



**CHILLER & HEATPUMP
UNIVERSAL SMART X
USX Road Show**



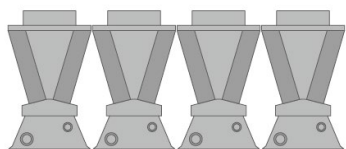
USX concept

The philosophy behind



CHILLER & HEATPUMP *UNIVERSAL SMART X*

THE NEW R32 DIMENSION OF REFRIGERATION & HEATING

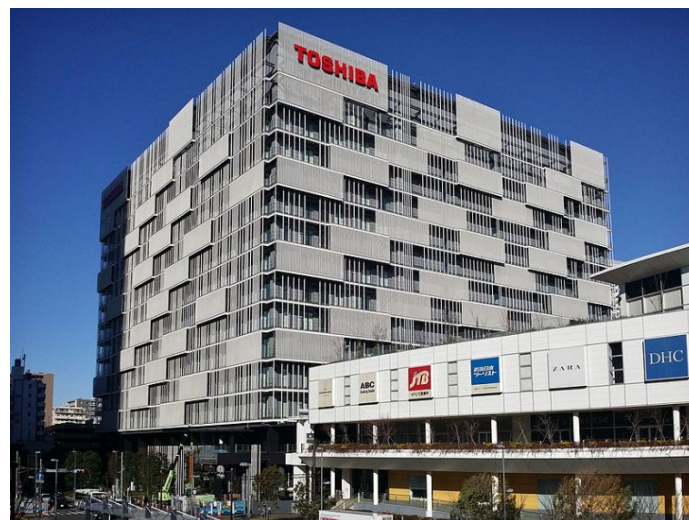


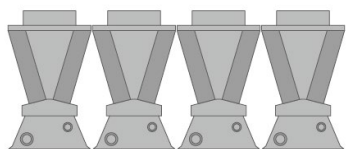
Co je USX?

- Universal Smart X (USX) je **vzduchem chlazený, reverzibilní modulární chiller**.
- USX je **prodejní jednička** pro vzduchem chlazené chillery v Japonsku.
- USX bylo navrženo pro **vysokou účinnost, nízké provozní náklady a jednoduchou instalaci & údržbu**.
- USX je **perfektní řešení** pro široké spektrum aplikací.



- ✓ Data centra
- ✓ Nemocnice
- ✓ Kanceláře
- ✓ Čisté prostory
- ✓ Průmyslovou výrobu
- ✓ Procesní chlazení & topení





Proč USX?

➤ 5 faktorů pro úspěch:

Historie

Flexibilita

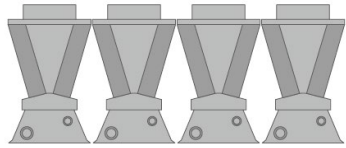
Zodpovědnost

Zkušenost

Jednoduchost

TOSHIBA





Historie TOSHIBA Chillerů 1997 ~ 2020

Integrated-type Screw Chiller 50~160HP



- High efficiency small screw compressor
- ODP = 0 R134a adopted *(Industry first)*

1997

Super Flex Module Chiller SFMC 30,45HP



- High efficiency scroll compressor *(Industry No. 1)*
- X - Frame structure *(Industry first)*
- Improvement of water spray efficiency *(Industry No. 1)*
- High precision pump variable flow control *(Industry first)*
- Partial load priority group control
- (Parallel control of 3 compressors and module group control)
- Uses refrigerant R410A *(Industry first)*

2006

Flex Module Chiller FMC 30,40HP



- High efficiency reciprocating compressor
- Modular design *(Industry first)*
- Partial load priority group control
- Built-in variable flow pump *(Industry first)*
- Equipped with water spray *(Industry first)*
- Uses refrigerant R407C

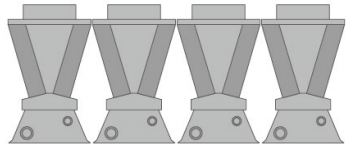
2003

Universal Smart X USX 30,40,50HP



- New development of the world's largest capacity high-efficiency inverter twin rotary compressor *(Industry No. 1)*
- Partial load priority group control
- Evolution of X-frame structure *(Industry first)*
- Module in module design *(Industry first)*
- Improvement of water sprinkler efficiency *(Industry No. 1)*
- More precise pump variable flow control *(Industry first)*
- Uses refrigerant R410A

2010



Historie TOSHIBA Chillerů 1997 ~ 2020

USX Series 3



- High efficiency by concentrated winding, etc. *(Industry No. 1)*
- New development of compressor *(Industry No. 1)*
- No power supply harmonics by three-phase PWM *(Industry first)*
- 99% power factor by three-phase PWM *(Industry No. 1)*

