

# Toshiba Optimum

**R32**  
REFRIGERANT



TESTED IN  
FINLAND  
**TOSHIBA**  
RELIABLE  
QUALITY



**TOSHIBA**  
Leading Innovation >>>

# Residential Inverter **Heat pump** unit.

**TOSHIBA**  
Leading Innovation >>>

**RAS-25PKVSG-ND / RAS-25PAVSG-ND**  
**RAS-35PKVSG-ND / RAS-35PAVSG-ND**

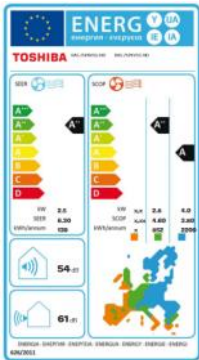
**R32**  
REFRIGERANT



FCU	Dimensions	H x W x D	(mm)	293 x 798 x 230
CDU	Dimensions	H x W x D	(mm)	550 x 780 x 290

# High-class energy efficiency

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**R32**  
REFRIGERANT



**High SCOP of 4.6**

Outdoor unit		RAS-25PAVSG-ND	RAS-35PAVSG-ND
Indoor unit		RAS-25PKVSG-ND	RAS-35PKVSG-ND
Cooling capacity	kW	2.5	3.5
Cooling range (min. - max.)	kW	1.1 - 3.5	1.1 - 4.5
Power input (min. - rated - max.)	kW C	0.22 - 0.56 - 0.87	0.22 - 0.89 - 1.37
Pdesignc	kW	2.5	3.5
EER	W/W	4.46	3.93
SEER		6.3	6.8
Energy efficiency class	C	A++	A++
Heating capacity	kW	3.2	4,2
Heating range (min. - max.)	kW	1.0 - 6.5	1.0 - 7.7
Power input (min. - rated - max.)	kW H	0.20 - 0.65 - 1.9	0.20 - 0.95 - 2.33
Pdesignh	kW	2.8	3.4
COP	W/W	4.92	4,42
SCOP		4.6	4,6
Energy efficiency class	H	A++	A++

# Heating performance improvement

- ❖ More energy efficient than legacy DSK6 with SCOP A++
- ❖ Highly reliable in competition !!! operation condition down to -25° C



	10k					13k				
	Optimum	SUZUMI+	Nordic (DSK6)	Pana	Melco	Optimum	SUZUMI+	Nordic (DSK6)	Pana	Melco
		410a		(NZ*SKE)	(EF*VEH)		410a		(NZ*SKE)	(EF*VEH)
Heat Cap. kW	2.8	2.8	3.0	2.8	2.4	3.4	3.0	3.5	3.6	2.9
SCOP( avg)	4.6	4.0	4.1	4.6	4.6	4.6	3.9	4.0	4.6	4.5
Energy grade (Heat)	A++	A+	A+	A++	A++	A++	A	A+	A++	A+
Max Heat cap. @+7° c	6.5	4.8	6.5	6.0	4.2	7.7	5.3	7.7	7.2	5.5
Max Heat cap. @-7° c	3.9	-	3.8	3.8	-	4.4	-	4.3	4.5	-
Max Heat cap. @-15° c	3.0	-	3.0	3.2	-	3.6	-	3.4	4.1	-
Max Heat cap. @-25° c	2.2	-	-	2.0	-	2.6	-	-	2.9	-
Usable range (° c)	-25	-15	-20	-20	-20	-25	-15	-20	-20	-20

# New Appearance

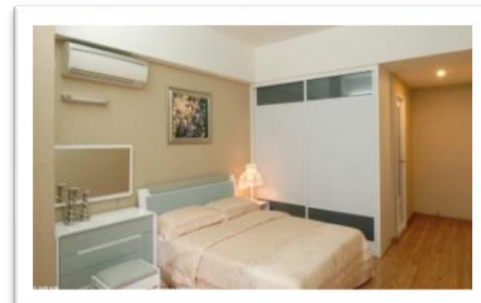
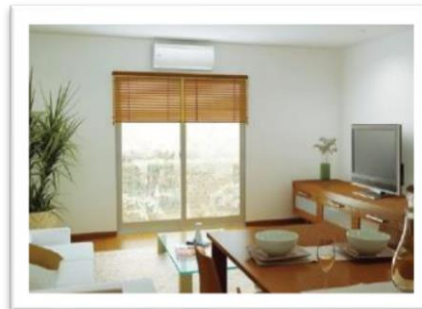
## New Grille

New Toshiba Nordic has been dedicated designed to fine-tune with modern interior

Small front-area helps FCU doesn't look bulky

Glossy material reflects premium & luxury

Big round-shape makes unit look slimmer than actual



# Blue / Orange Display

- New chassis equips **Blue** & **Orange** LED to indicate Cooling or Heating operation

