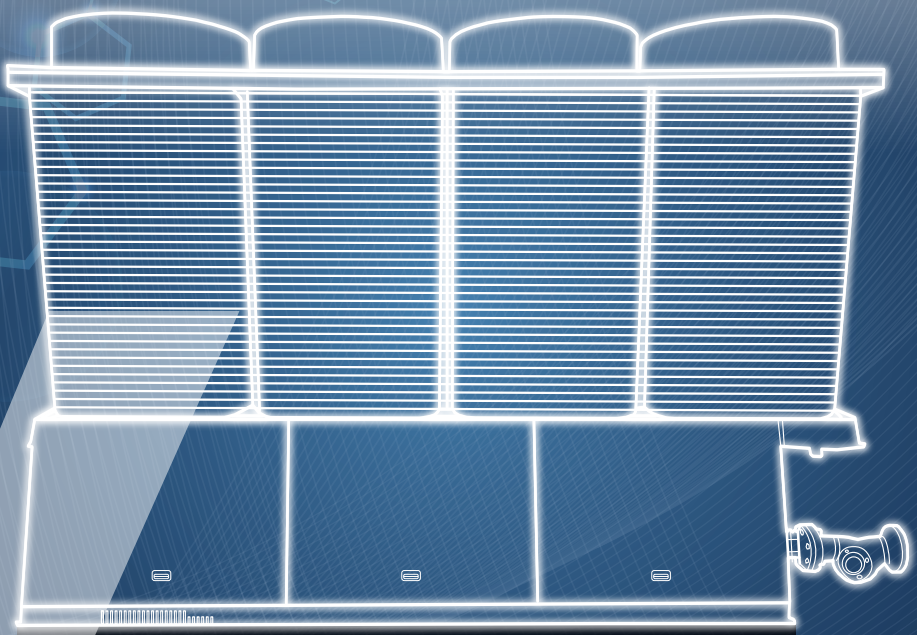
TOSHIBA

HIGHER quality in LIFE



# CHILLER & HEATPUMP
# *UNIVERSAL SMART X*

THE NEW R32 DIMENSION OF REFRIGERATION & HEATING

# THE NEW R32 DIMENSION OF REFRIGERATION & HEATING

Modular design ensures break-leading operational reliability as well as the most compact dimensions with maximum flexibility.

The range of application is also impressive – whether sub-zero cooling at the highest outside temperatures or year-round heating operation. The proven TOSHIBA twin rotary compressor enables outstanding performance – even in the partial load range – due to its stepless controllability down to 5 % nominal capacity.

The TOSHIBA Chiller & Heatpump UNIVERSAL SMART X is the perfect solution for industrial and commercial applications from 150 kW to 25,6 MW.

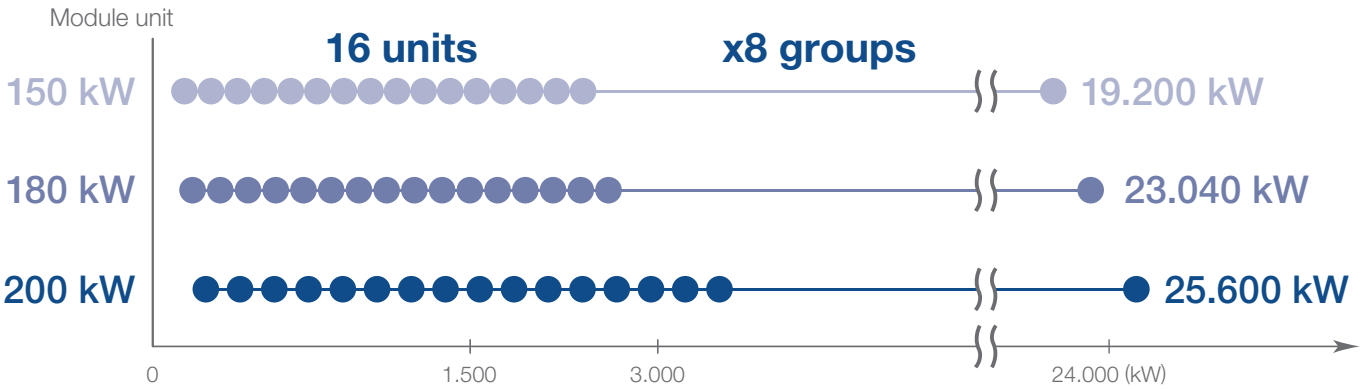
TOSHIBA

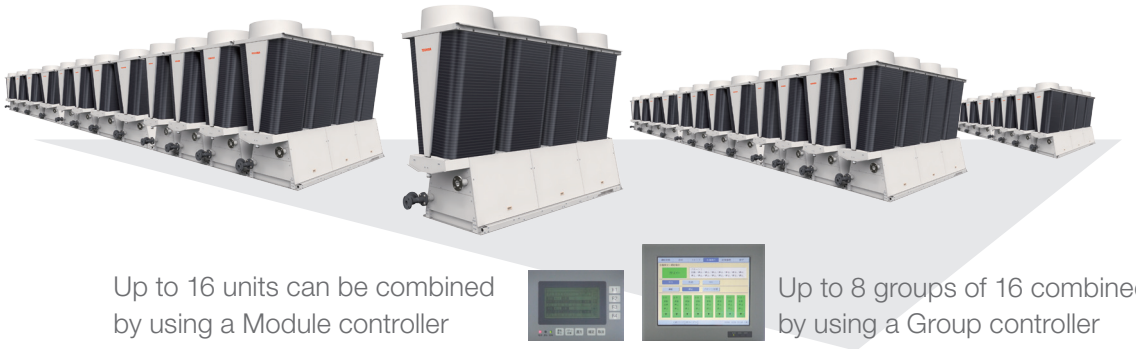
# OVERVIEW

## USX Line Up

| Module Capacity | Operation Mode | Heating Mode | Pump | Medium | Efficiency |
|---|---|---|---|---|---|
| 150 kW | Cooling only | Basic | Without pump | Water | Basic EER |
| 180 kW | Heating & Cooling | High Heating Capacity | Integrated pump<br>– 1,5 kW<br>– 2,2 kW<br>– 3,7 kW<br>– 5,5 kW<br>– 7,5 kW | Water & Brine | High EER |
| 200 kW | | | | Brine | |

## Capacity range



Up to 16 units can be combined by using a Module controller

Up to 8 groups of 16 combined-units by using a Group controller

# Operation Range

## Basic

150 kW | 180 kW | 200 kW

| | | | |
|---|---|---|---|
| Leaving water temperature (Note 1) | Cooling | °C | -15 – +30 |
| | Heating (Note 2+3) | | 25 ~ 55 |
| | Temperature difference (inlet/outlet) | | 5 ~ 10 |
| Outside air temperature | Cooling | | -15 ~ 52 (Note 4) |
| | Heating (Note 2+3) | | -15 – +43 |

Note 1: LWT not higher than 35°C at cooling or not lower than 20°C at heating operation is allowable till 1 hour after starting up. After then, however, LWT must be within the operating range. Control it with bypass pipe if needed.
Note 2: For heat pump models only. -20°C is for 180 kW powerful heating.
Note 3: Depending on the outdoor air temperature, leaving hot water temperature is limited as below.

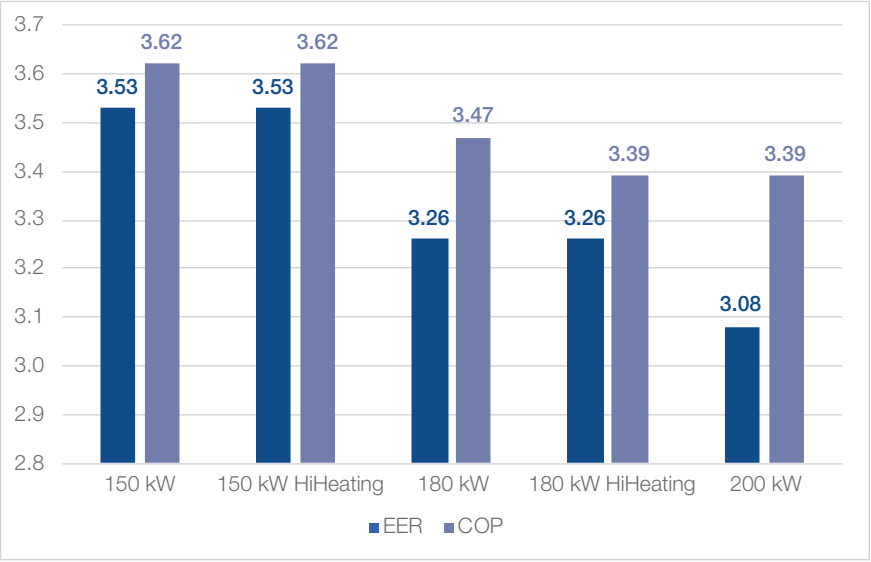
## HiHeating Type

150 kW | 180 kW

| | | | |
|---|---|---|---|
| Leaving water temperature (Note 1) | Cooling | °C | -15 – +30 |
| | Heating (Note 2+3) | | 25 ~ 55 |
| | Temperature difference (inlet/outlet) | | 5 ~ 10 |
| Outside air temperature | Cooling | | -15 ~ 52 (Note 4) |
| | Heating (Note 2+3) | | -25 – +43 (Note 5) |

Note 4: The range of water temperature control may become larger when the cooling operation load is low.
Note 5: System performance is not guqaranteed between -20°C and -25°C outside air temperature. Please be aware that system performance can be effected by external factors (for example snow drifts, the surrounding environment etc.) even when the outside air temperature is inside the operating envelope shown above.

# High Energy Efficiency




*Conditions:
Cooling EER LWT 7°C, EWT 12°C, OAT 35°C
Heating COP LWT 45°C, EWT 40°C, OAT 7°C DB, 8°C WB

- Extremely high full load and part load energy efficiency as a result of the combination between low GWP refrigerant R32 and newly developed DC inverter compressor.
- 150 kW model is a top class energy efficient model.
- Precise adjustment of water flow volume and water pressure based on required load by using internal pump module with variable flow bypass – control resulting in even higher system efficiency.

# MARKET CAPTURE

The success story of the TOSHIBA Universal Smart X began a long time ago. In 1997, TOSHIBA launched the predecessor of today's USX on the Japanese market. Initially intended for industrial use only, continuous work was done to improve the functions and efficiency of the equipment. In 2010, the first USX with the world's largest capacity high-efficiency inverter twin rotary compressor was launched. This compressor was outdone by the next world's largest capacity high-efficiency inverter in the year 2017. The current models of the USX conquered the Asian Market 2020 and arrived for the first time in Europe in October 2021.

## Important stepstones

| | | |
|---|---|---|
| 1997 | Integrated-type Screw Chiller<br>50 ~ 160HP | Refrigerant R134a |
| 2003 | Flex Module Chiller FMC<br>30, 40 HP | Refrigerant R407C |
| 2006 | Super Flex Module Chiller SFMC<br>30, 45 HP | Refrigerant R410A |
| 2010 | Universal Smart X<br>30, 40, 50 HP | Refrigerant R410A |
| 2015 | USX Series 3 | |
| 2017 | Universal Smart X USX EDGE Series<br>60, 70 HP | Refrigerant R410A |
| 2020 | Universal Smart X USX EDGE Series<br>50, 60, 70 HP | **Refrigerant R32** |
| 2021 | Arrival of USX in Vienna<br>50, 60, 70 HP | **Refrigerant R32** |


## Big clients like the Marina Bay Sands (Singapore) trust the USX.

Dear Reader!

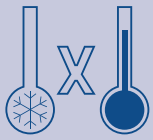
We would like to inform you that we unfortunately made a mistake in our printing version on page 7 and 46/47. The Universal Smart X modules are not used at Marina Bay Sands, but at the adjacent Gardens by the Bay.
Gardens by the Bay is a 101-hectare park area that was created in the central district of Singapore on artificially raised land. With the park, the city-state of Singapore is pursuing the strategy of creating a city in a garden, so that the quality of life of the inhabitants is improved by green corridors.

Please forgive this confusion.

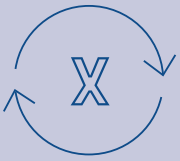
# THE 8 SMART FEATURES

Even at first glance, the new Universal Smart X makes a competent impression. The TOSHIBA USX reaches the installation site in a compact, modular form with a concise X design. Combined side-by-side to save space, a total output of up to 25.600 kW can be achieved with up to 128 modules. Thanks to its modularity as well as its perfect part-load performance, the system can realize this enormous power in theoretically infinite gradations from 5 % of a single unit up to maximum capacity.

