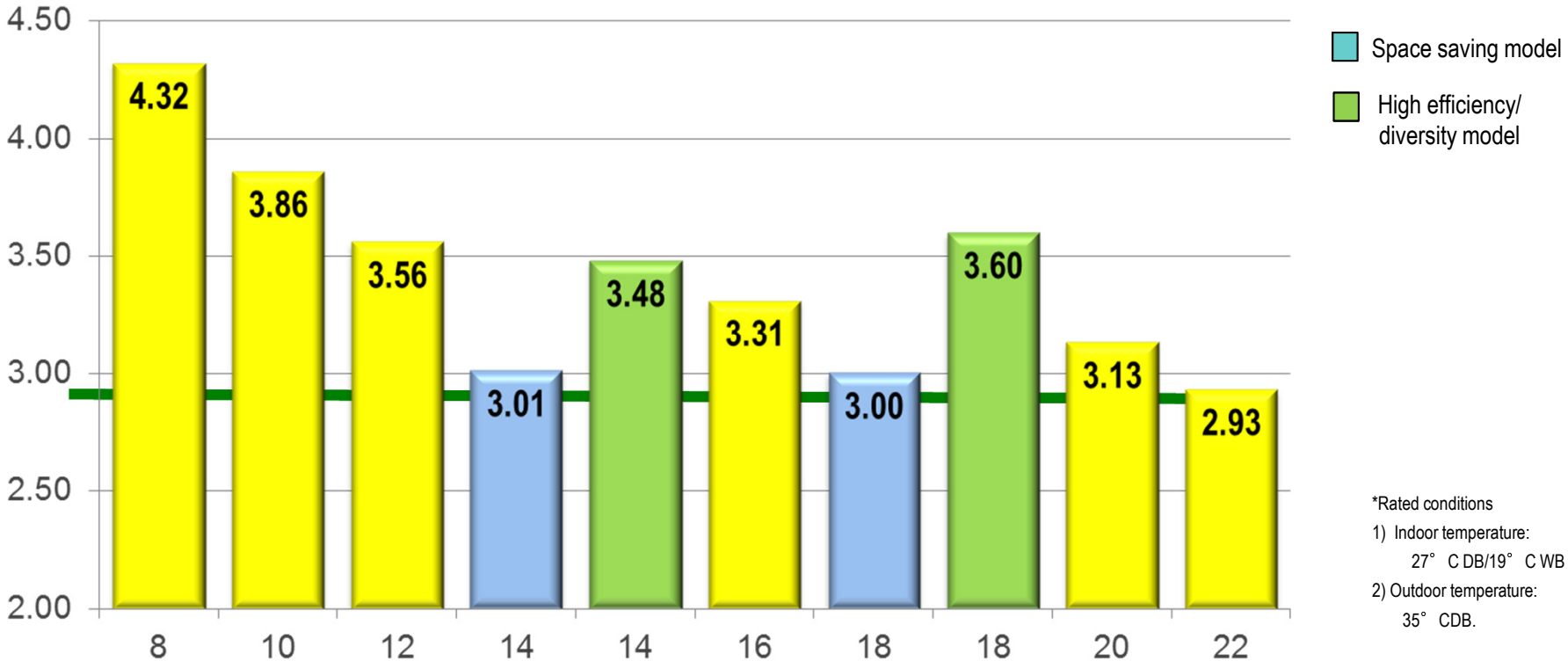
Increased hardness of the DLC coated vane reduces friction and enhances both reliability and performance

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Greater Efficiency Performance

Cooling EER values at 100% load



*Rated conditions
1) Indoor temperature:
27° C DB/19° C WB
2) Outdoor temperature:
35° CDB.