**New !!**



**Cooling** operation



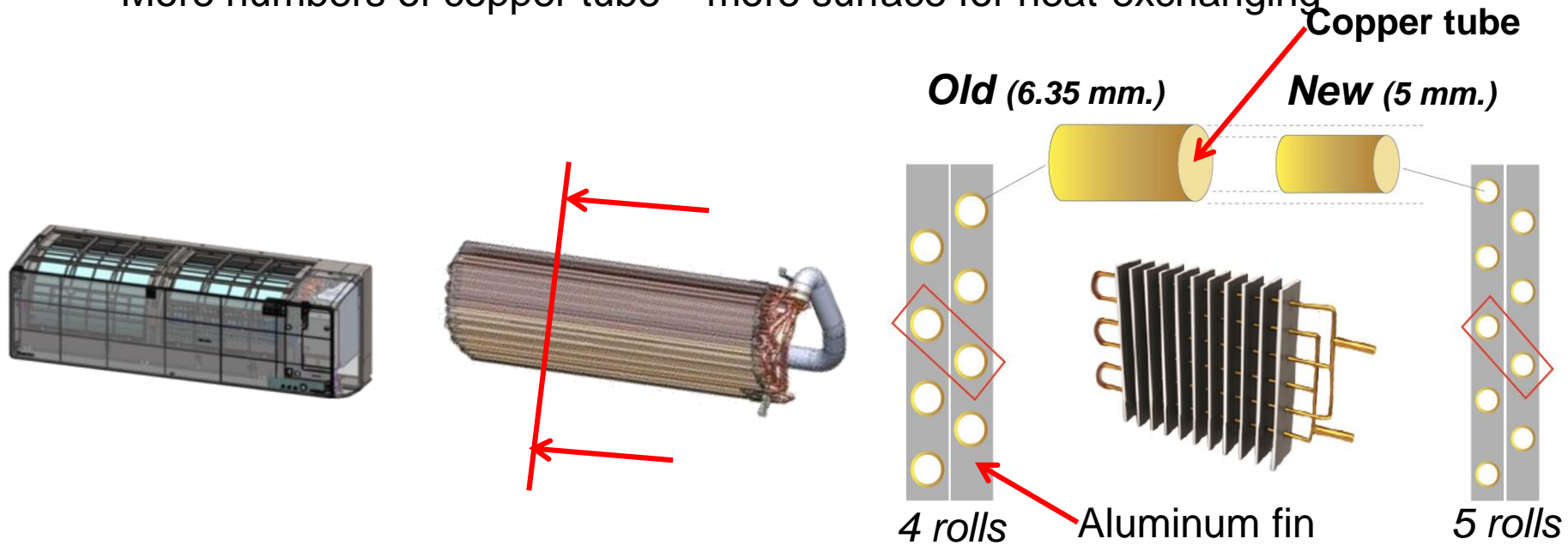
**Heating** operation

# Selling point

## 1) Condensed piping design

Smaller diameter (6.35 → 5.0 mm.) of copper tube

More numbers of copper tube – more surface for heat-exchanging



## 2) Bigger fan

13% bigger to increase airflow

- High air flow

**13%  
bigger**

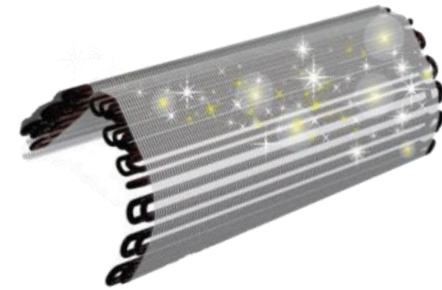




# Selling point

## 3) Magic coil – Dustless

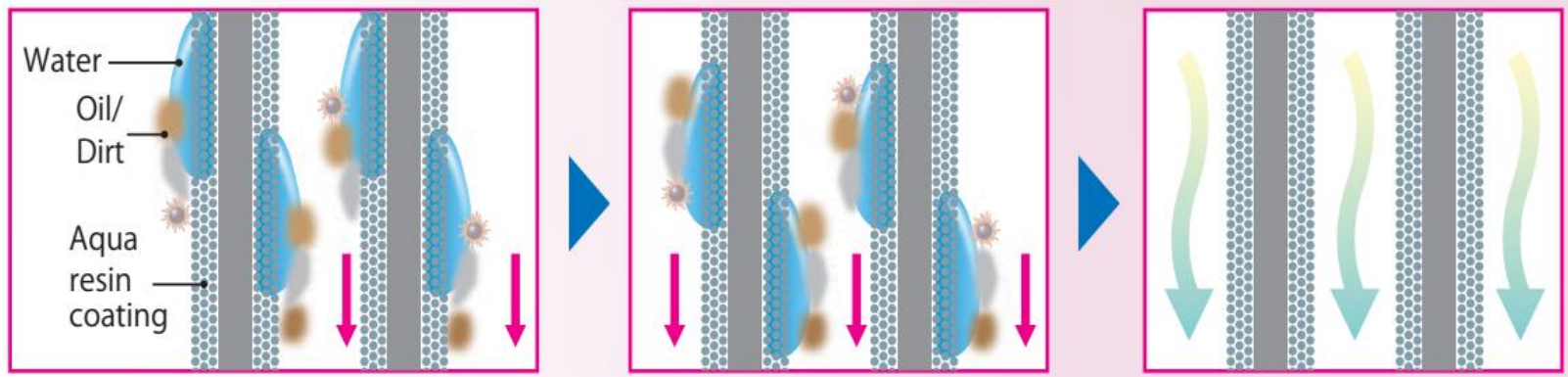
### What is it & How it works?