**The 8 Smart Features show how the intelligent system design creates significant savings of area and energy resources as well as perfect reliability.**

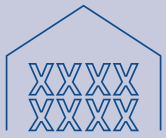


WIDE OPERATION RANGE



TWIN ROTARY COMPRESSOR – STEPLESS CONTROLLED 5 – 100 %

OPERATIONAL RELIABILITY BY MODULAR DESIGN

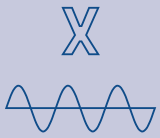


ALL YEAR PROMPT DELIVERABLE FROM VIENNA WAREHOUSE

150 KW – 25,6 MW PERFORMANCE RANGE SCALED MODULAR

SPACE SAVING X-FRAME CHASSIS DESIGN

WIFI CONNECTIVITY



HIGH ELECTRIC POWER FACTOR

Feature 1

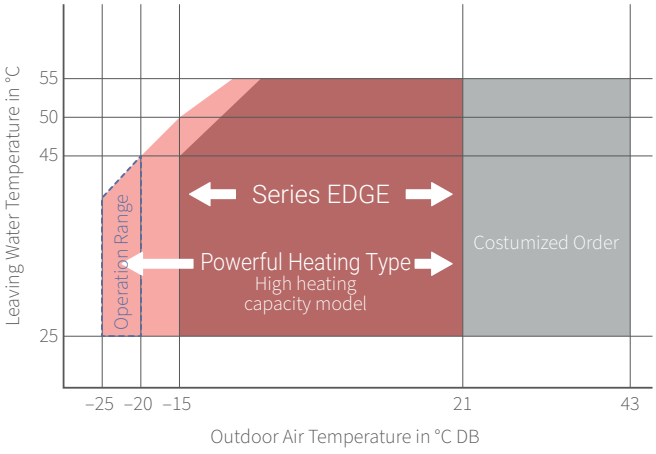
# WIDE OPERATION RANGE

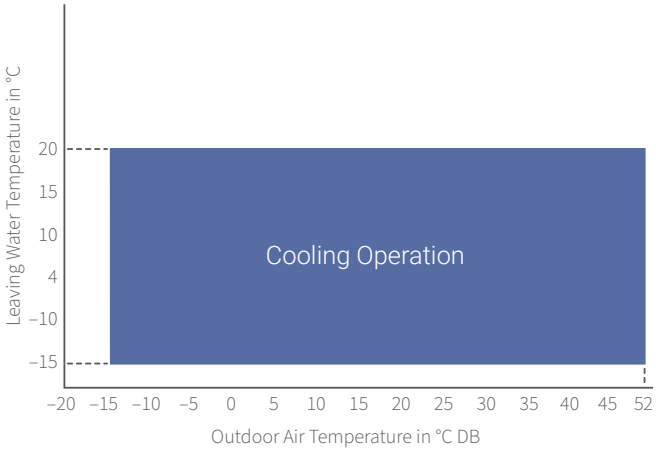
The USX delivers heat and cold
reliable all year round

USX, which specialize in year-round heating, are called HiHEATING CAPACITY.
They reliably produce hot heating water, for example for production processes or building heating, up to outside temperatures of frosty -25°C or tropical +43°C.
Regardless of whether the cold water generation for

- Comfort air conditioning of large-volume buildings
- Processes
- Data center
- Food technology
- Cold rooms
- Medical technology
- Ice rinks

is used – leaving water temperatures from -15 to +55°C cover every requirement.
Operation from -25 to +52°C outside temperature is guaranteed.

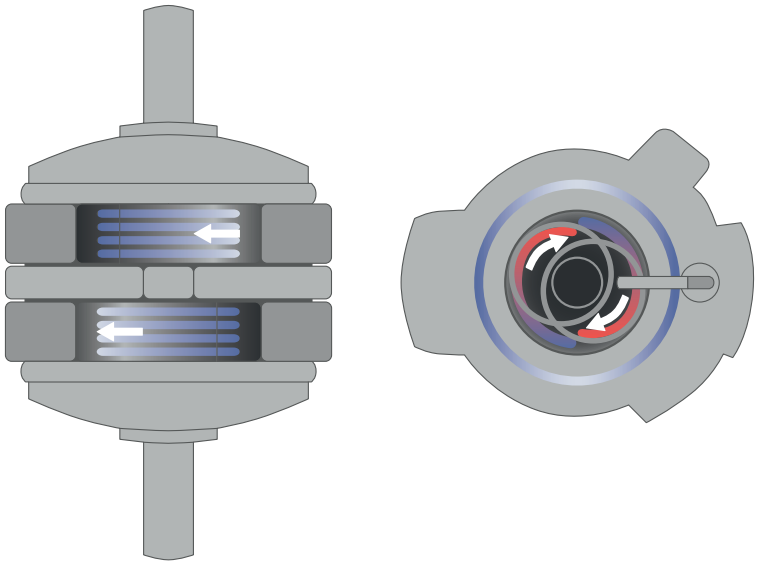


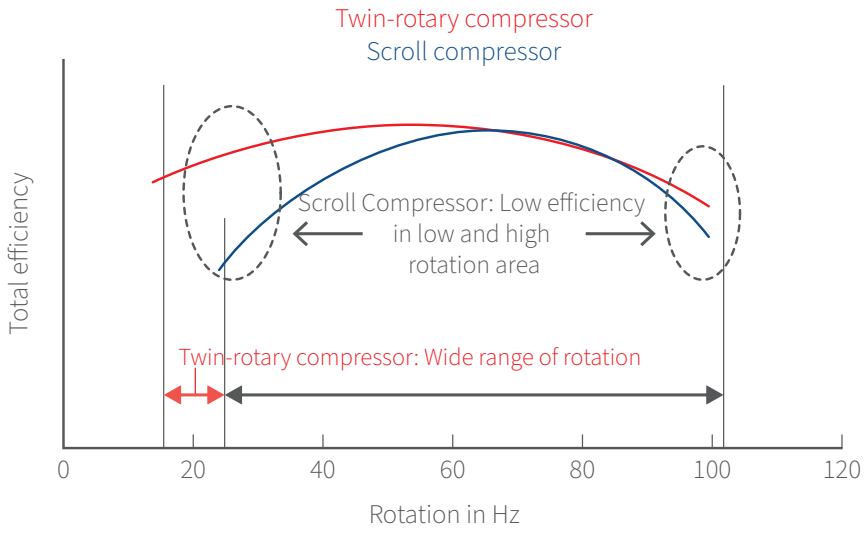



Feature 2

# TWIN ROTARY COMPRESSOR – STEPLESS CONTROLLED 5 – 100 %

Energy-efficient control in the partial load range down to 5 % thanks to the proven TOSHIBA twin rotary compressor






The TWIN rotary compressor with inverter control from TOSHIBAs own development & production forms the power cell of the system. This team proves its longevity, efficiency and performance in literally millions of home & business air conditioning systems worldwide every day.
As one of the 4 hearts in every USX module, the compressor creates the requirements for the distinctive benefits of the system: partial load operation of a module down to 5 % of the nominal output, outside temperature range from -25°C to +52°C, flow temperatures from -15°C to +55°C can thus be achieved.

The choice of refrigerant is also out of the question for TOSHIBA. One of the most up-to-date, economical and environmentally friendly refrigerants is used here: R32.

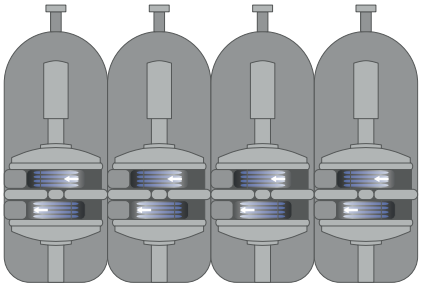
Feature 3

# OPERATIONAL RELIABILITY BY MODULAR DESIGN

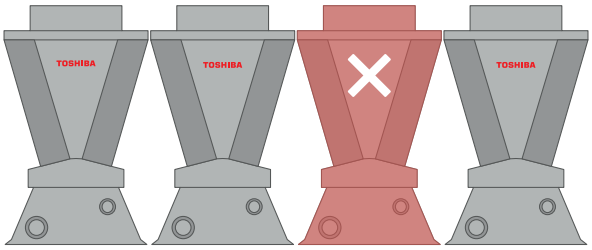
Maximum reliability and redundancy through the 4 in 1 module concept

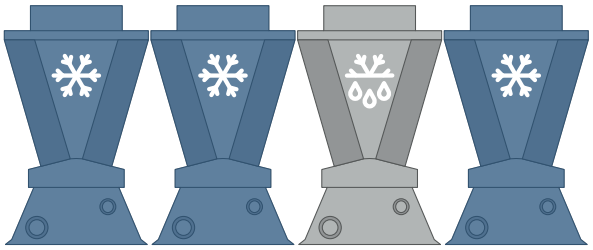
The 4-in-1 module-in-module concept ensures maximum operational safety and risk diversification through four separate cooling circuits. Each circuit has an inverter-controlled TOSHIBA twin rotary compressor and two refrigerant air heat exchangers – two circuits share one refrigerant water heat exchanger.
However, it does not always have to be the dramatic failure of a circuit – after all, the everyday work of a heat pump or refrigeration machine also includes defrosting in heating mode or periodic maintenance of the devices.

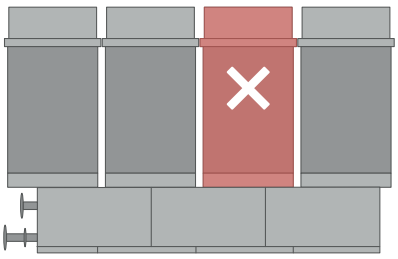
A USX system also reacts confidently in these standard situations: the defrosting operation takes place alternately – only the currently defrosting circuit is set, the remaining three circuits of a module continue to produce hot water (continuous heating). This eliminates the need for an additional buffer tank.



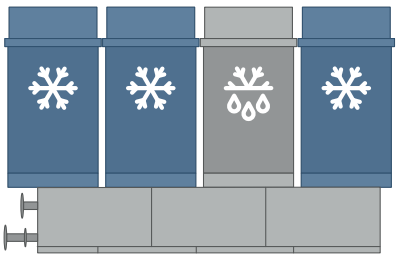
Only a small part of the overall system is temporarily out of service for the duration of the maintenance work. This is unique to TOSHIBA.



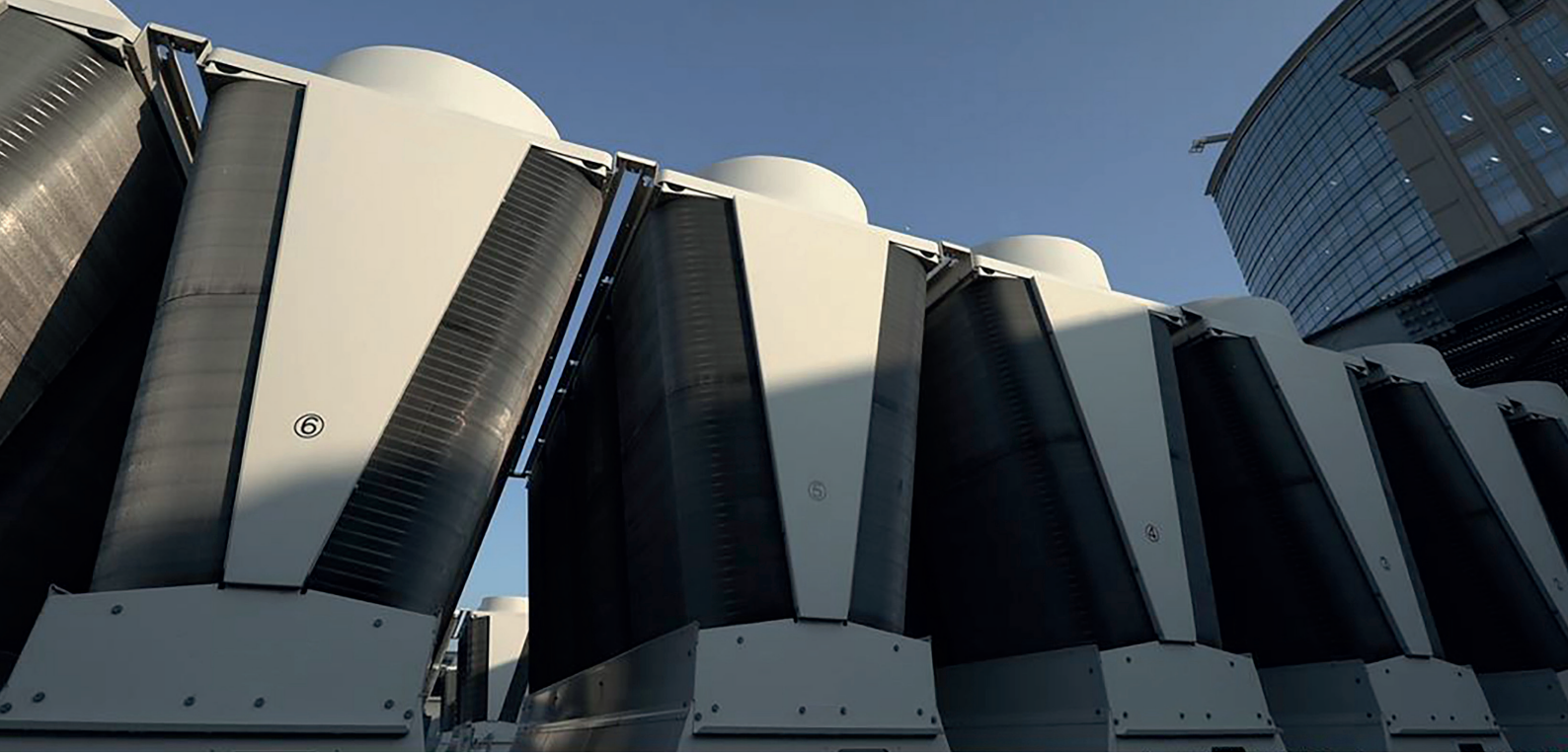





perfect back-up



continuous heating

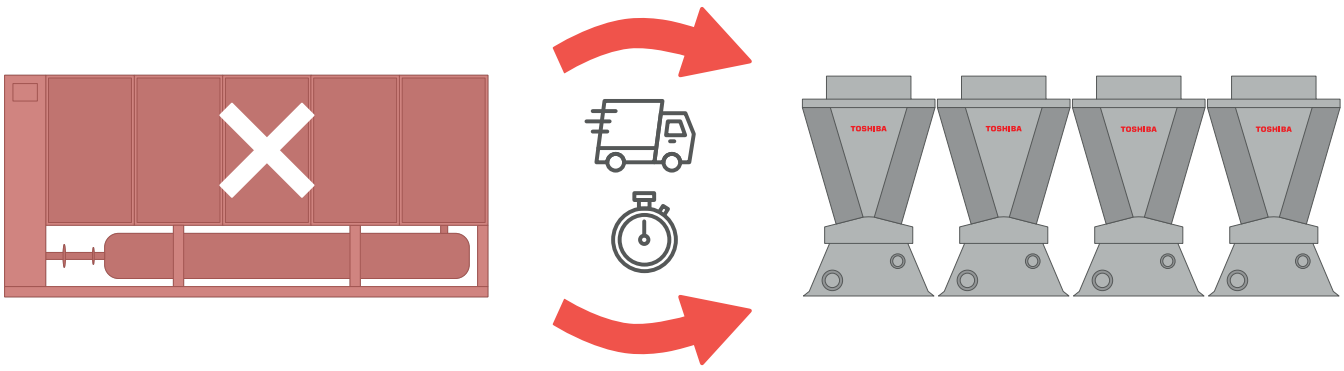


Feature 4

## ALL YEAR PROMPT DELIVERABLE FROM VIENNA WAREHOUSE

Standardized device configuration guarantees all year availability from warehouse Vienna