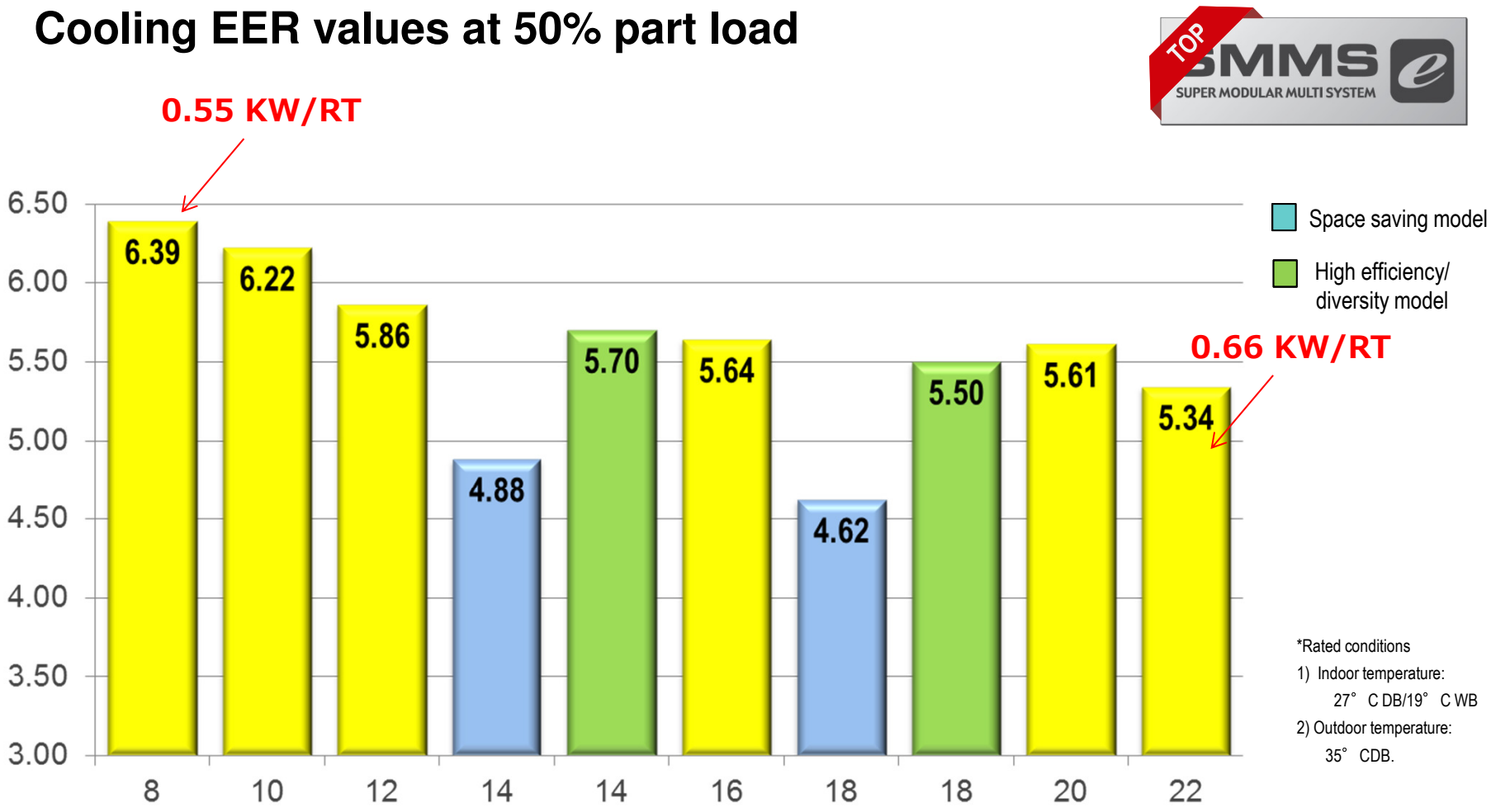
New SMMS-e outdoor unit range has great performance
All outdoor units except 22HP have cooling EER 3.0 or higher

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Greater Efficiency Performance

Cooling EER values at 50% part load



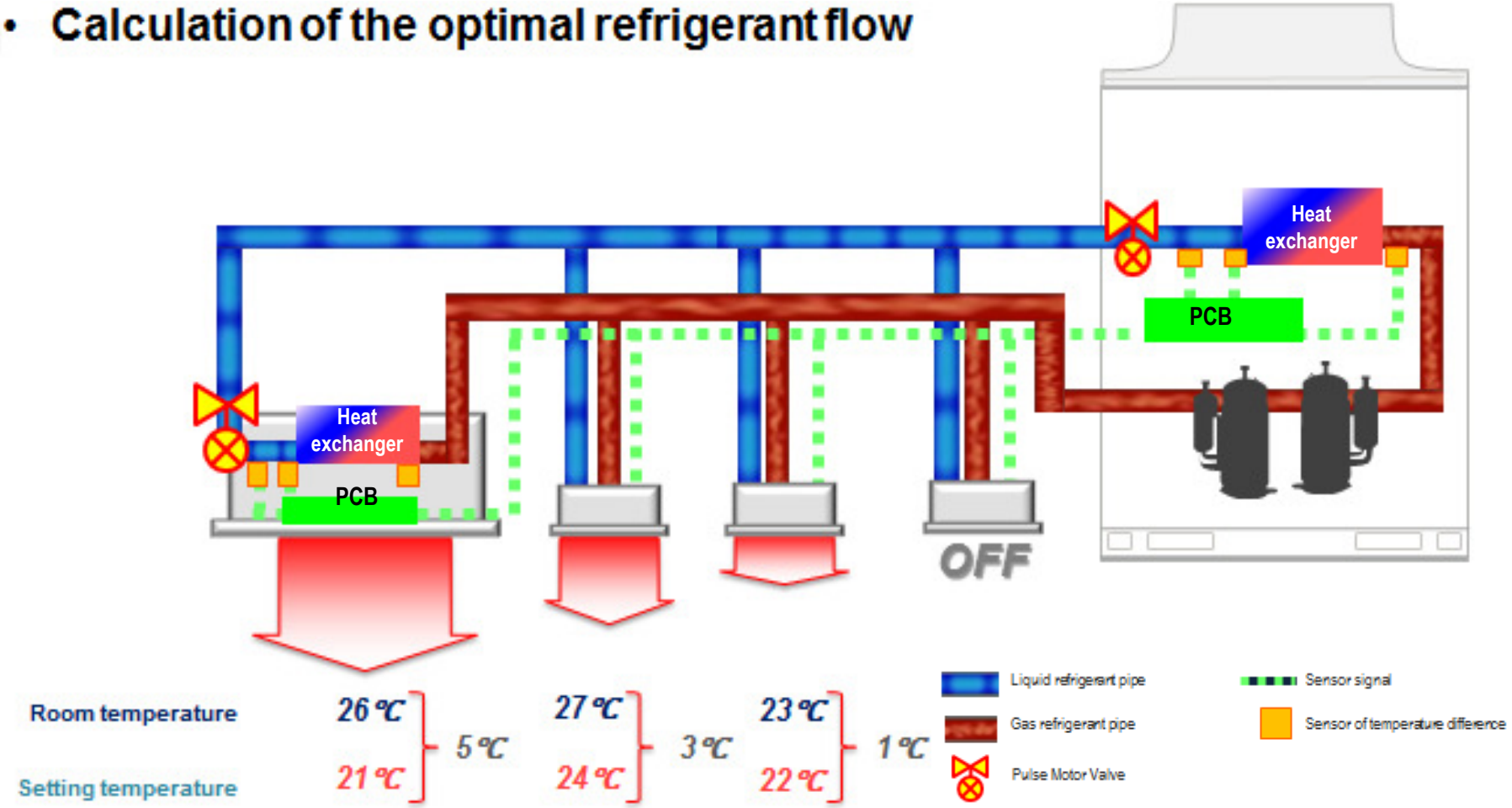
Higher EER values at lower part load percent
Here's the cooling EER values at 50% load