*oil & dirt cannot stick fin  
because of special layer*

*condensed water  
washes oil & dirt*

*always clean as new !!!!*



## Consumer's benefit

- 1) As the coil keeps clean (no-dust), energy efficiency is maintained as equal as a new unit (less-electrical bill)
- 2) Healthy & Fresh air / none bad-smell (mold & bad odor)



# Selling point

Field tests @ 4 convenient stores

Normal coated coil

Magic coil

It takes 15 mt's. until Magic coil get as dirt as normal coil

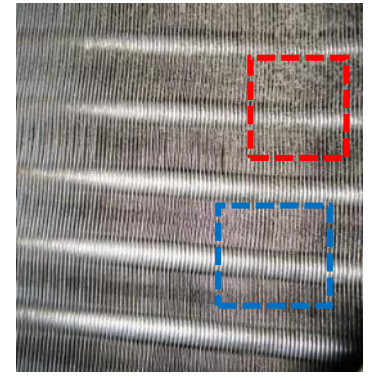
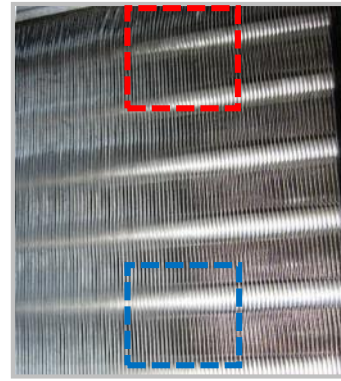
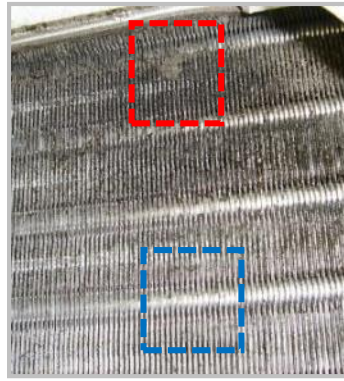
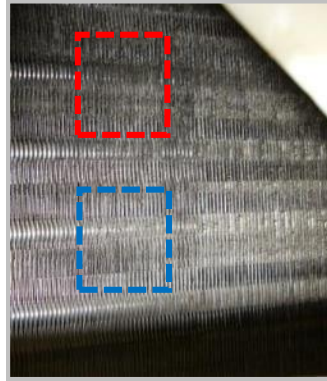
shop 1 @ 10 months

shop 2 @ 11 months

shop 3 @ 12 months

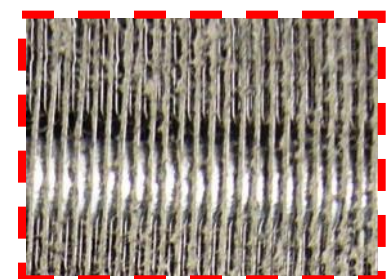
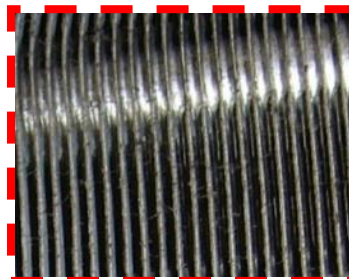
shop 4 @ 15 months

top



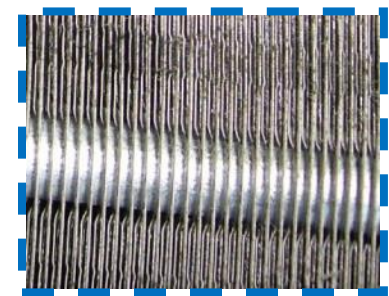
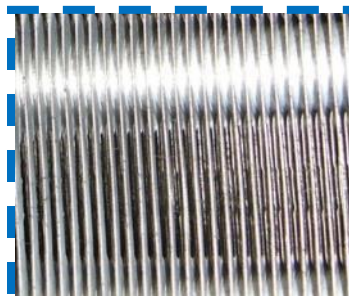
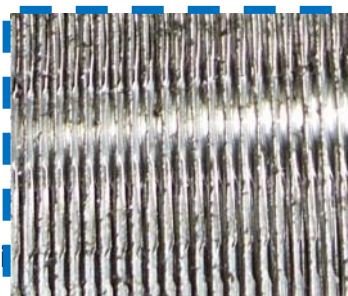
down