Conventional heat pump chillers often suffer from an oversupply of configuration options.
In practice, this leads to complex and lengthy configuration and delivery processes.
TOSHIBAs Chiller & Heatpump UNIVERSAL SMART X introduces a completely new concept to the market for the first time:
**Selected, standardized preconfigurations**, which meet the needs of the customers, enable **permanent storage** and **fastest delivery**. Even with spare parts!
All of this from stock in Vienna – without restrictions such as factory holidays in the high season.
Of course, special designs with options and extensive accessories are also possible on request. TOSHIBA also serves this classic built-to-order concept with moderate delivery times.
The unique product concept allows an existing heat pump chiller system to be exchanged – e.g. in the event of a total failure – within a few working days, and all without an expensive rental refrigeration system.



Feature 5

# 150 KW – 25,6 MW PERFORMANCE RANGE SCALED MODULAR

System performance heating and cooling
up to 25.600 kW modular combined

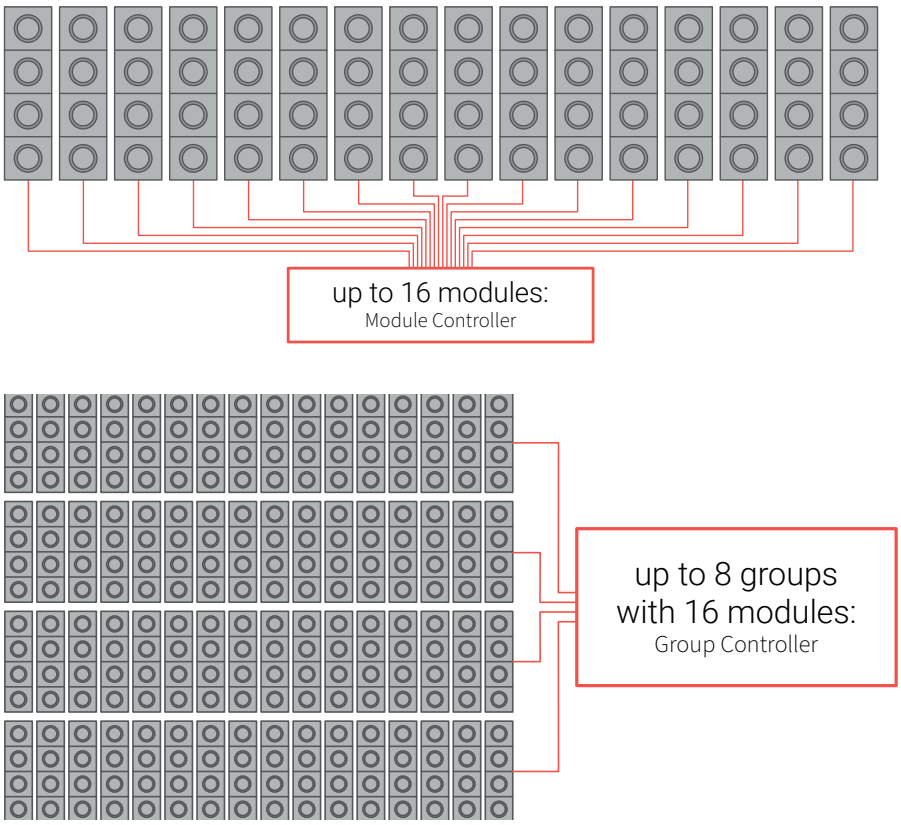
The modular combinability allows you maximum flexibility in planning, operation and, if necessary, expansion.

Thanks to the highly efficient inverter technology, small outputs in the partial load range and large outputs in the megawatt range can be achieved under extreme conditions. Regardless of whether you use a single module with 150 kW nominal capacity or a combination of modules with several megawatts – the clever controller system has every combination under control. And you can reduce costs with only three possible control devices:

**The Unit Controller (UC):**
It is included as standard in every single module and optimizes the four refrigeration circuits by controlling the inverter compressor. It also ensures that the water outlet temperature reaches the preset temperature and controls the integrated inverter water pump.

**The Module Controller (MC):**
It is an optional control device and can manage the unit controllers of a group of up to 16 modules.

**The Group Controller (GC):**
It is also an optional control device and can manage up to 8 groups with their associated module controllers.

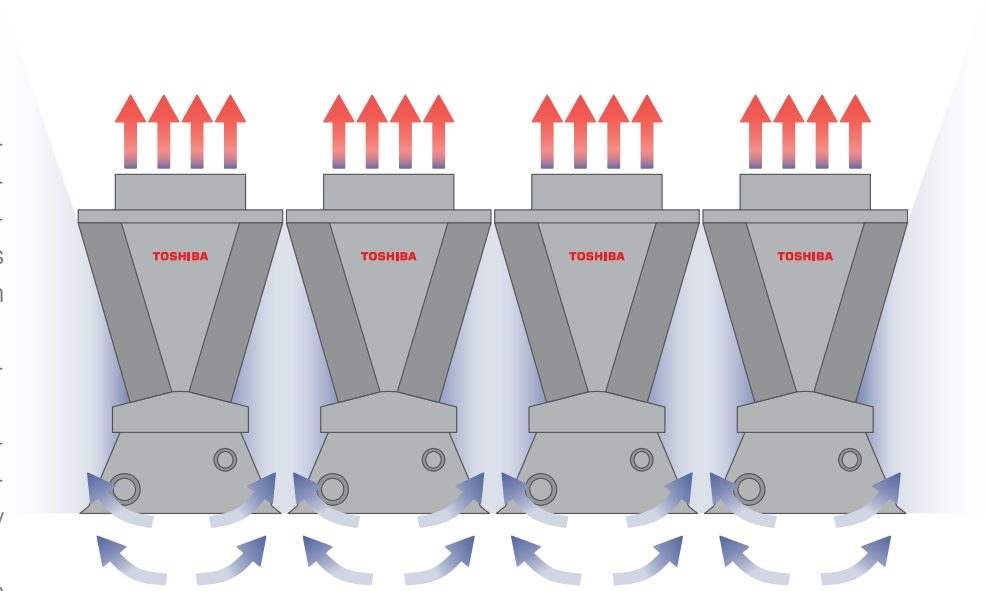


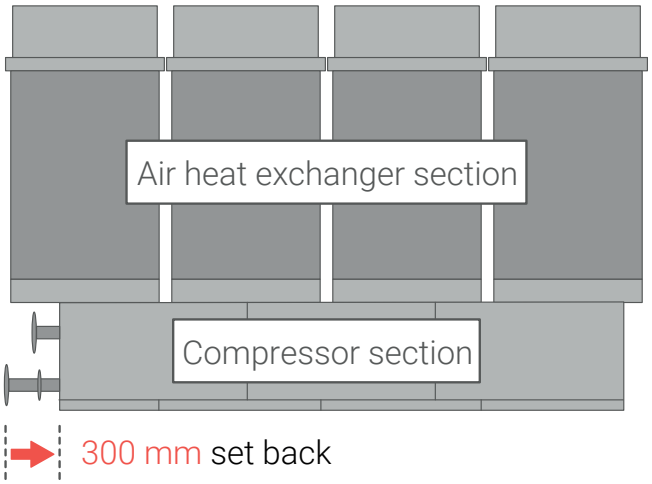
Feature 6

# SPACE SAVING X-FRAME CHASSIS DESIGN

The striking X-design optimizes the airflow and requires a smaller installation area than conventional systems

Space saving = cost reduction
The patented X-design covers several components with its development: it enables a seamless installation of individual devices as well as the highly efficient air flow between them.
The distance to walls and other objects can thus be kept small.
Easy access to maintenance-relevant components, such as the compressor unit, is also guaranteed by the intelligent design.
A hydraulic group with inverter pump is ready for connection and integrated in the compressor section to save space.
The water connections, which are set back due to the striking X-design, also contribute to effective space management.
The offset of the compressor section by 300 mm compared to the heat exchanger section brings space advantages when modules are arranged in parallel.



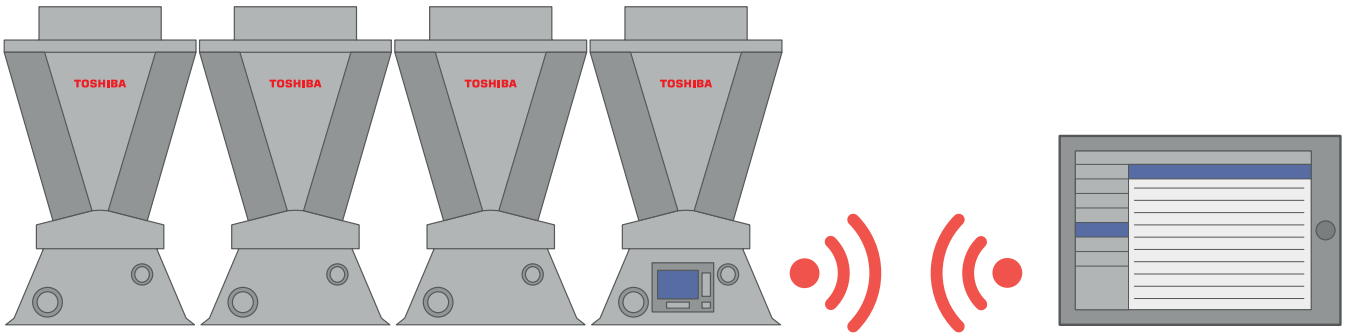
Feature 7

## WIFI CONNECTIVITY

Mobile system & energy monitoring via a simple app

The USX Flash Monitor System works with a WIFI SD card in the chiller module, which communicates with the corresponding APP in an Android tablet.
This tool is all about the simplest commissioning and transparent data management.

Some examples:
- Display of the operating times for all components
- Calculation of the required amount of water
- Display & history of error codes
- Definition of maintenance cycles for compressors, fans and pumps
- Real-time data display for all working pressures and temperatures
- Comparison of live data and saved data
- Clear trend graphics for the operating values
- Display of pressures and temperatures in the animated cooling circuit
- System reports with export function




MODULE CONTROLLER

Tablet or Laptop

Feature

8

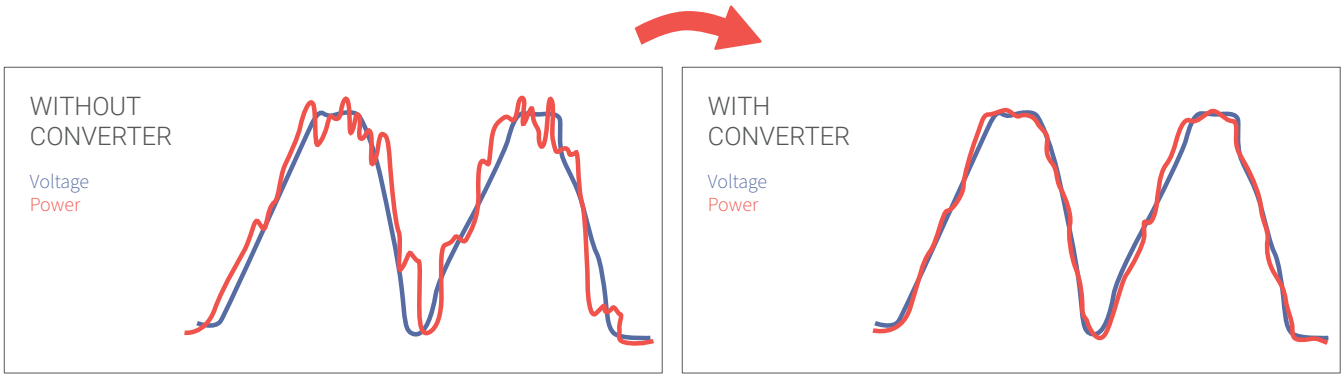
# HIGH ELECTRIC POWER FACTOR

Lower investing and operating costs due to standard reduction of the electrical connection power

The USX benefits from the suppression of harmonics through its PWM converter:
The TOSHIBA system can work extremely energy-efficiently with a power factor of 99 % thanks to a reduced operating current.