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Intelligent VRF Control

• Calculation of the optimal refrigerant flow



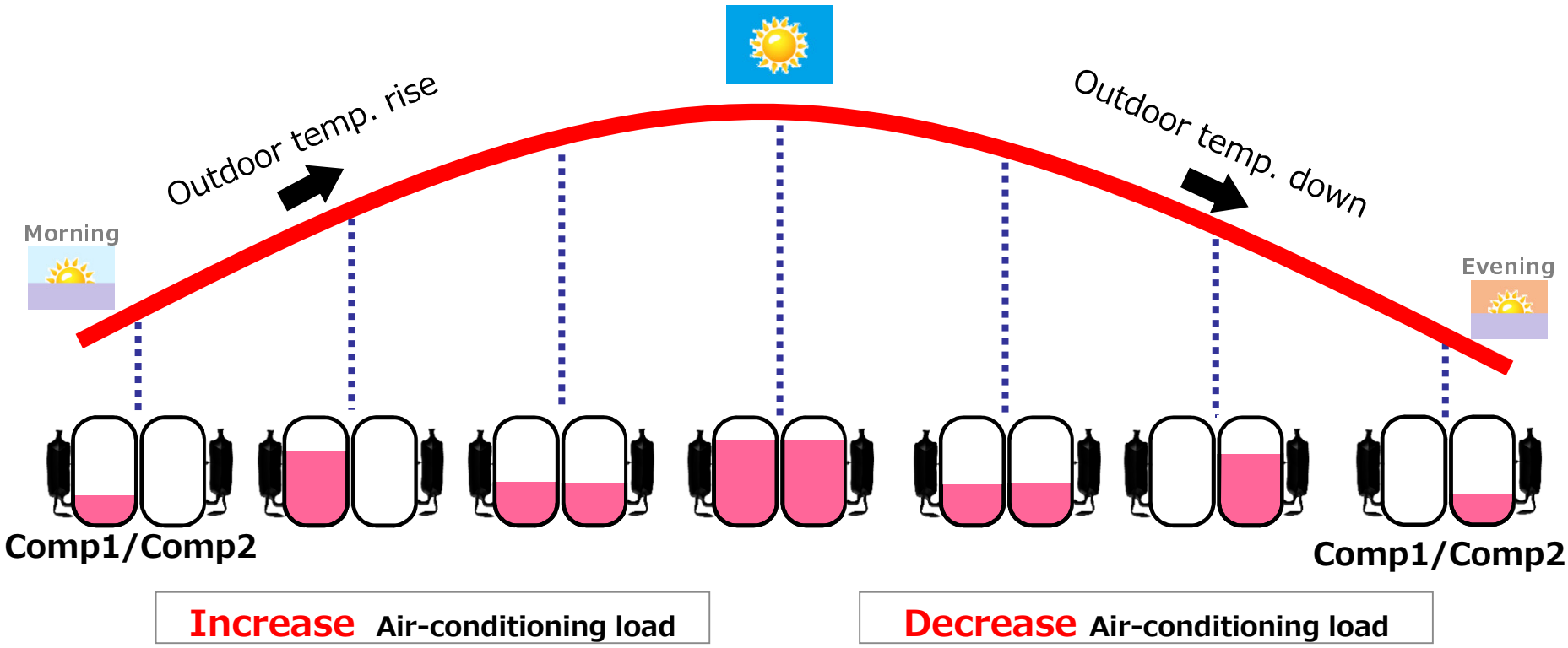
- For every indoor unit the system detect the difference between the two temperature sensors and regulate the refrigerant flow to reach and maintain the desired level of comfort.