top



zoom

down



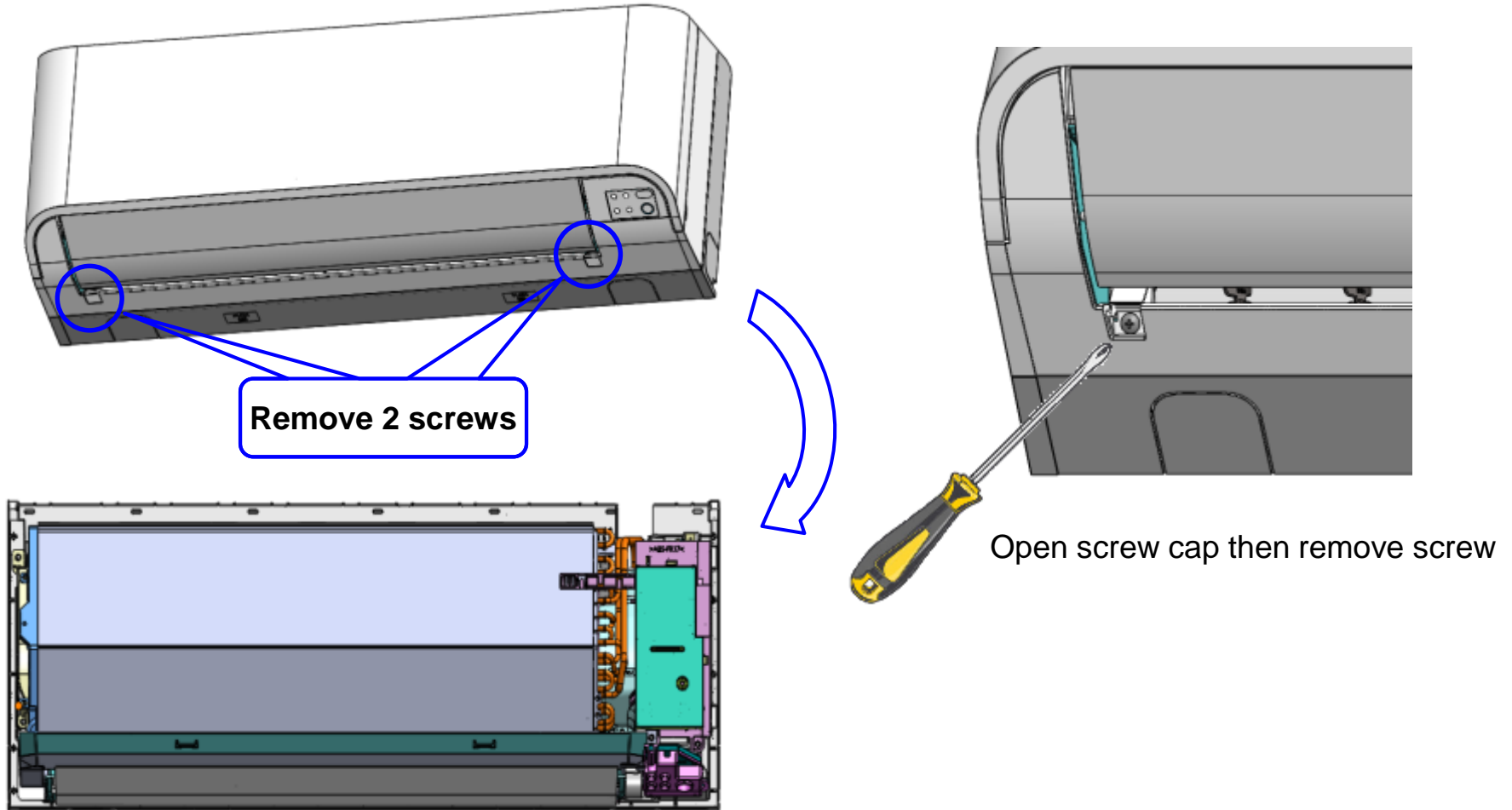
condit

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# Selling point

## 4) Service friendly construction – EZ clean Processes to remove drain-pan

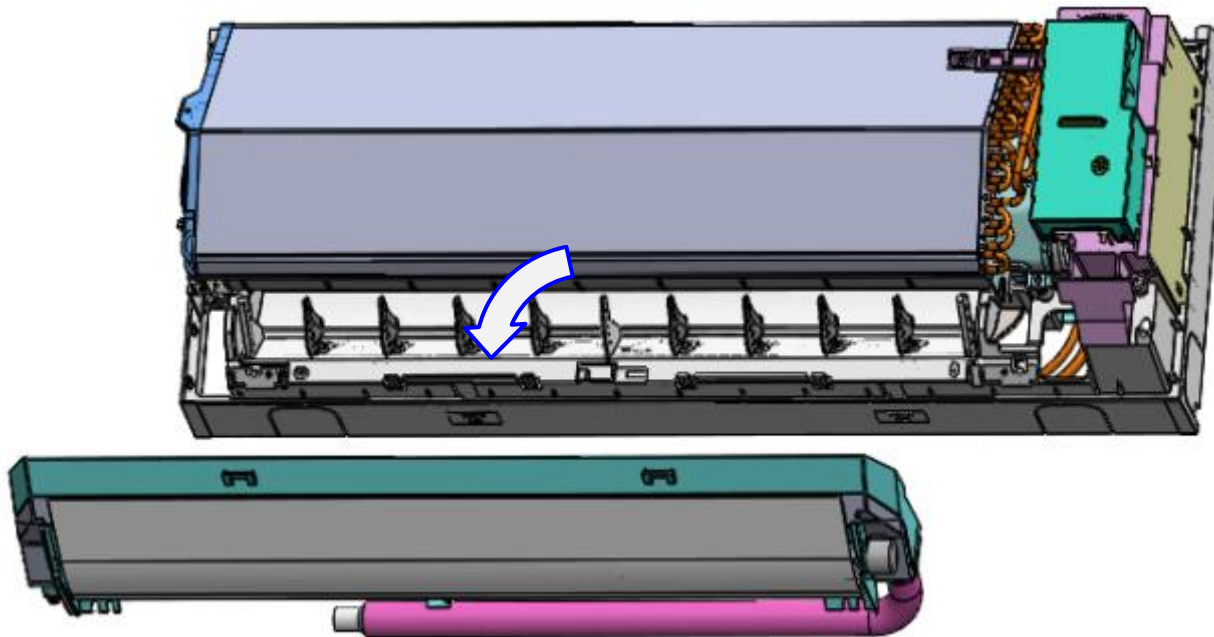