This relatively complex issue gives you three concrete advantages:

1. Cost savings during installation
   The electrical system for supply (cable cross-section & safety devices) can be dimensioned smaller.
2. Cost savings in configuration
   There are no additional costs for the use of active noice filters.
3. Cost savings in operation
   The high active power factor cos φ reduces the power consumption during operation.



# KEY WINNING POINTS

## For applications in INDUSTRIES

| USX key points for proposition | Customer's requirement |
|---|---|
| High efficiency at full and part load conditions to reduce the running costs and pay back term. | High energy efficiency for continuous operation and process cooling for all seasons. |
| Risk diversification thanks to the USX's "module-in module" design. | Importance of risk diversification for both air conditioner systems and process cooling for 24/7 operation. |
| Wide operating range (LWT -15°C ~ 55°C).<br>Accurate control of leaving water temperature due to the inverter-controlled water pump. | Wide operating range allows the USX to be used for various applications such as process line, clean room etc. |
| PWM converter is standard.<br>The modules unique design and small footprint makes for an easy installation compared to other brands. | Reducing the amount of peripheral equipment required.<br>Reducing the overall footprint of the heat source. |

## For applications in OFFICES, HOTELS & HOSPITALS

| USX key points for proposition | Customer's requirement |
|---|---|
| High efficiency at full load conditions for air conditioner systems. Best in its class for energy efficiency for both Standard and High EER models. | High energy efficiency for the air conditioner for all seasons. Need to satisfy all the building code projects. |
| Risk diversification thanks to the USX's "module-in module" design. | Importance of risk diversification for both air conditioner systems and process cooling for 24/7 operation. |
| Ability to produce cold & hot water simultaneously with combined Heatpump & Cooling Only systems. | System needs to produce cold & hot water for common air conditioning and heating applications. |
| Size and weight reduced due to the modules unique design brings flexibility for installation plans. | The need for an easy installation due to being in a busy city area.<br>Cost savings for installation (crane costs, etc.) |

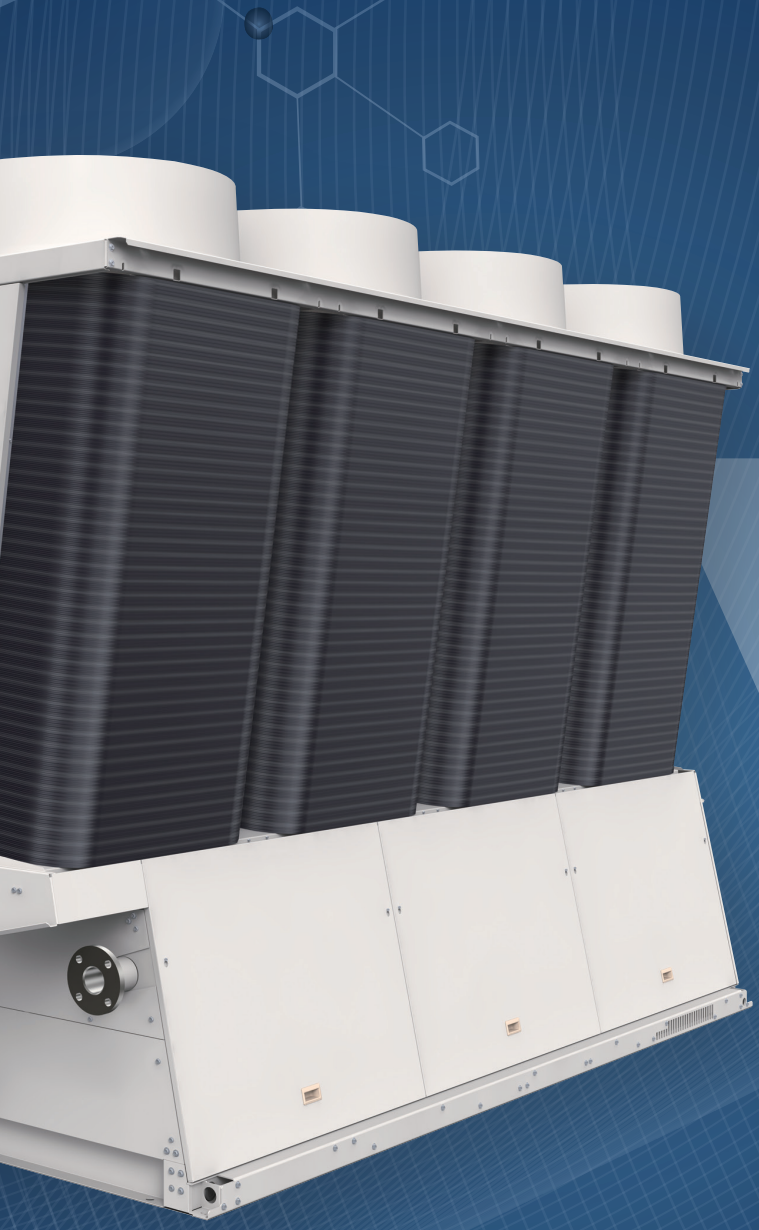
TOSHIBA

AIR-COND INTERNATIONAL

200 kW
Cooling only
Brine Model
Integr. Pump 3,7 kW
**RUAGP561C3R8E**


200 kW
Cooling only
Water & Brine Model
Integr. Pump 2,2 kW
**RUAGP561C28E**

# STOCK MODELS



150 kW
Heating & Cooling
Water & Brine Model
HiHeating Capacity
Integr. Pump 2,2 kW
**RUAGP421F28E**

180 kW
Heating & Cooling
Water & Brine Model
HiHeating Capacity
Integr. Pump 2,2 kW
**RUAGP511F28E**

TOSHIBA

# 200 KW COOLING ONLY – BRINE, 3,7 KW PUMP

## Type RUAGP561C3R8E stock model


USX Chiller constructed as universal cold water generator with highest operational and fail-safe reliability. The compact X-design with unique 4-in-1 module concept delivers outstanding Smart Features.

- Wide operation range ✔
- 150 kW – 25,6 MW performance range scaled modular ✔
- Twin rotary compressor – stepless controlled 5 – 100 % ✔
- space saving X-frame chassis design ✔
- Operational reliability by modular design ✔
- WIFI connectivity ✔
- All year prompt deliverable from Vienna warehouse ✔
- High electric power factor ✔
- Environmentally friendly refrigerant R32 ✔
- High energy efficiency ✔
- Continuous heating ✔
- Auto Back-Up function ✔

→ Performance Code 70 HP / 200 kW
Integrated 3,7 kW pump
Basic EER
LWT -15 ~ 30°C

# TECHNICAL KEY FACTS

- Air-cooled Chiller in a modular compact design
- Flexibility through modular combinability up to 25.600 kW
- Wide operating range down to -25°C or up to +52°C outdoor temperature
- Redundancy through 4 indepedent separate refrigeration circuits
- Optimal operational safety thanks to 4x TOSHIBA R32 inverter twin rotary compressors
- 4x inverter axial fan
- Best efficiency through stepless inverter control down to 5 % nominal capacity
- Soft start for low starting current
- Space-saving X-design
- Electronic expansion valves (PMV)
- 8x Air/R32 high efficiency heat exchangers
- 2x R32/Water high-efficiency heat exchangers
- 2x flange connection PN16
- 1x flanged dirt trap
- 2x temperature sensor
- Unit-Controller UC
- PWM converter for high electrical power factor and reduction of electrical connected load
- Electrical control cabinet
- Condensate tray heating
- Case heating
- Oil sump heating
- Frost protection thermocouple
- Mobile system- and energy-monitoring via an APP and WIFI, including non-stop operation recording
- Silent version

- Minus cooling down to -15°C leaving water temperature possible
- Brine/water mixture as energy source

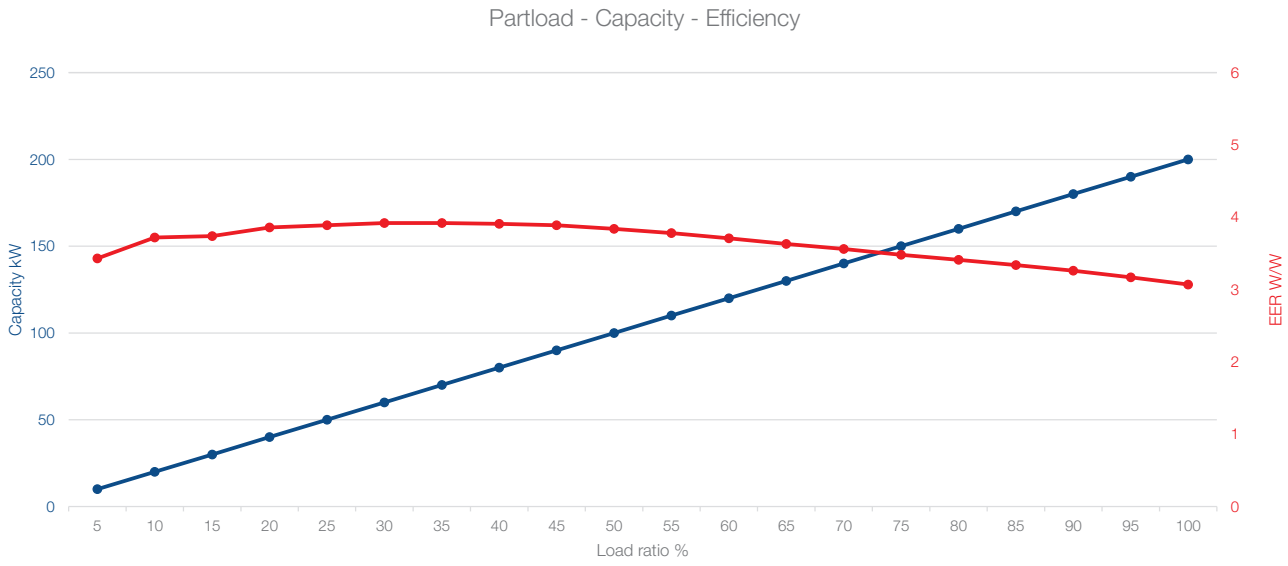
## Fits best for

- ☑ Industry
- ☑ Process Cooling
- ☑ Air Handling Units for dehumidification
- ☑ Hospitals

# 200 KW COOLING ONLY – BRINE, 3,7 KW PUMP

| Specified conditions | | | |
|---|---|---|---|
| **AMBIENT CONDITIONS** | | | |
| Outside Air | ❄ | 35 | °C DB |
| Outlet Water | ❄ | 7 | °C |
| Inlet Water | ❄ | 12 | °C |
| **CAPACITY CHARACTERISTICS** | | | |
| Cooling capacity | ❄ | 200 | kW |
| Max. cooling capacity | ❄ | 206 | kW |
| **EFFICIENCY** | | | |
| SEER | ❄ | 4,75 | W/W |
| EER | ❄ | 3,07 | W/W |
| **ELECTRIC CHARACTERISITICS** | | | |
| Power supply[2, 3] | | 380 - 400 / 3 / 50 | V / Ph+N / Hz |
| Operation current[2, 3] | | 95,0 | A |
| Power consumption[2, 3] | | 65,1 | kW |
| Power factor[2, 3] | | 99 | % |
| **FLUID CHARACTERISTICS** | | | |
| Flow rate range[2] | | 150 to 650 | L/min |
| Flow rate[2] | | 631 | L/min |
| Pressure drop[2] | | 163 | kPa |
| External pressure[2] | | 74,2 | kPa |
| Minimum holing water in system | | 1.581 | L |

[1]) „Integrated heating capcity“ represents the capacity including effects of frosting and defrosting.
[2]) These are characteristics under specified conditions.
[3]) The integrated pump part is not included in the electric characteristics.




| Load Ratio % | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity kW | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 |
| EER W/W | 3,43 | 3,72 | 3,74 | 3,86 | 3,89 | 3,92 | 3,92 | 3,91 | 3,89 | 3,84 | 3,78 | 3,71 | 3,63 | 3,56 | 3,48 | 3,41 | 3,34 | 3,26 | 3,17 | 3,07 |

# Type RUAGP561C3R8E stock model

| Integrated pump specs | | |
|---|---|---|
| Rated output | 3,7 | kW |
| Pumping system | Centrifugal Pump | |
| Starting method | Inverter | |
| Flow control system | Inverter | |
| Max. operation current | 6,9 x 1 | A |
| Max. power consumption | 4,5 x 1 | kW |

| Sound pressure level (Measurement position: 1.0 m distance, 1.5 m height) | | |
|---|---|---|
| Control-box side | 69,7 | dB(A) |
| Air heat-exchanger side | 74,0 | dB(A) |
| Water piping side | 68,6 | dB(A) |

| Sound power level | | |
|---|---|---|
| Single module | 90,9 | dB(A) |
| Overall system | 90,9 | dB(A) |

| Physical Data of Air-Cooled Chiller | | | |
|---|---|---|---|
| Dimensions | 2.350 | mm | Height |
| | 1.000 | mm | Width |
| | 3.300 | mm | Depth |
| Shipping Weight | 1.337 x 1 | kg | |
| Compressor | Twin Rotary x 4 | | Type / Pieces |
| | 13,2 x 4 | kW | Motor Output |
| | Inverter | | Type of Start |
| | 37 x 4 | W | Comp. Heater Wattage |
| Condenser Coil - Air Side | Plate Fin Coil x 8 | | |
| Fan unit | Propeller Fan x 4 | | Fan / Pieces |
| | 1.230 at max. | $m^3$/min | Air Quantity |
| | 1,2 x 4 | kW | Motor Output |
| Cooler - Water side | Brazed Plate Type x 2 | | |
| Refrigerant | 8,8 x 4 | kg | R32 Charge |
| | Electric Expansion Valve | | Control |
| Capacity Control Steps | 0, 4 ~ 100 (Stepless) | % | |
| Operation Control Process | | Microprocessor control based on leaving water temperature and water temperature difference | |
| Operating Limit - LWT | -15 ~ 30 | °C | |
| Operating Limit - OAT | -15 ~ 52 DB | °C | |
| Water Inlet Connection | 3“ Flange x 1 | inch | |
| Water Outlet Connection | 3“ Flange x 1 | inch | |

TOSHIBA

# 200 KW COOLING ONLY – WATER / BRINE, 2,2 KW PUMP

## Type RUAGP561C28E stock model


USX Chiller constructed as universal cold water generator with highest operational and fail-safe reliability. The compact X-design with unique 4-in-1 module concept delivers outstanding Smart Features.