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Rotational Control

Efficiency of compressor is best between 30% & 80% load

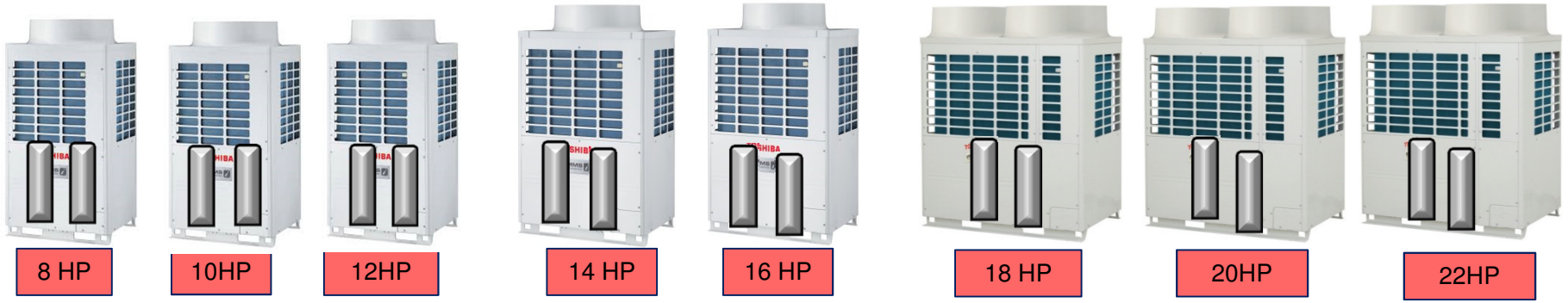


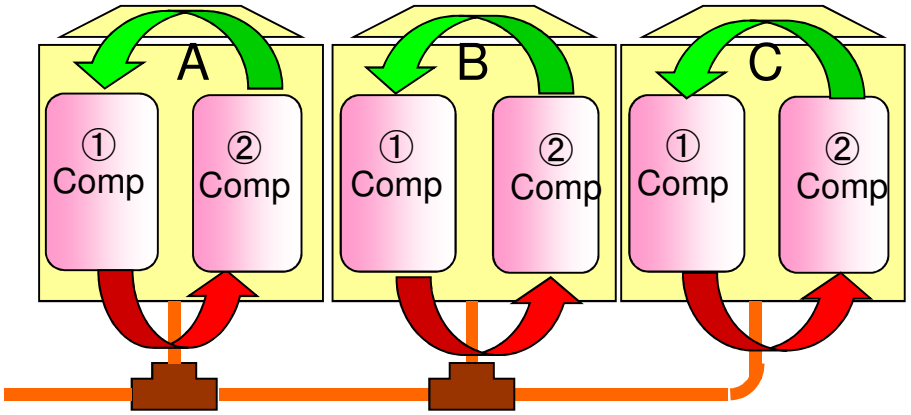
SMMS-e controls the operation of each compressor to ensure equal run time for better reliability

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Standby operation always





2 compressors in each SMMS-e outdoor unit, ensured 50% operational capability at all time, in the event if 1 compressor fails

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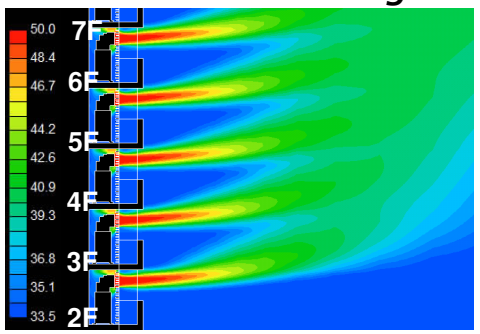
Condenser Fan Static Pressure