- 1) Take off panel by remove 2 screws



# Selling point

## 4) Service friendly construction – EZ clean

2) Simply take off drain-pan

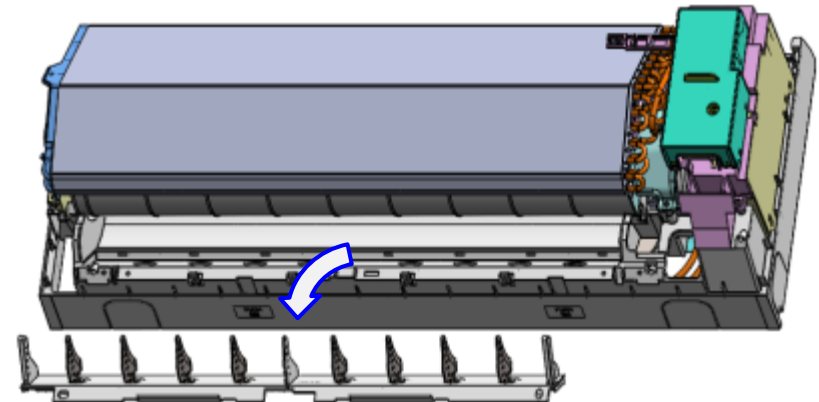
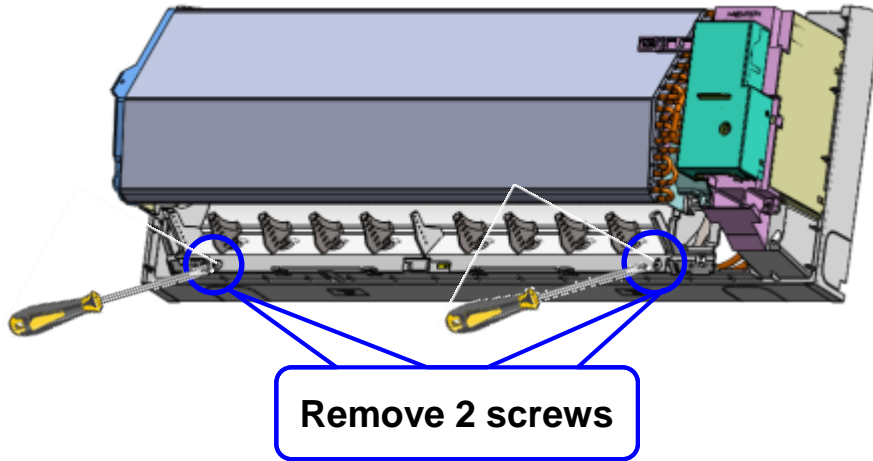