- Wide operation range ✓
- 150 kW – 25,6 MW performance range scaled modular ✓
- Twin rotary compressor – stepless controlled 5 – 100 % ✓
- space saving X-frame chassis design ✓
- Operational reliability by modular design ✓
- WIFI connectivity ✓
- All year prompt deliverable from Vienna warehouse ✓
- High electric power factor ✓
- Environmentally friendly refrigerant R32 ✓
- High energy efficiency ✓
- Continuous heating ✓
- Auto Back-Up function ✓

→ Performance Code 70 HP / 200 kW
Integrated 2,2 kW pump
Basic EER
LWT 4 ~ 30°C

# TECHNICAL KEY FACTS

- Air-cooled Chiller in a modular compact design
- Flexibility through modular combinability up to 25.600 kW
- Wide operating range down to -25°C or up to +52°C outdoor temperature
- Redundancy through 4 indepedent separate refrigeration circuits
- Optimal operational safety thanks to 4x TOSHIBA R32 inverter twin rotary compressors
- 4x inverter axial fan
- Best efficiency through stepless inverter control down to 5 % nominal capacity
- Soft start for low starting current
- Space-saving X-design
- Electronic expansion valves (PMV)
- 8x Air/R32 high efficiency heat exchangers
- 2x R32/Water high-efficiency heat exchangers
- 2x flange connection PN16
- 1x flanged dirt trap
- 2x temperature sensor
- Unit-Controller UC
- PWM converter for high electrical power factor and reduction of electrical connected load
- Electrical control cabinet
- Condensate tray heating
- Case heating
- Oil sump heating
- Frost protection thermocouple
- Mobile system- and energy-monitoring via an APP and WIFI, including non-stop operation recording
- Silent version

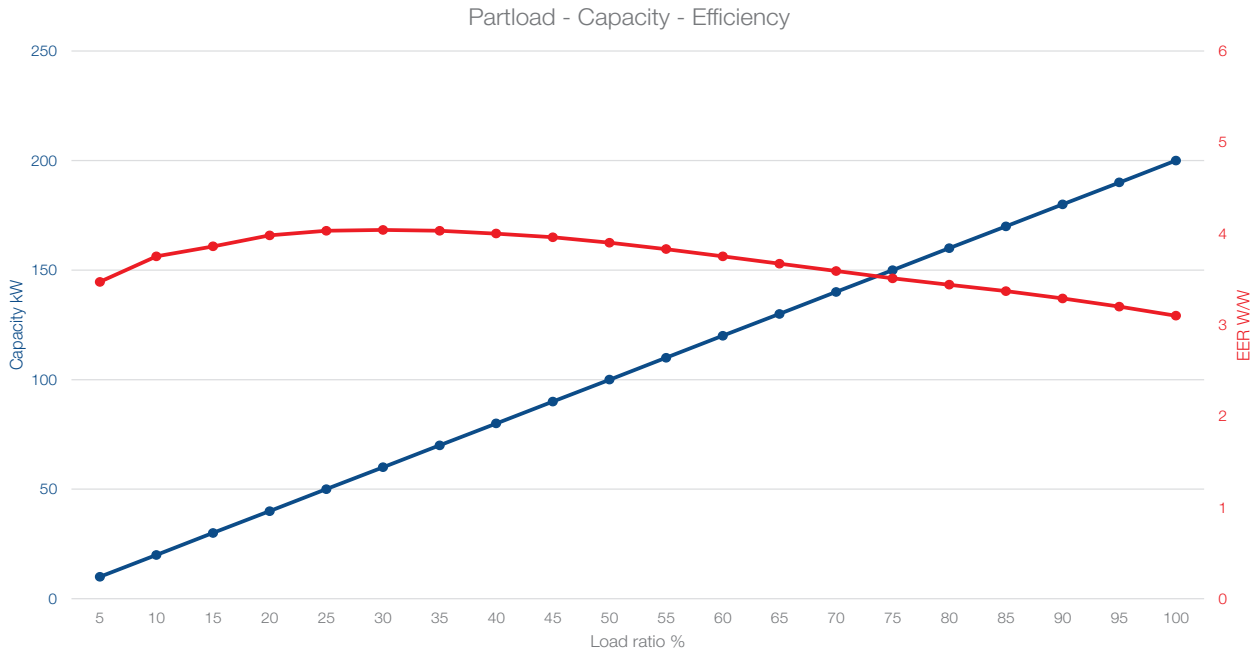
## Fits best for

- ☑ Air Handling Units for dehumidification
- ☑ Offices
- ☑ Hotels
- ☑ Hospitals
- ☑ Technical Servers
- ☑ Technical Cooling
- ☑ Shopping Centers

# 200 KW COOLING ONLY – WATER / BRINE, 2,2 KW PUMP

| Specified conditions | | | |
|---|---|---|---|
| **AMBIENT CONDITIONS** | | | |
| Outside Air | ❄ | 35 | °C DB |
| Outlet Water | ❄ | 7 | °C |
| Inlet Water | ❄ | 12 | °C |
| **CAPACITY CHARACTERISTICS** | | | |
| Cooling capacity | ❄ | 200 | kW |
| Max. cooling capacity | ❄ | 207 | kW |
| **EFFICIENCY** | | | |
| SEER | ❄ | 4,75 | W/W |
| EER | ❄ | 3,10 | W/W |
| **ELECTRIC CHARACTERISITICS** | | | |
| Power supply[2, 3] | | 380 - 400 / 3 / 50 | V / Ph+N / Hz |
| Operation current[2, 3] | | 94,1 | A |
| Power consumption[2, 3] | | 64,5 | kW |
| Power factor[2, 3] | | 99 | % |
| **FLUID CHARACTERISTICS** | | | |
| Flow rate range[2] | | 150 to 650 | L/min |
| Flow rate[2] | | 573 | L/min |
| Pressure drop[2] | | 95,9 | kPa |
| External pressure[2] | | 65,0 | kPa |
| Minimum holing water in system | | 1.434 | L |

[1]) „Integrated heating capcity“ represents the capacity including effects of frosting and defrosting.
[2]) These are characteristics under specified conditions.
[3]) The integrated pump part is not included in the electric characteristics.




| Load Ratio % | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity kW | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 |
| EER W/W | 3,47 | 3,75 | 3,86 | 3,98 | 4,03 | 4,04 | 4,03 | 4,00 | 3,96 | 3,90 | 3,83 | 3,75 | 3,67 | 3,59 | 3,51 | 3,44 | 3,37 | 3,29 | 3,20 | 3,10 |

# Type RUAGP561C28E stock model

| Integrated pump specs | | |
|---|---|---|
| Rated output | 2,2 | kW |
| Pumping system | Centrifugal Pump | |
| Starting method | Inverter | |
| Flow control system | Inverter | |
| Max. operation current | 4,3 x 1 | A |
| Max. power consumption | 2,8 x 1 | kW |

| Sound pressure level (Measurement position: 1.0 m distance, 1.5 m height) | | |
|---|---|---|
| Control-box side | 69,7 | dB(A) |
| Air heat-exchanger side | 74,0 | dB(A) |
| Water piping side | 68,6 | dB(A) |

| Sound power level | | |
|---|---|---|
| Single module | 90,9 | dB(A) |
| Overall system | 90,9 | dB(A) |

| Physical Data of Air-Cooled Chiller | | | |
|---|---|---|---|
| Dimensions | 2.350 | mm | Height |
| | 1.000 | mm | Width |
| | 3.300 | mm | Depth |
| Shipping Weight | 1.318 x 1 | kg | |
| Compressor | Twin Rotary x 4 | | Type / Pieces |
| | 13,2 x 4 | kW | Motor Output |
| | Inverter | | Type of Start |
| | 37 x 4 | W | Comp. Heater Wattage |
| Condenser Coil - Air Side | Plate Fin Coil x 8 | | |
| Fan unit | Propeller Fan x 4 | | Fan / Pieces |
| | 1.230 at max. | $m^3$/min | Air Quantity |
| | 1,2 x 4 | kW | Motor Output |
| Cooler - Water side | Brazed Plate Type x 2 | | |
| Refrigerant | 8,8 x 4 | kg | R32 Charge |
| | Electric Expansion Valve | | Control |
| Capacity Control Steps | 0, 4 ~ 100 (Stepless) | % | |
| Operation Control Process | | Microprocessor control based on leaving water temperature and water temperature difference | |
| Operating Limit - LWT | 4 ~ 30 | °C | |
| Operating Limit - OAT | -15 ~ 52 DB | °C | |
| Water Inlet Connection | 3“ Flange x 1 | inch | |
| Water Outlet Connection | 3“ Flange x 1 | inch | |

TOSHIBA

# 150 KW HEATPUMP, HiHEATING – WATER / BRINE, 2,2 KW PUMP

## Type RUAGP421F28E stock model


USX Chiller constructed as universal cold and warm water generator with highest operational and fail-safe reliability. The compact X-design with unique 4-in-1 module concept delivers outstanding Smart Features.

- Wide operation range ✔
- 150 kW – 25,6 MW performance range scaled modular ✔
- Twin rotary compressor – stepless controlled 5 – 100 % ✔
- space saving X-frame chassis design ✔
- Operational reliability by modular design ✔
- WIFI connectivity ✔
- All year prompt deliverable from Vienna warehouse ✔
- High electric power factor ✔
- Environmentally friendly refrigerant R32 ✔
- High energy efficiency ✔
- Continuous heating ✔
- Auto Back-Up function ✔

→ Performance Code 50 HP / 150 kW
Integrated 2,2 kW pump
Basic EER
HiHeating Capacity
LWT 4 ~ 30°C
25 ~ 55°C

# TECHNICAL KEY FACTS

- Air-cooled Heatpump chiller in a modular compact design
- Flexibility through modular combinability up to 25.600 kW
- Wide operating range down to -25°C or up to +52°C outdoor temperature
- Redundancy through 4 indepedent separate refrigeration circuits
- Optimal operational safety thanks to 4x TOSHIBA R32 inverter twin rotary compressors
- 4x inverter axial fan
- Best efficiency through stepless inverter control down to 5 % nominal capacity
- Soft start for low starting current
- Space-saving X-design
- Electronic expansion valves (PMV)
- 8x Air/R32 high efficiency heat exchangers
- 2x R32/Water high-efficiency heat exchangers
- 2x flange connection PN16
- 1x flanged dirt trap
- 2x temperature sensor
- Unit-Controller UC
- PWM converter for high electrical power factor and reduction of electrical connected load
- Electrical control cabinet
- Condensate tray heating
- Case heating
- Oil sump heating
- Frost protection thermocouple
- Mobile system- and energy-monitoring via an APP and WIFI, including non-stop operation recording
- Silent version

- Optimised for heating operation at lowest outdoor temperatures down to -25°C
- Leaving water temperature up to +55°C
- With r.H. sensor for optimizing the defrost cycles

## Fits best for

- ☑ Air Handling Units for dehumidification
- ☑ Offices
- ☑ Hotels
- ☑ Hospitals
- ☑ Shopping Centers

# 150 KW HEATPUMP, HiHEATING – WATER / BRINE, 2,2 KW PUMP

| Specified conditions | | | |
|---|---|---|---|
| **AMBIENT CONDITIONS** | | | |
| Outside Air | ❄ | 35 | °C DB |
| Outlet Water | ❄ | 7 | °C |
| Inlet Water | ❄ | 12 | °C |
| Outside Air | ☀ | 7 | °C DB |
| Outside Air WB | ☀ | 6 | °C WB |
| Outlet Water | ☀ | 35 | °C |
| Inlet Water | ☀ | 30 | °C |
| **CAPACITY CHARACTERISTICS** | | | |
| Cooling capacity | ❄ | 150 | kW |
| Max. cooling capacity | ❄ | 165 | kW |
| Heating capacity | ☀ | 150 | kW |
| Integrated heating capacity[1] | ☀ | 150 | kW |
| Max. heating capacity | ☀ | 175 | kW |
| **EFFICIENCY** | | | |
| SEER | ❄ | 4,88 | W/W |
| SCOP | ☀ | 4,26 | W/W |
| EER | ❄ | 3,53 | W/W |
| COP | ☀ | 4,53 | W/W |
| **ELECTRIC CHARACTERISITICS** | | | |
| Power supply[2, 3] | | 380 - 400 / 3 / 50 | V / Ph+N / Hz |
| Operation current[2, 3] | | 62,0 | A |
| | | 48,3 | A |
| Power consumption[2, 3] | | 42,5 | kW |
| | | 33,1 | kW |
| Power factor[2, 3] | | 99 | % |
| | | 99 | % |
| **FLUID CHARACTERISTICS** | | | |
| Flow rate range[2] | | 150 to 600 | L/min |
| Flow rate[2] | | 430 | L/min |
| | | 430 | L/min |
| Pressure drop[2] | | 56,1 | kPa |
| | | 56,1 | kPa |
| External pressure[2] | | 127 | kPa |
| | | 127 | kPa |
| Minimum holing water in system | | 1.075 | L |

[1]) „Integrated heating capcity“ represents the capacity including effects of frosting and defrosting.
[2]) These are characteristics under specified conditions.
[3]) The integrated pump part is not included in the electric characteristics.