60Pa



Air flow simulation diagram



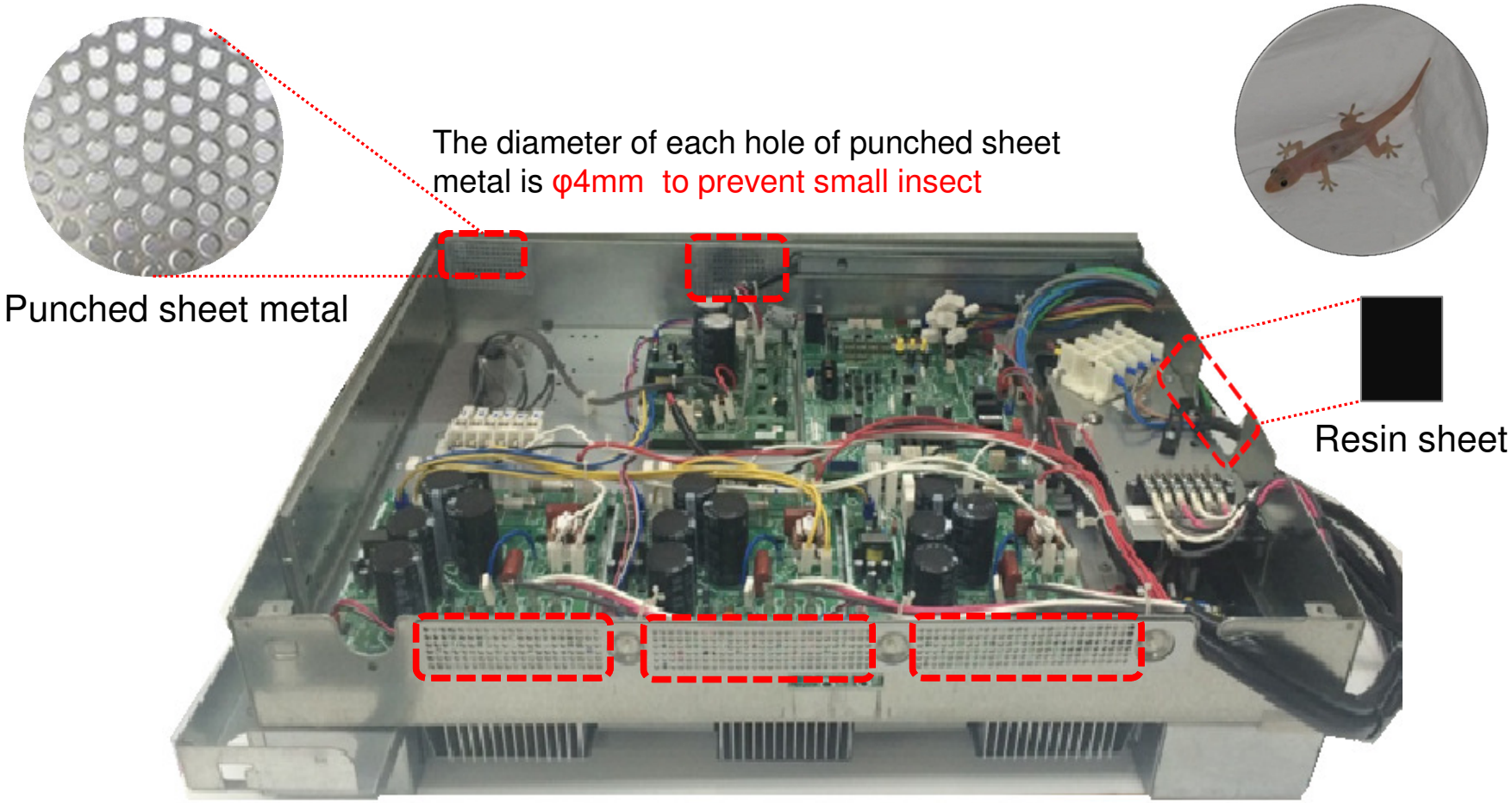
Note : This result is analytical simulation, that does not gurrantee actual temperatures.

SMMS-e offers higher external static pressure condenser fan to meet installation requirements

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Protection on PCB board



Adopting new Inverter box with of punched sheet metal prevents small animals entry and interference with the electronic components in your air conditioning system.

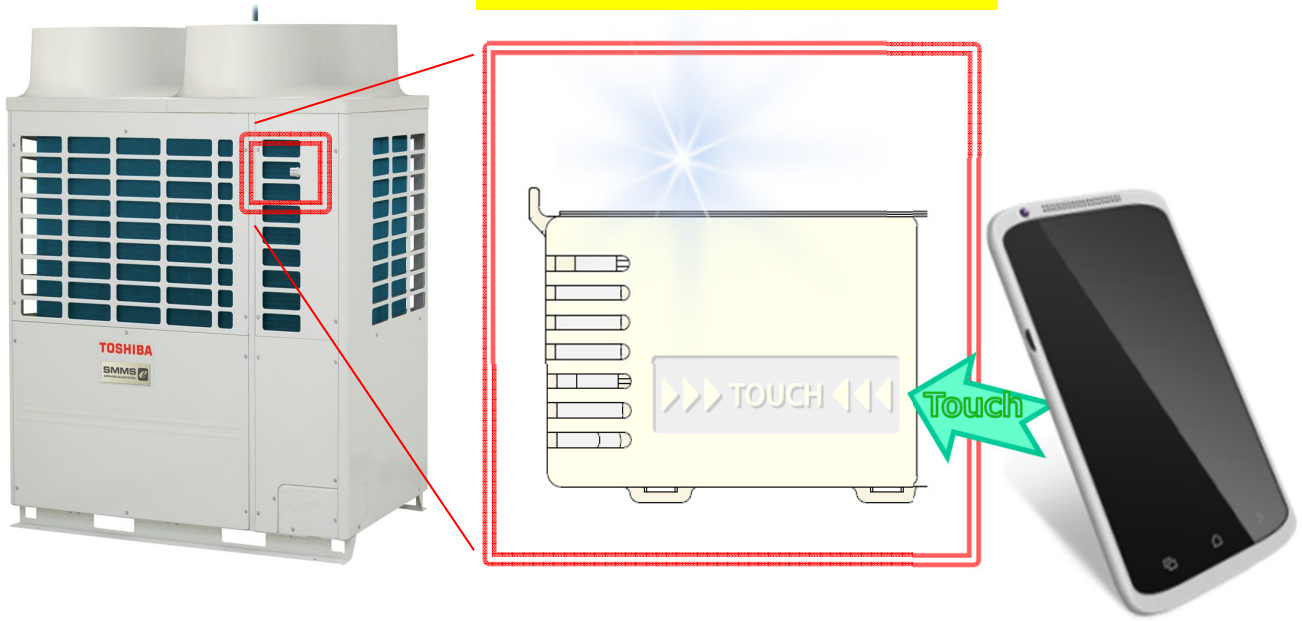
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SMMS-e New Wave Tool

New wireless commissioning and operation data checking system

Industry first!