Take off **drain-pan**

# Selling point

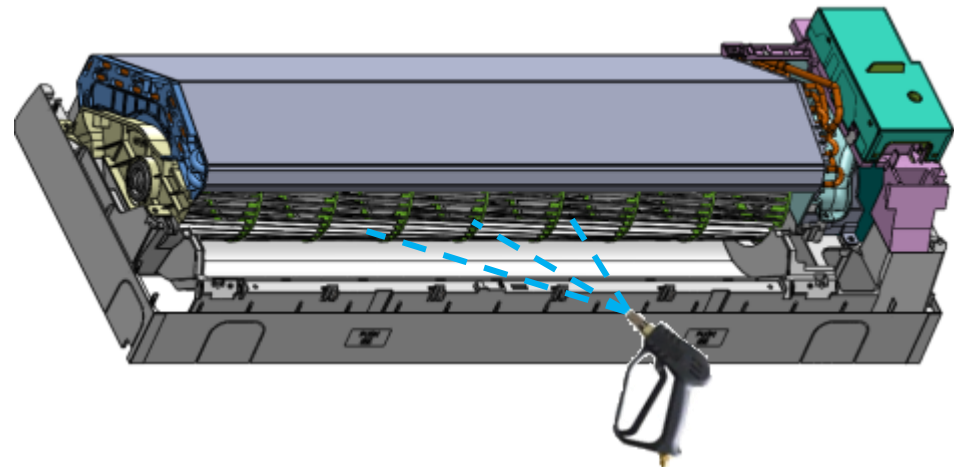
## 4) Service friendly construction – EZ clean

3) After that, we can do further clean



- Remove 2 screws for fix vertical louver set
- Take off vertical louver set

Inside of evaporator and cross-flow fan can be clean by high-pressure water





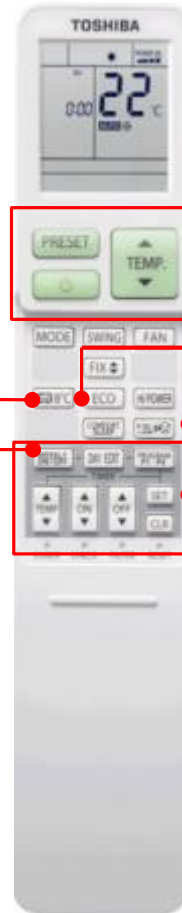


# User-friendly, Elegant & Intelligent Remote Control

# TOSHIBA

Leading Innovation >>>

Elegant, well designed remote control with bigger screen for easier use



### 8° C heating

Indoor temp kept @ 8C, but temperature can be set between 5 and 13 Deg C

### Weekly timer

Weekly timer allows to set "on and off" times or program settings every 24 hours. Temperature and ON/OFF operation can be programmed up to 4 different settings/day and 7 different programs in a week. Setting can be ON/OFF, Temperature set, Operation mode, and Fan speed

Improved Back lit Screen – Whiter, Bigger, Clearer!

Simple 3 control buttons for ease of use

### Fire place

Heating mode Fan motor don't stop.

### Silent Operation (outdoor unit)

Reduce noise of outdoor unit

### On-demand defrost

### Other Carryover Features

- Preset
- Power select
- Comfort sleep
- Hi-power
- Eco-logic

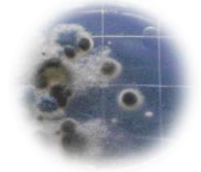
**Self cleaning** with low density ozone



Normal Operation

Moisture stays trapped inside

COOL AIR-FLOW

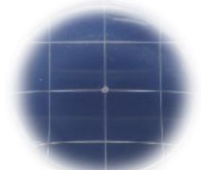


No self cleaning

Self-cleaning Function

20minutes of fan operation after shut down dries the moist air and helps reduce mold formation.

NATURAL AIR-FLOW



Self cleaning

Toshiba's self-cleaning function is designed to **reduce the humidity that causes mold to form** inside an air-conditioning unit.

Self-cleaning Operation:

Status of LED	Cool/Dry Operation	Press Start/Stop button	20 minutes later
Indoor Fan Status	ON	ON <small>(Automatic turn off after 20 min.)</small>	OFF

This advanced, efficient system reduces moisture in the coils. When you turn off your air conditioner, the internal fan activates and dries the moisture in the coil for 20 minutes, then turns off automatically.

# Fireplace *UNIQUE !!*

Keep indoor unit's fan blowing continuously during thermo off, to circulate heat from other sources over the room.

## Fireplace 1:

- The indoor unit's fan will continue to run by the same speed, previously selected by end-user.

## Fireplace 2:

- The indoor unit's fan will continue to run at super-low speed, programmed from factory.






# Silent operation (outdoor unit) **UNIQUE !!**


Operate outdoor unit silently to ensure either yourself or neighborhood will have a tight sleep in nighttime.

This feature will be very helpful, whenever heatpump is installed in apartment



**Silent 1:** 

Though operating silently, the Heating capacity is still prioritized to ensure having sufficient comfort inside the room. This setting is a perfect balance between the Heating and the Sound level of outdoor unit.

**Silent 2:** 

Compromising the Heating capacity to the Sound level in any circumstance, where the outdoor unit's sound level is highly prioritized. This setting can reduce the maximum sound level of outdoor unit by 4 dB(A).