# Type RUAGP421F28E stock model

| Integrated pump specs | | |
|---|---|---|
| Rated output | 2.2 | kW |
| Pumping system | Centrifugal Pump | |
| Starting method | Inverter | |
| Flow control system | Inverter | |
| Max. operation current | 4,3 x 1 | A |
| Max. power consumption | 2,8 x 1 | kW |

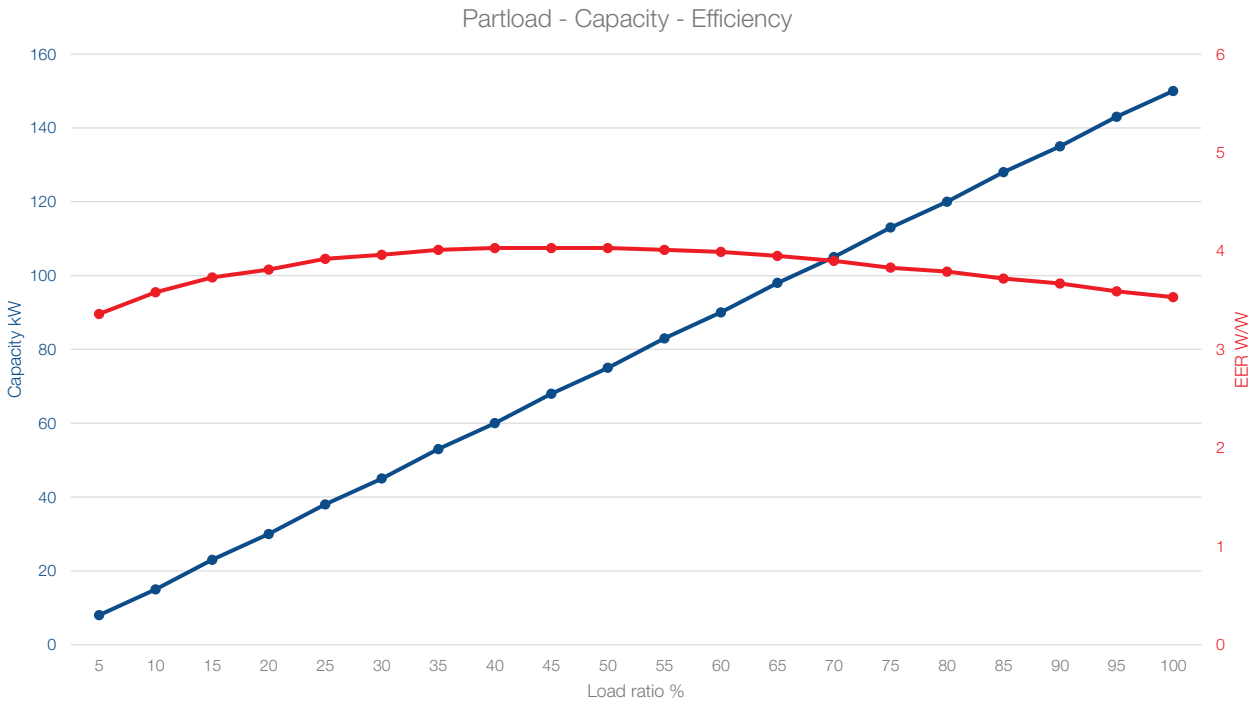
| Sound pressure level (Measurement position: 1.0 m distance, 1.5 m height) | | |
|---|---|---|
| Control-box side | 64,7 | dB(A) |
| Air heat-exchanger side | 69,1 | dB(A) |
| Water piping side | 65,9 | dB(A) |

| Sound power level | | |
|---|---|---|
| Single module | 83,8 | dB(A) |
| Overall system | 83,8 | dB(A) |

| Physical Data of Air-Cooled Chiller | | | |
|---|---|---|---|
| Dimensions | 2.350 | mm | Height |
| | 1.000 | mm | Width |
| | 3.300 | mm | Depth |
| Shipping Weight | 1.351 x 1 | kg | |
| Compressor | Twin Rotary x 4 | | Type / Pieces |
| | 9,0 x 4 | kW | Motor Output |
| | Inverter | | Type of Start |
| | 37 x 4 | W | Comp. Heater Wattage |
| Condenser Coil - Air Side | Plate Fin Coil x 8 | | |
| Fan unit | Propeller Fan x 4 | | Fan / Pieces |
| | 1.230 at max. | $m^3$/min | Air Quantity |
| | 1,2 x 4 | kW | Motor Output |
| Cooler - Water side | Brazed Plate Type x 2 | | |
| Refrigerant | 8,8 x 4 | kg | R32 Charge |
| | Electric Expansion Valve | | Control |
| Capacity Control Steps | 0,5 ~ 100 (Stepless) | % | |
| Operation Control Process | | Microprocessor control based on leaving water temperature and water temperature difference | |
| Operating Limit - LWT | 4 ~ 30 | °C | ❄ |
| Operating Limit - LWT | 25 ~ 55 | °C | ☀ |
| Operating Limit - OAT | -15 ~ 52 DB | °C | ❄ |
| Operating Limit - OAT | -15 ~ 21 DB | °C | ☀ |
| Water Inlet Connection | 2-1/2“ Flange x 1 | | |
| Water Outlet Connection | 2-1/2“ Flange x 1 | | |

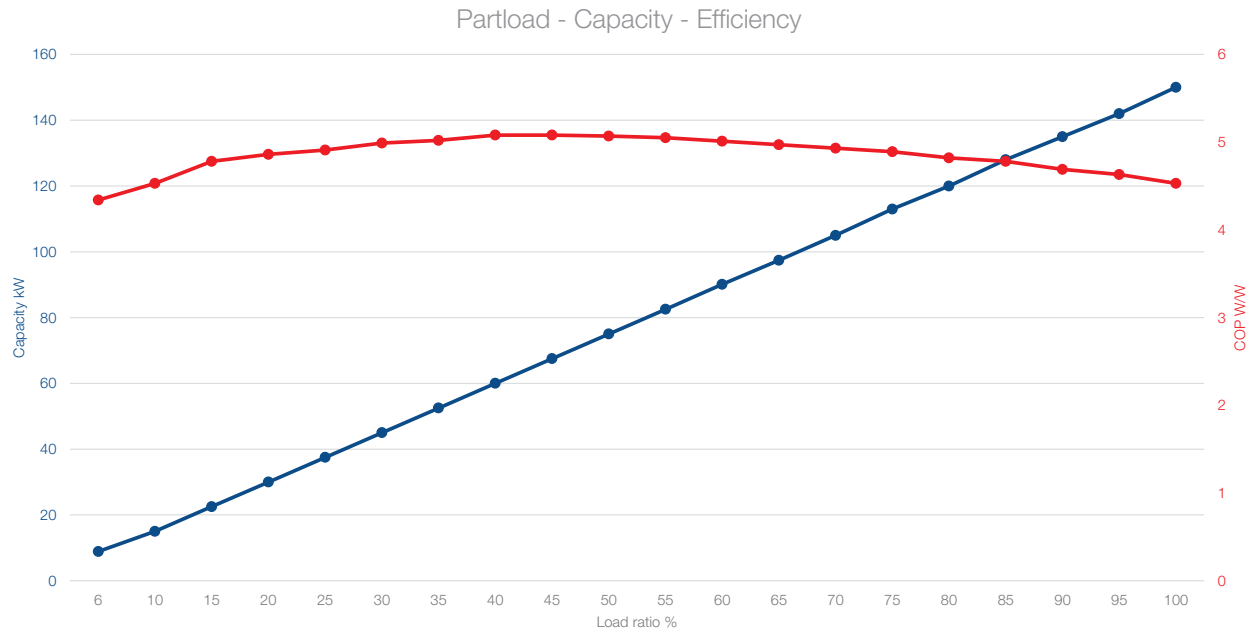
TOSHIBA

# COOLING




| Load Ratio % | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity kW | 8 | 15 | 23 | 30 | 38 | 45 | 53 | 60 | 68 | 75 | 83 | 90 | 98 | 105 | 113 | 120 | 128 | 135 | 143 | 150 |
| EER W/W | 3,36 | 3,58 | 3,73 | 3,81 | 3,92 | 3,96 | 4,01 | 4,03 | 4,03 | 4,03 | 4,01 | 3,99 | 3,95 | 3,90 | 3,83 | 3,79 | 3,72 | 3,67 | 3,59 | 3,53 |

# HEATING




| Load Ratio % | 6 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity kW | 9 | 15 | 23 | 30 | 38 | 45 | 53 | 60 | 68 | 75 | 83 | 90 | 97 | 105 | 113 | 120 | 128 | 135 | 142 | 150 |
| COP W/W | 4,34 | 4,53 | 4,78 | 4,86 | 4,91 | 4,99 | 5,02 | 5,08 | 5,08 | 5,07 | 5,05 | 5,01 | 4,97 | 4,93 | 4,89 | 4,82 | 4,78 | 4,69 | 4,63 | 4,53 |

TOSHIBA

# 180 KW HEATPUMP, HiHEATING – WATER / BRINE, 2,2 KW PUMP

## Type RUAGP511F28E stock model


USX Chiller constructed as universal cold and warm water generator with highest operational and fail-safe reliability. The compact X-design with unique 4-in-1 module concept delivers outstanding Smart Features.

- Wide operation range ✓
- 150 kW – 25,6 MW performance range scaled modular ✓
- Twin rotary compressor – stepless controlled 5 – 100 % ✓
- space saving X-frame chassis design ✓
- Operational reliability by modular design ✓
- WIFI connectivity ✓
- All year prompt deliverable from Vienna warehouse ✓
- High electric power factor ✓
- Environmentally friendly refrigerant R32 ✓
- High energy efficiency ✓
- Continuous heating ✓
- Auto Back-Up function ✓

→ Performance Code 60 HP / 180 kW
Integrated 2,2 kW pump
Basic EER
HiHeating Capacity
LWT 4 ~ 30°C
25 ~ 55°C

# TECHNICAL KEY FACTS

- Air-cooled Heatpump chiller in a modular compact design
- Flexibility through modular combinability up to 25.600 kW
- Wide operating range down to -25°C or up to +52°C outdoor temperature
- Redundancy through 4 indepedent separate refrigeration circuits
- Optimal operational safety thanks to 4x TOSHIBA R32 inverter twin rotary compressors
- 4x inverter axial fan
- Best efficiency through stepless inverter control down to 5 % nominal capacity
- Soft start for low starting current
- Space-saving X-design
- Electronic expansion valves (PMV)
- 8x Air/R32 high efficiency heat exchangers
- 2x R32/Water high-efficiency heat exchangers
- 2x flange connection PN16
- 1x flanged dirt trap
- 2x temperature sensor
- Unit-Controller UC
- PWM converter for high electrical power factor and reduction of electrical connected load
- Electrical control cabinet
- Condensate tray heating
- Case heating
- Oil sump heating
- Frost protection thermocouple
- Mobile system- and energy-monitoring via an APP and WIFI, including non-stop operation recording
- Silent version

- Optimised for heating operation at lowest outdoor temperatures down to -25°C
- Leaving water temperature up to +55°C
- With r.H. sensor for optimizing the defrost cycles

## Fits best for

- ☑ Air Handling Units for dehumidification
- ☑ Offices
- ☑ Hotels
- ☑ Hospitals
- ☑ Shopping Centers

# 180 KW HEATPUMP, HiHEATING – WATER / BRINE, 2,2 KW PUMP

| Specified conditions | | | |
|---|---|---|---|
| **AMBIENT CONDITIONS** | | | |
| Outside Air | ❄ | 35 | °C DB |
| Outlet Water | ❄ | 7 | °C |
| Inlet Water | ❄ | 12 | °C |
| Outside Air DB | ☀ | 7 | °C DB |
| Outside Air WB | ☀ | 6 | °C WB |
| Outlet Water | ☀ | 35 | °C |
| Inlet Water | ☀ | 30 | °C |
| **CAPACITY CHARACTERISTICS** | | | |
| Cooling capacity | ❄ | 180 | kW |
| Max. cooling capacity | ❄ | 192 | kW |
| Heating capacity | ☀ | 180 | kW |
| Integrated heating capacity[1] | ☀ | 180 | kW |
| Max. heating capacity | ☀ | 205 | kW |
| **EFFICIENCY** | | | |
| SEER | ❄ | 4,77 | W/W |
| SCOP | ☀ | 4,35 | W/W |
| EER | ❄ | 3,26 | W/W |
| COP | ☀ | 4,26 | W/W |
| **ELECTRIC CHARACTERISITICS** | | | |
| Power supply[2, 3] | | 380 - 400 / 3 / 50 | V / Ph+N / Hz |
| Operation current[2, 3] | | 80,5 | A |
| | | 61,6 | A |
| Power consumption[2, 3] | | 55,2 | kW |
| | | 42,3 | kW |
| Power factor[2, 3] | | 99 | % |
| | | 99 | % |
| **FLUID CHARACTERISTICS** | | | |
| Flow rate range[2] | | 150 to 600 | L/min |
| Flow rate[2] | | 516 | L/min |
| | | 516 | L/min |
| Pressure drop[2] | | 78,9 | kPa |
| | | 78,9 | kPa |
| External pressure[2] | | 92,2 | kPa |
| | | 92,2 | kPa |
| Minimum holing water in system | | 1.290 | L |

[1]) „Integrated heating capcity“ represents the capacity including effects of frosting and defrosting.
[2]) These are characteristics under specified conditions.
[3]) The integrated pump part is not included in the electric characteristics.