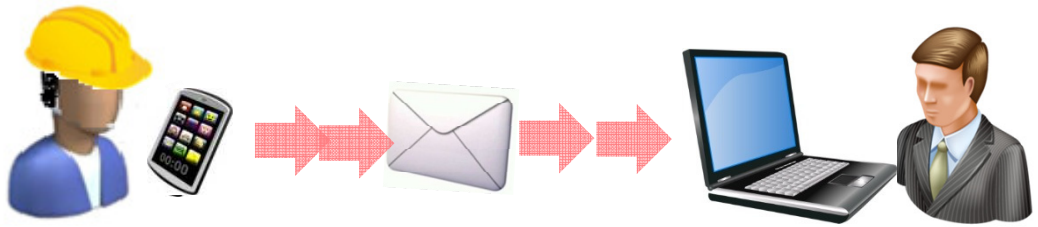
NO NEED FOR -

- Additional PC & cable
- Additional time & work





Near Field Communication
CERTIFIED



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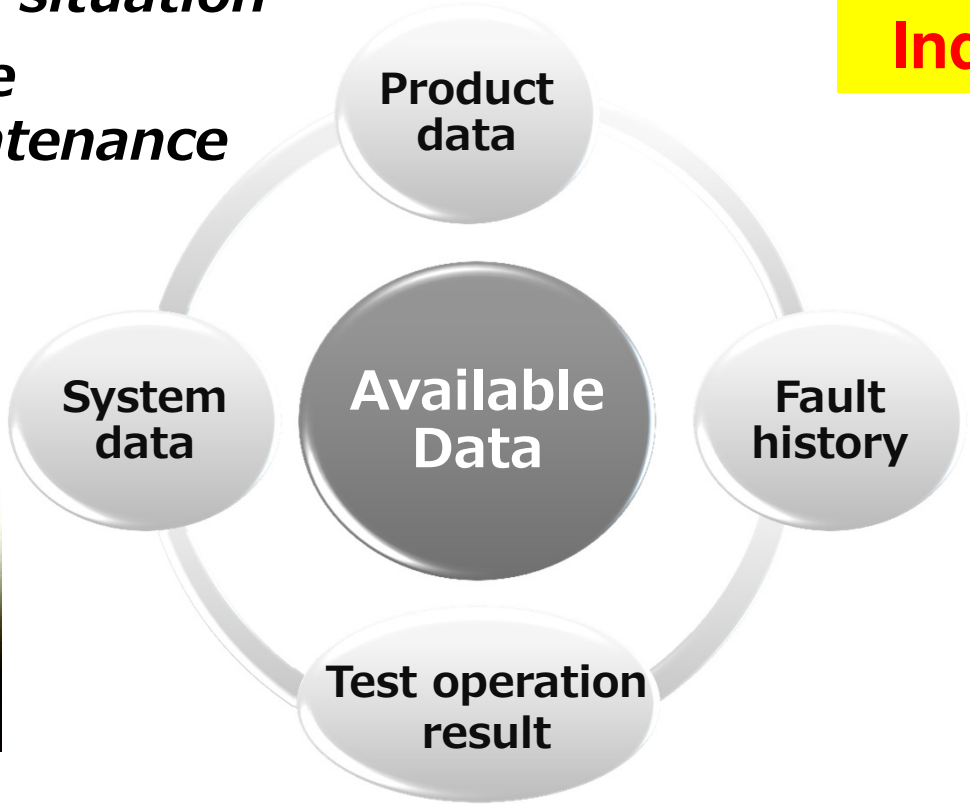
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SMMS-e New Wave Tool

In case of below situation

- ☑ ***Power failure***
- ☑ ***Service maintenance***
- ☑ ***Installation***

Industry first!