*Note: While activating of Silent operation, inadequate heating may occur.*

# 8° C heating mode



**Note: 8° C setting can be adjusted to any temperature between 5° C and 13° C**

When you are out of summer cabin, but you want to keep room temperature over the freezing point to protect everything from cold damage. This way it is nice and warm when you arrive!



# On-demand defrosting *UNIQUE !!*

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Before

After

Outdoor unit can normally be defrosted automatically!

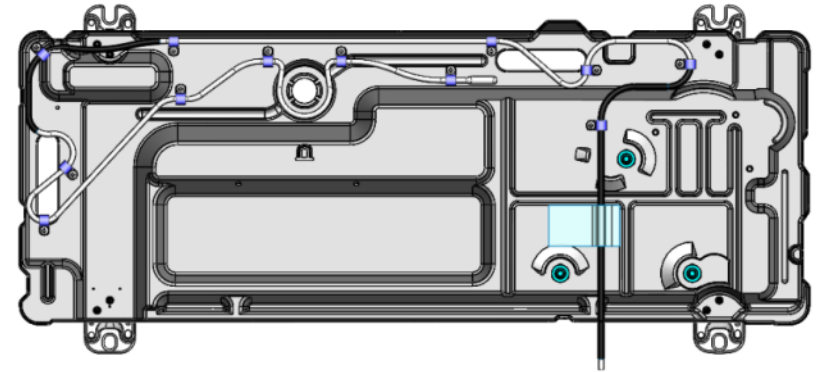
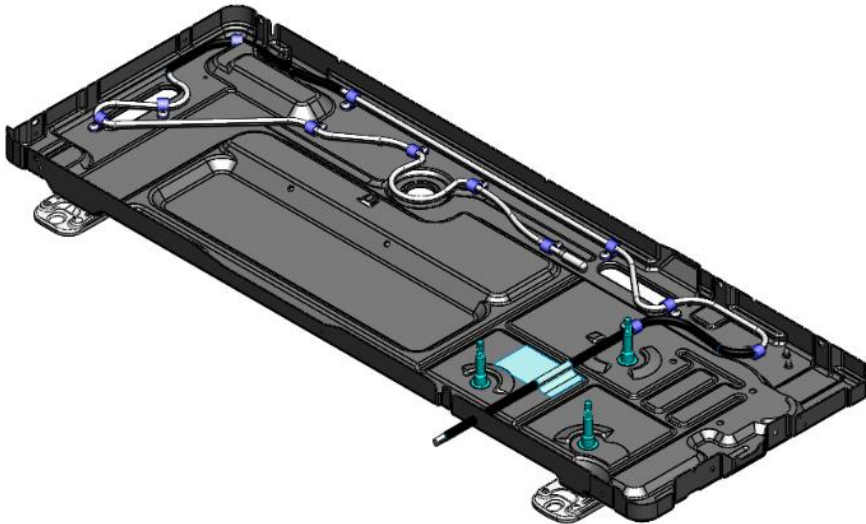
However, in tough conditions, one can **manually** perform defrosting by pressing SET button on remote controller





# Anti-icing CDU *(The most important of Nordic H/P is reliability)*

- Heater cable for defrost icing in pan of CDU
- Ensure to cope with -25° C outside temp.