# Type RUAGP511F28E stock model

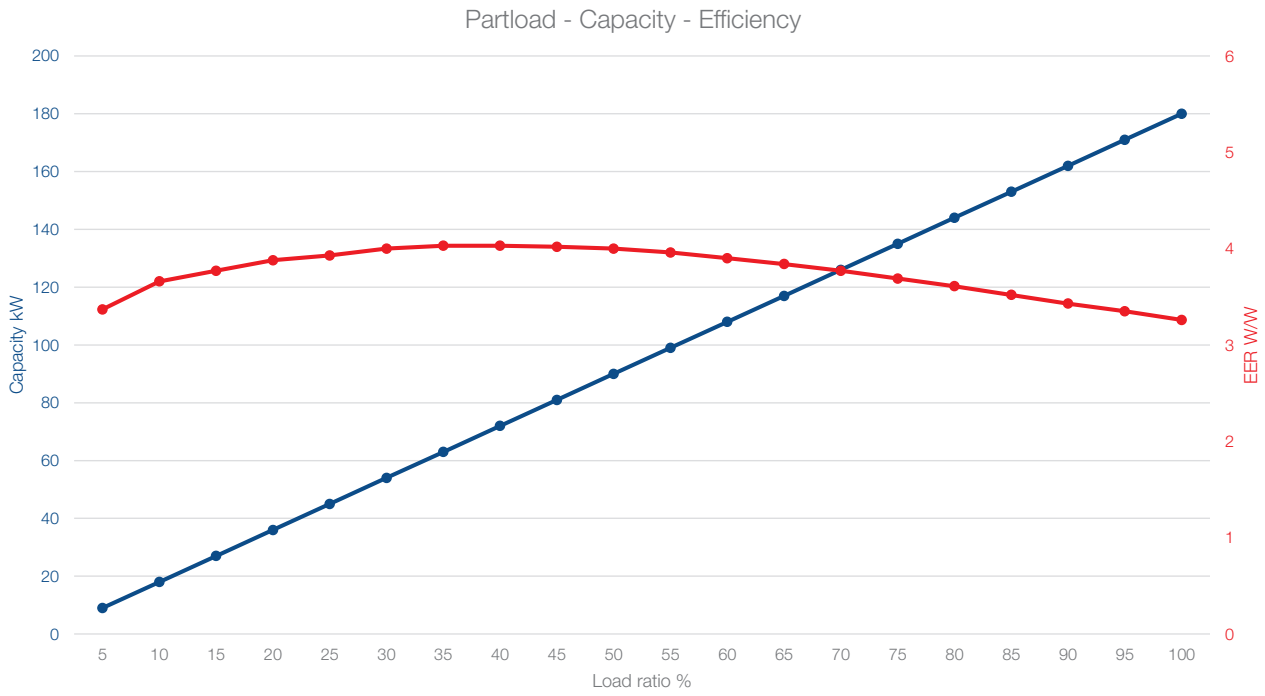
| Integrated pump specs | | |
|---|---|---|
| Rated output | 2.2 | kW |
| Pumping system | Centrifugal Pump | |
| Starting method | Inverter | |
| Flow control system | Inverter | |
| Max. operation current | 4,3 x 1 | A |
| Max. power consumption | 2,8 x 1 | kW |

| Sound pressure level (Measurement position: 1.0 m distance, 1.5 m height) | | |
|---|---|---|
| Control-box side | 68,2 | dB(A) |
| Air heat-exchanger side | 71,2 | dB(A) |
| Water piping side | 68,3 | dB(A) |

| Sound power level | | |
|---|---|---|
| Single module | 87,4 | dB(A) |
| Overall system | 87,4 | dB(A) |

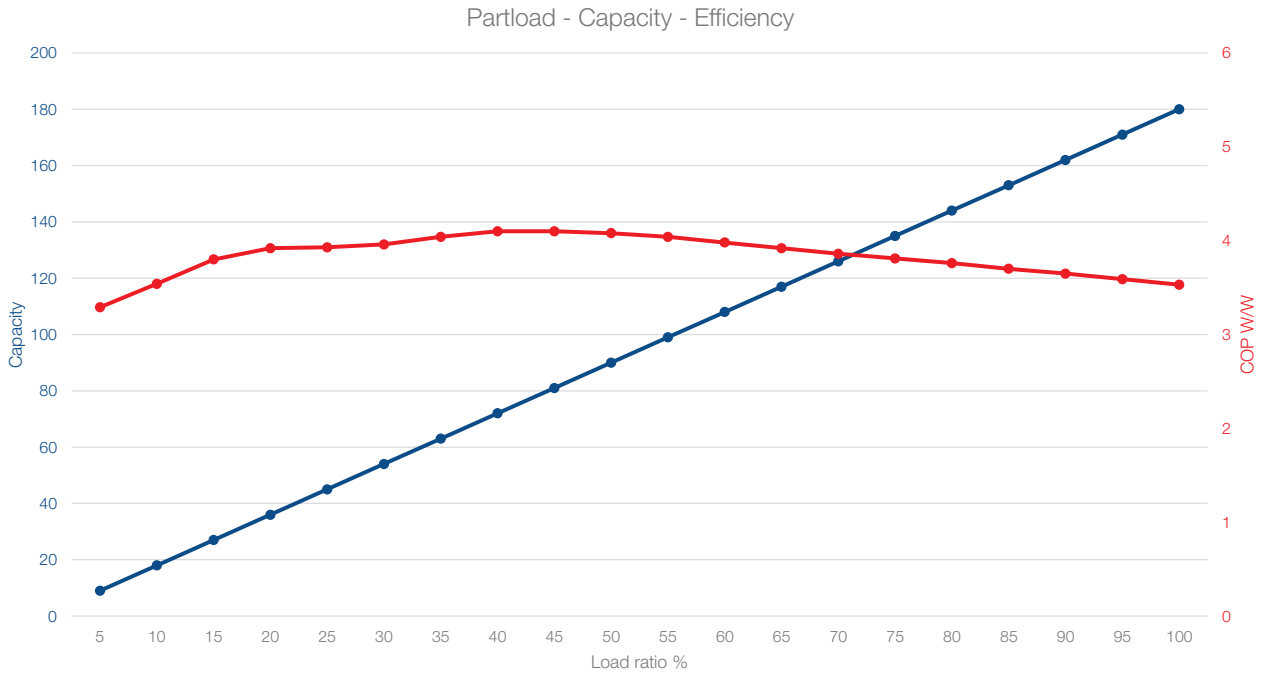
| Physical Data of Air-Cooled Chiller | | | |
|---|---|---|---|
| Dimensions | 2.350 | mm | Height |
| | 1.000 | mm | Width |
| | 3.300 | mm | Depth |
| Shipping Weight | 1.351 x 1 | kg | |
| Compressor | Twin Rotary x 4 | | Type / Pieces |
| | 11,2 x 4 | kW | Motor Output |
| | Inverter | | Type of Start |
| | 37 x 4 | W | Comp. Heater Wattage |
| Condenser Coil - Air Side | Plate Fin Coil x 8 | | |
| Fan unit | Propeller Fan x 4 | | Fan / Pieces |
| | 1.230 at max. | $m^3$/min | Air Quantity |
| | 1,2 x 4 | kW | Motor Output |
| Cooler - Water side | Brazed Plate Type x 2 | | |
| Refrigerant | 8,8 x 4 | kg | R32 Charge |
| | Electric Expansion Valve | | Control |
| Capacity Control Steps | 0,4 ~ 100 (Stepless) | % | |
| Operation Control Process | | Microprocessor control based on leaving water temperature and water temperature difference | |
| Operating Limit - LWT | 4 ~ 30 | °C | ❄ |
| Operating Limit - LWT | 25 ~ 55 | °C | ☀ |
| Operating Limit - OAT | -15 ~ 52 DB | °C | ❄ |
| Operating Limit - OAT | -15 ~ 21 DB | °C | ☀ |
| Water Inlet Connection | 2-1/2“ Flange x 1 | | |
| Water Outlet Connection | 2-1/2“ Flange x 1 | | |

# COOLING




| Load Ratio % | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity kW | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 | 117 | 126 | 135 | 144 | 153 | 162 | 171 | 180 |
| EER W/W | 3,37 | 3,66 | 3,77 | 3,88 | 3,93 | 4,00 | 4,03 | 4,03 | 4,02 | 4,00 | 3,96 | 3,90 | 3,84 | 3,77 | 3,69 | 3,61 | 3,52 | 3,43 | 3,35 | 3,26 |

# HEATING




| Load Ratio % | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity kW | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 | 117 | 126 | 135 | 144 | 153 | 162 | 171 | 180 |
| COP W/W | 4,39 | 4,70 | 4,93 | 5,03 | 5,09 | 5,16 | 5,19 | 5,20 | 5,19 | 5,15 | 5,08 | 4,99 | 4,91 | 4,82 | 4,73 | 4,63 | 4,53 | 4,44 | 4,35 | 4,26 |

TOSHIBA

# BEST PRACTICE


## TOSHIBA Carrier Cooperation global R&D Center “e-THIRD” in Japan

The innovative ideas of the global research and development of TOSHIBA Carrier are created at its R&D center in Fuji City. The company’s own USX ensures that employees can always enjoy a comfortable climate throughout the office building. The R&D center is a source of incisive inventions and developments on the market that contribute significantly to the well-being of people and the environment.

## Process Cooling in Japan

Sake is a traditional Japanese beverage and is brewed from polished rice. In order to make the production more efficient, the customer chose the TOSHIBA USX Chiller because it realizes stable operation all year round and immense cost reduction.

## Automotive Factory

The customer is an industrial company in the automotive manufacturing industry. The customer's original gas absorption chiller needed to be replaced after nearly 20 years of operation to save energy, easily control temperature, and reduce operating costs. Using the highly efficient USX reduced ongoing costs and provided risk diversification with a backup for each module.

## Clean room

A manufacturer of optical sensors, electric light sources and other optical devices built a new factory where 30 USX units provide optimal conditions. The cooling system in the factory requires chilled water for the manufacturing process and hot / chilled water for the cleanroom. Cleanrooms are environments that must be closely controlled. To minimize contamination risks and protect people and objects, their technological infrastructure must meet the strictest quality standards. With customized Chiller USX, TOSHIBA ensures that all environmental parameters are continuously met, adequately controlled, monitored and stored.

## Data Center in Okinawa

14 USXs provide stable 24-hour / 365-day operation at maximum efficiency in a data center in Okinawa. The inverter control ensures precise temperature regulation according to load changes. The use of the USX has drastically reduced energy costs for the entire building, and the modular design avoids shutdowns during maintenance.

## MARINA BAY SANDS

Singapore's most iconic hotel for the world's largest rooftop infinity pool, award-winning dining and a wide range of shopping and entertainment facilities trusts the reliability and quality of TOSHIBAs USX. The efficiency and failsafe of the USX contributes to the extraordinary performance of the hotel.