Smart phone



Valuable data can be extracted from the CDU even when there is power failure

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Indoor units

114 line-up

	4-way air discharge cassette type(MMU-)	Compact 4-way cassette type(MMU-)	2-way air discharge cassette type(MMU-)	1-way air discharge cassette type(MMU-)	Slim duct type(MMD-)	Concealed duct high static pressure type(MMD-)
Cooling capacity (HP)						
2.2kW (0.8HP)		AP0074MH-E	AP0072WH	AP0074YH-E	AP0074SPH-E	
2.8kW (1.0HP)	AP0094HP-E	AP0094MH-E	AP0092WH	AP0094YH-E	AP0094SPH-E	
3.6kW (1.25HP)	AP0124HP-E	AP0124MH-E	AP0122WH	AP0124YH-E	AP0124SPH-E	
4.5kW (1.7HP)	AP0154HP-E	AP0154MH-E	AP0152WH	AP0154SH-E	AP0154SPH-E	
5.6kW (2.0HP)	AP0184HP-E	AP0184MH-E	AP0182WH	AP0184SH-E	AP0184SPH-E	AP0186HP-E
7.1kW (2.5HP)	AP0244HP-E		AP0242WH	AP0244SH-E	AP0244SPH-E	AP0246HP-E
8.0kW (3.0HP)	AP0274HP-E		AP0272WH		AP0274SPH-E	AP0276HP-E
9.0kW (3.2HP)	AP0304HP-E		AP0302WH			
11.2kW (4.0HP)	AP0364HP-E		AP0362WH			AP0366HP-E
14.0kW (5.0HP)	AP0484HP-E		AP0482WH			AP0486HP-E
16.0kW(6.0HP)	AP0564HP-E		AP0562WH			AP0566HP-E
22.4kW(8.0HP)						AP0724H-E
28.0kW (10HP)						AP0964H-E

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Indoor units

114 line-up

	Concealed type (MMD-)	Ceiling type (MMC-)	High wall type 3 series (MMK-)	Floor standing concealed type (MML-)	Floor standing cabinet type (MML-)	Console type (MML-)
Cooling capacity (HP)						
2.2kW (0.8HP)	**AP0076BH-E**		**AP0073H**	**AP0074BH-E**	**AP0074H-E**	**AP0074NH-E**
2.8kW (1.0HP)	**AP0096BH-E**		**AP0093H**	**AP0094BH-E**	**AP0094H-E**	**AP0094NH-E**
3.6kW (1.25HP)	**AP0126BH-E**		**AP0123H**	**AP0124BH-E**	**AP0124H-E**	**AP0124NH-E**
4.5kW (1.7HP)	**AP0156BH-E**	**AP0157HP-E**	**AP0153H**	**AP0154BH-E**	**AP0154H-E**	**AP0154NH-E**
5.6kW (2.0HP)	**AP0186BH-E**	**AP0187HP-E**	**AP0183H**	**AP0184BH-E**	**AP0184H-E**	**AP0184NH-E**
7.1kW (2.5HP)	**AP0246BH-E**	**AP0247HP-E**	**AP0243H**	**AP0244BH-E**	**AP0244H-E**	
8.0kW (3.0HP)	**AP0276BH-E**	**AP0277HP-E**				
9.0kW (3.2HP)	**AP0306BH-E**					
11.2kW(4.0HP)	**AP0366BH-E**	**AP0367HP-E**				
14.0kW(5.0HP)	**AP0486BH-E**	**AP0487HP-E**				
16.0kW(6.0HP)	**AP0566BH-E**	**AP0567HP-E**				
22.4kW(8.0HP)						
28.0kW (10HP)						