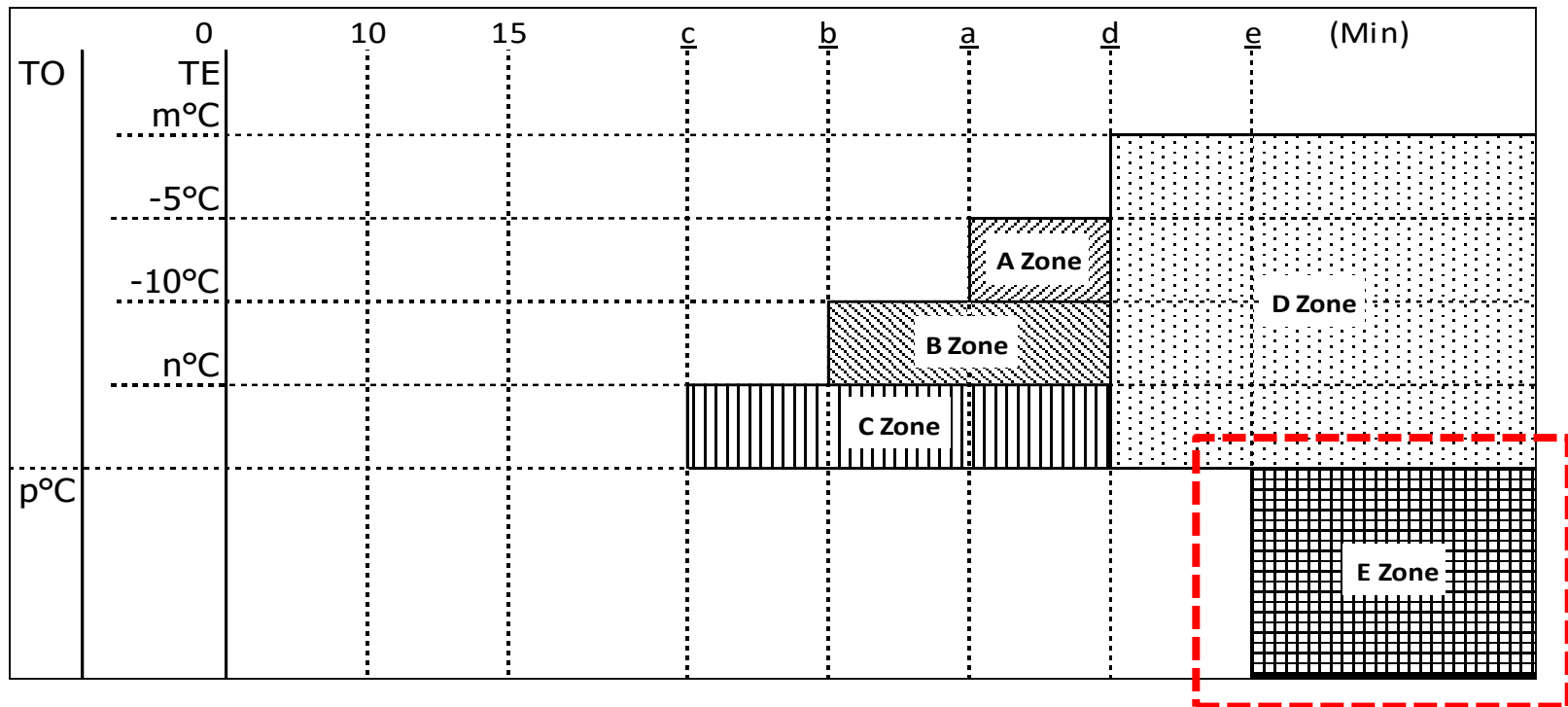
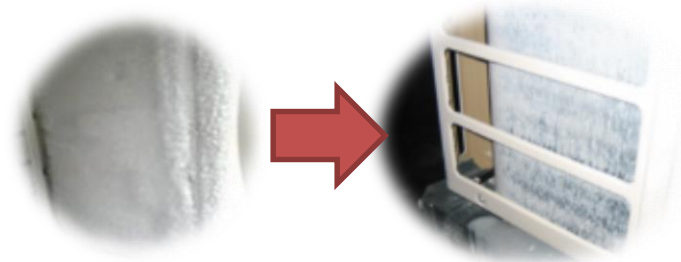
*Manual Defrost* + *Adjusted heating cable* = *Perfect Heatpump*

**Caution:** Consult Heatpump specialist before rearrange heating cable out of cabinet, as it may cause a human-fatal.

# Sophisticated Defrosting Algorithm

**Add E-Zone** in Automatic Defrost function.

Reduce time of Defrost when ambient temp. lower than  $-10^{\circ}\text{C}$ , giving more time to heat, and deliver better comfort experience.



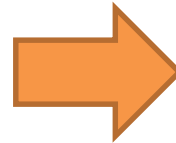
# Double O-rings in packed valve

Improved Safety and Reliability via double O-rings in packed valve (Liq/Gas) to protect the risk of refrigerant leakage from Low-ambient temperature condition.

Old model



New model

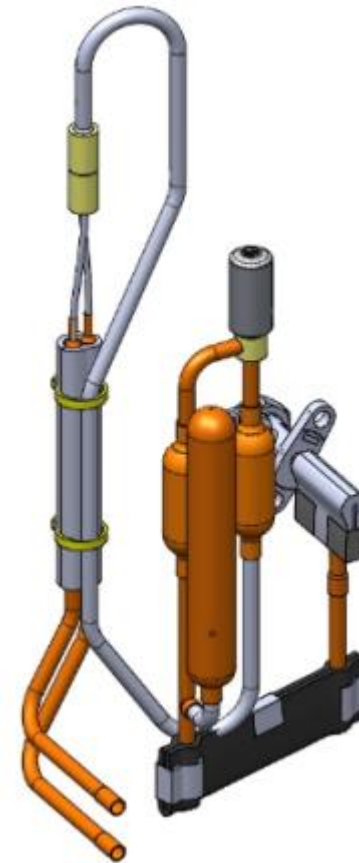


# Dryer in outdoor unit

A step-up of product reliability which is a heart of TOSHIBA philosophy.

Dryer in outdoor unit to make sure only liquid refrigerant reaches expansion valve.

It also contains a dryer, a moisture absorbing element, to help "dry out" the refrigerant.





# High pressure switch in outdoor unit

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- Not only safety protection by software control, the new SHORAI also comes with a High-pressure switch as a 2<sup>nd</sup> protection element.
- Thanks to this physical safety device, Compressor and other parts are protected any damage from abnormal High pressure.



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