TOSHIBA AIR-COND INTERNATIONAL

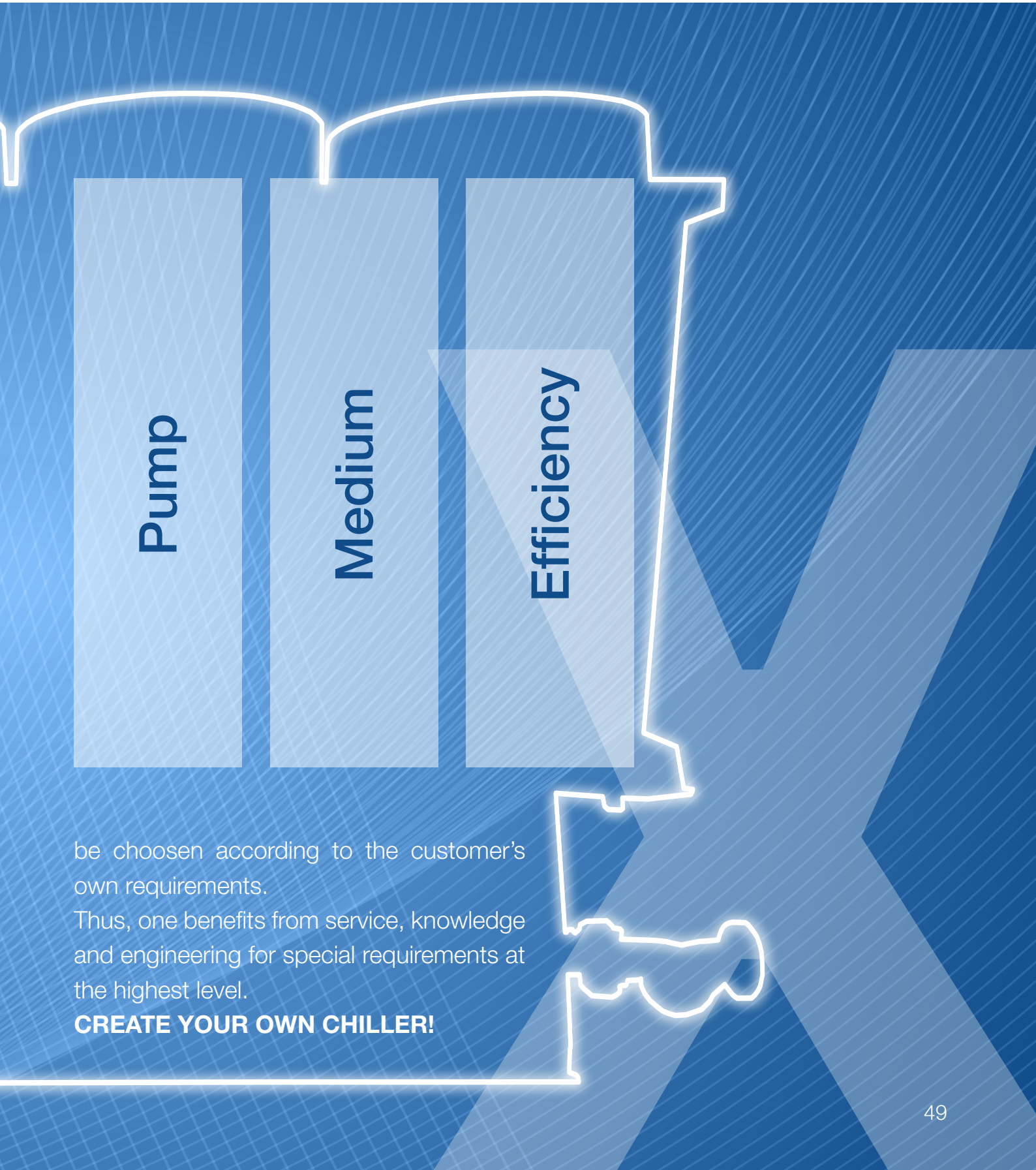
Module Capacity

Operation Mode

Heating Mode

Tailor-made – according to customer requirements! TOSHIBA offers significant advantages with tailor-made production.
The MODULE CAPACITY, OPERATING MODE, HEATING MODE, PUMP, MEDIUM and EFFICIENCY configuration blocks can

# TAILOR MADE MODELS




be choosen according to the customer's own requirements.
Thus, one benefits from service, knowledge and engineering for special requirements at the highest level.
**CREATE YOUR OWN CHILLER!**

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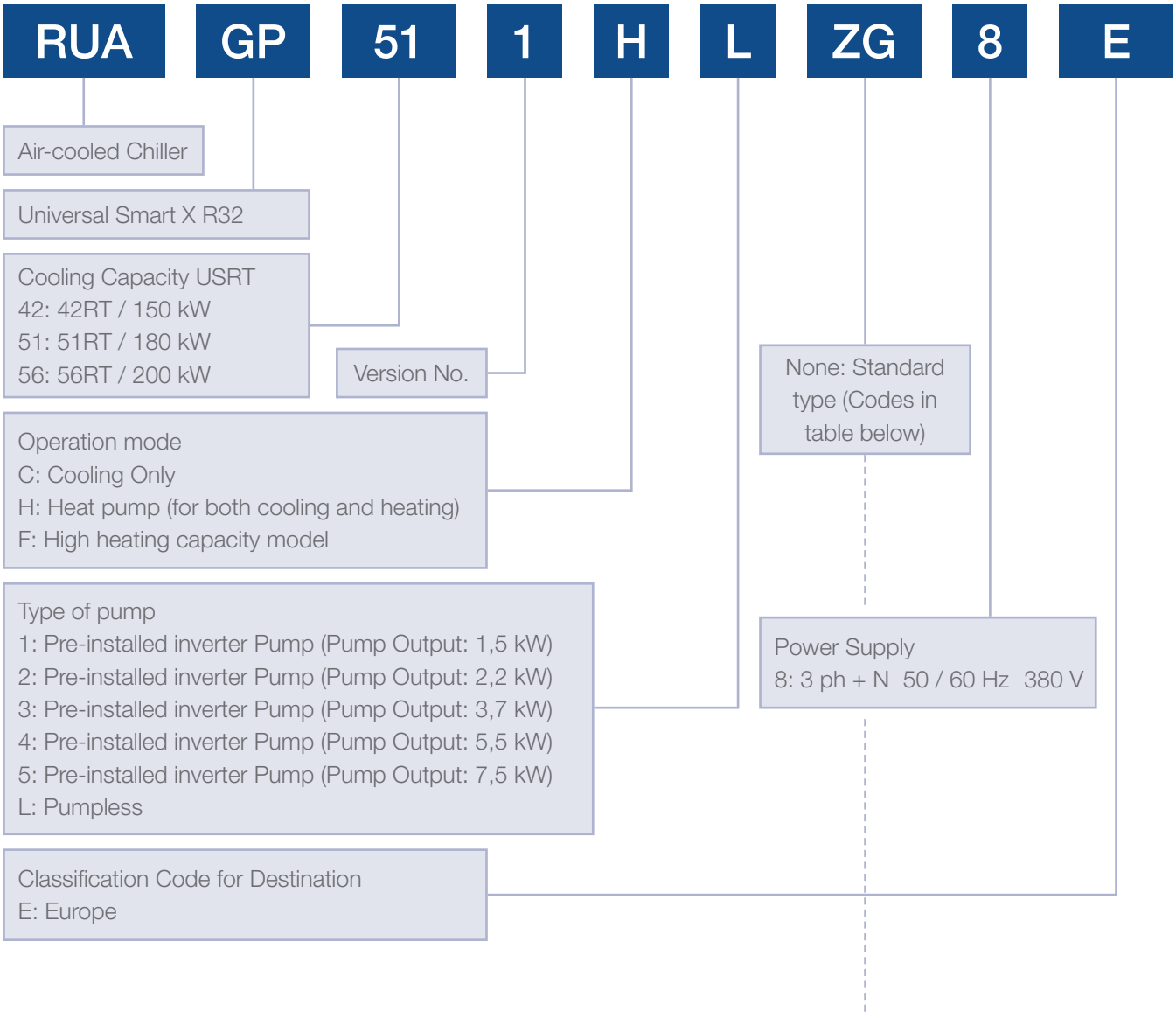
# READING A MODEL NAME




| Code | High EER type | Brine specifications | Resistance to salt | High resistance to salt |
|---|---|---|---|---|
| N | X | | | |
| R | | X | | |
| Z | | | X | |
| ZG | | | | X |
| NR | X | X | | |
| NZ | X | | X | |
| NG | X | | | X |
| RZ | | X | X | |
| RG | | X | | X |
| WZ | X | X | X | |
| WG | X | X | | X |

# OPTION PARTS

- Module Controller (MC)
- Group Controller (GC)
- Connecting Kit
- Fin Guard Kit
- Flange Kit for hood / net installation
- External temperature sensor
- Wi-Fi SD card for Flash Monitor

# CUSTOM PARTS

- Anti corrosion & heavy anti corrosion models
- Large ΔT specification
- Heat machine specification
- Heat machine specification with cooling operation
- Stainless steel screw set
- Stainless steel water strainter & check value
- Special pump specification
- Heat storage system specification
- Fast start up specification
- Automatic system recovery

# HEAT MACHINE SPECIFICATION CUSTOM OPTION

| | Heating operation OAT Range | |
|---|---|---|
| | without Heat Machine Specification | with Heat Machine Specification |
| Basic | -15°C to 21°C DB, 15,5°C WB | -15°C to 43°C DB, 32°C WB |
| HiHeating Capacity Model | -25°C to 21°C DB, 15,5°C WB | -25°C to 43°C DB, 32°C WB |

A large number of options, which with conventional chiller products first have to be configured at great expense, are already implemented as standard in the Basic-USX modules!
Just two examples are the standard features for suppressing harmonics or the inverter control of the 4 fans, which makes additional low-noise options superfluous.

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# We will advise you personally

## YOUR CERTIFIED TOSHIBA PARTNER

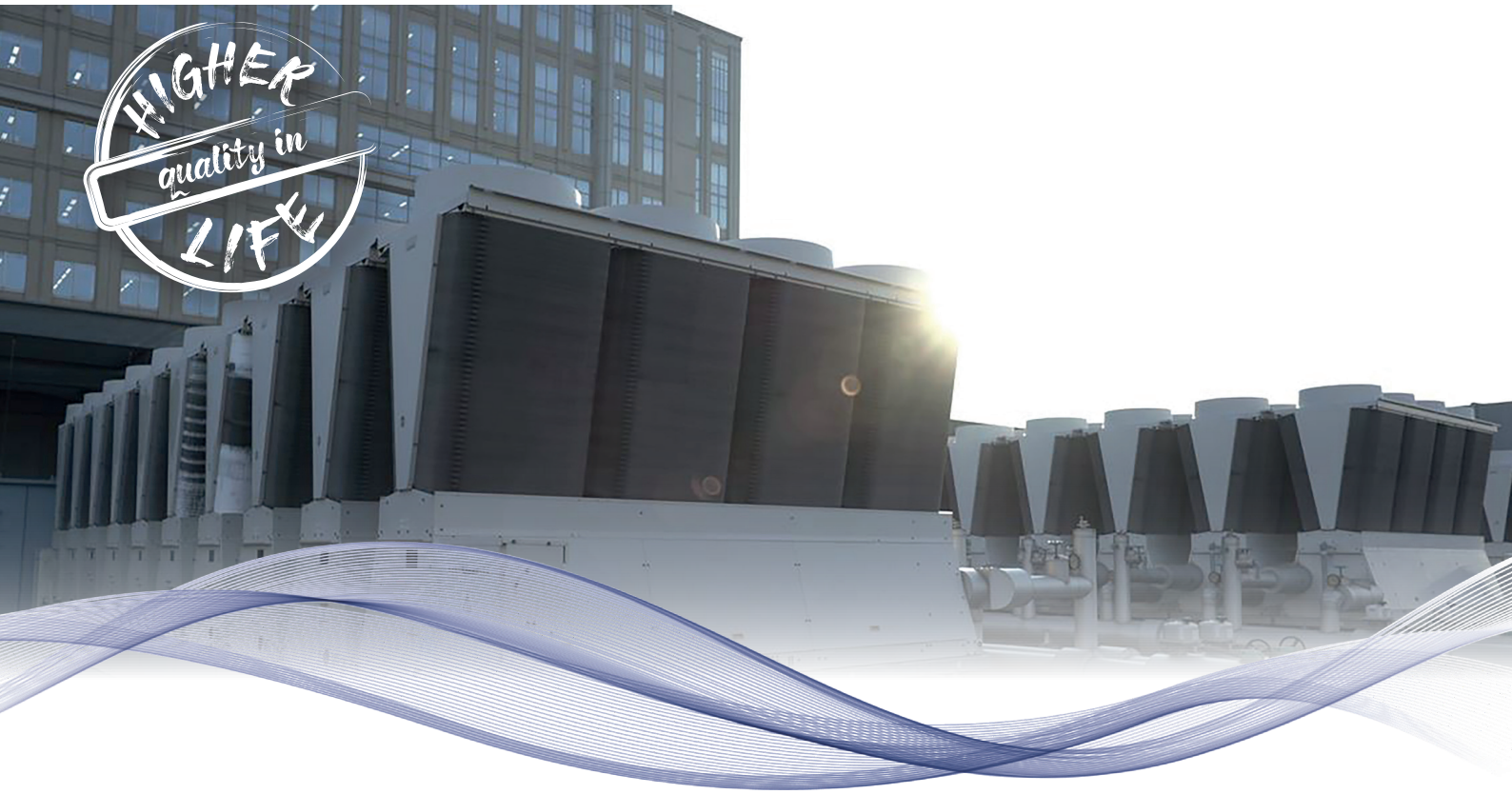
TOSHIBA specialist partner:

TOSHIBA is proud of its network of qualified specialist companies in the refrigeration and air conditioning industry. With a TOSHIBA air conditioning system, you not only get top product quality, you also receive professional advice, planning, installation and service. Rely on a perfect climate from a specialist!

**From small to huge**

With the commercial applications for industry and trade, TOSHIBA covers the entire range. Contact your TOSHIBA specialist partner or visit our website for detailed information.

Better Air Solutions




## For even more information: Visit our website!

Further information about TOSHIBA products and sales partners can be found directly on our website: **www.toshiba-aircondition.com**

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