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Indoor units

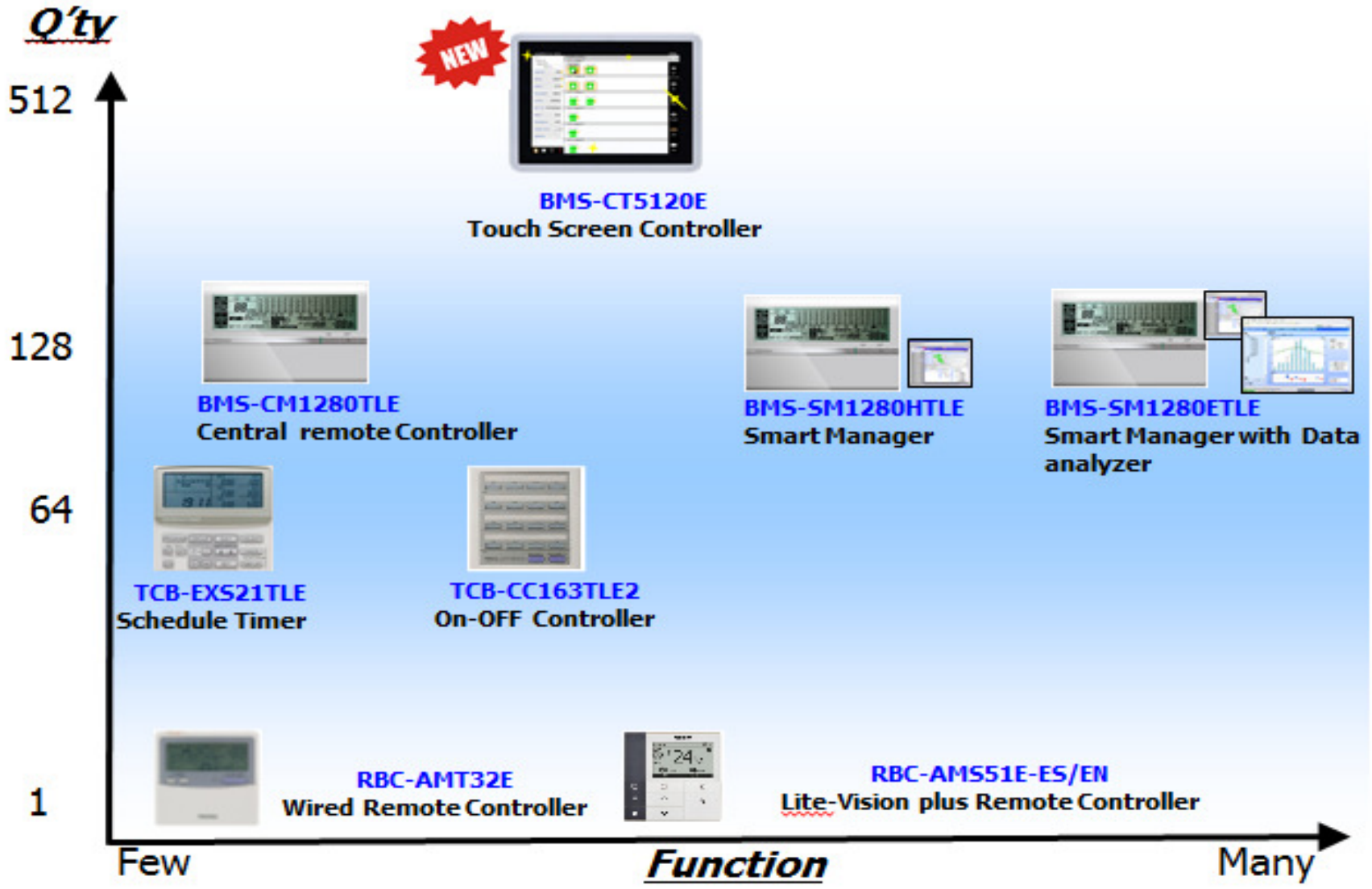
114 line-up

	Floor standing type (MMF-)	Floor standing type (MMF-)	Fresh air intake indoor unit type (MMD-)	Air to air heat exchanger with DX coil (MMD-)
Cooling capacity (HP)				
2.8kW (1.0HP)				**VN502HEXE**
3.6kW (1.25HP)				
4.5kW (1.7HP)	**AP0156H-E**			**VN800HEXE**
5.6kW (2.0HP)	**AP0186H-E**			
7.1kW (2.5HP)	**AP0246H-E**			**VN1002HEXE/HEXE2***
8.0kW (3.0HP)	**AP0276H-E**			
9.0kW (3.2HP)				
11.2kW(4.0HP)	**AP0366H-E**			
14.0kW(5.0HP)	**AP0486H-E**		**AP0481HFE**	
16.0kW(6.0HP)	**AP0566H-E**			
22.4kW(8.0HP)		**AP0723DH-V**	**AP0721HFE**	
28.0kW (10HP)		**AP0963DH-V**	**AP0961HFE**	
45.0kW (16HP)		**AP1443DH-V**		
56.0kW (20HP)		**AP1923DH-V**		

	Air to air heat exchanger (VN-)
Air volume (m/h)	
150CMH	**M150HE**
250CMH	**M250HE**
300CMH	**M300HE**
500CMH	**M500HE**
650CMH	**M650HE**
800CMH	**M800HE**
1000CMH	**M1000HE**
1500CMH	**M1500HE**
2000CMH	**M2000HE**

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Product Position Toshiba Controls



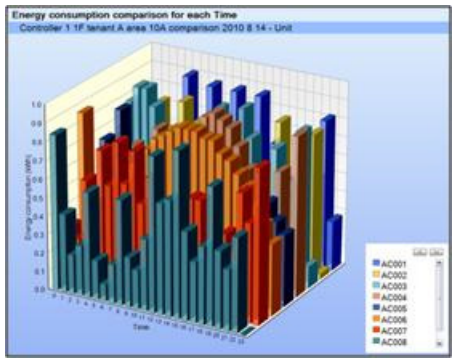
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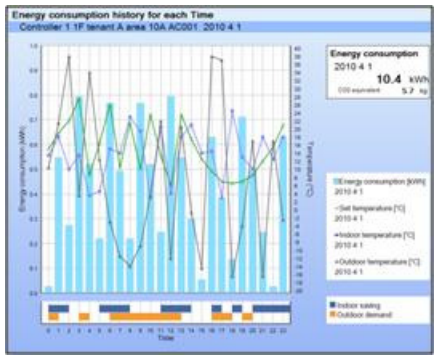
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Connectable BMS Controllers

Application	Name	Model	Appearance
BMS	Touch screen controller	BMS-CT5121E	
	Smart Manager with web browser control capability	BMS-SM1280HTLE	
	Smart BMS Manager with data analyzer	BMS-SM1281ETLE	

<Graph chart sample by data analyzer>





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Connectable Open Network BMS

Application	Function	Model	Appearance
Open network	BACnet ®	BN Interface BMS-IFBN640TLE	
	LonWORKS ®	LN Interface TCB-IFLN642TLE	
	Modbus ®	Modbus Interface TCB-IFMB641TLE TCB-IFMB640TLE	

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