2015

Universal Smart X USX EDGE Series 60,70HP



- World's largest capacity high-efficiency inverter *(Industry No. 1)*
- 70HP module *(Industry No. 1)*
- Both capacity and space saving with EDGE form *(Industry No. 1)*
- Improved low outside air heating capacity *(Industry No. 1)*

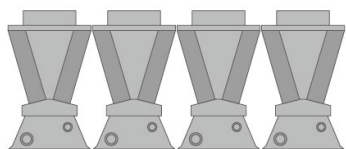
2017

Universal Smart X USX EDGE Series 50, 60 & 70 HP

- USX EDGE series available with R32 refrigerant for Japanese and EMEA market
- Large capacity DC inverter twin rotary compressor
- Reduced installation costs due to advanced harmonic & power factor correction
- Enhanced heating capacity for low ambient conditions
- High reliability achieved from compact / space saving modular design
- Modular control for up to 8960 HP
- Wi-Fi connection for data collection and analysis

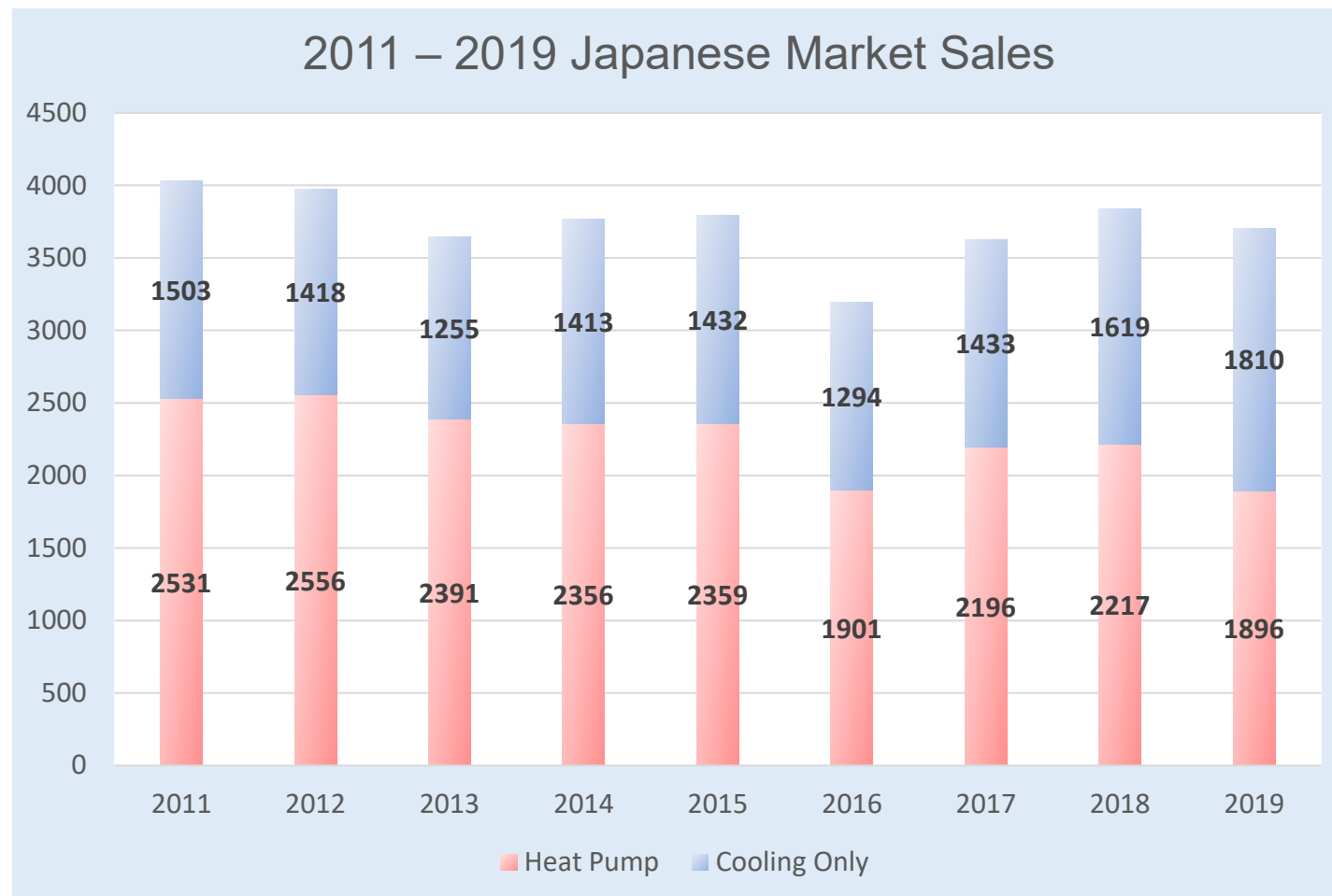
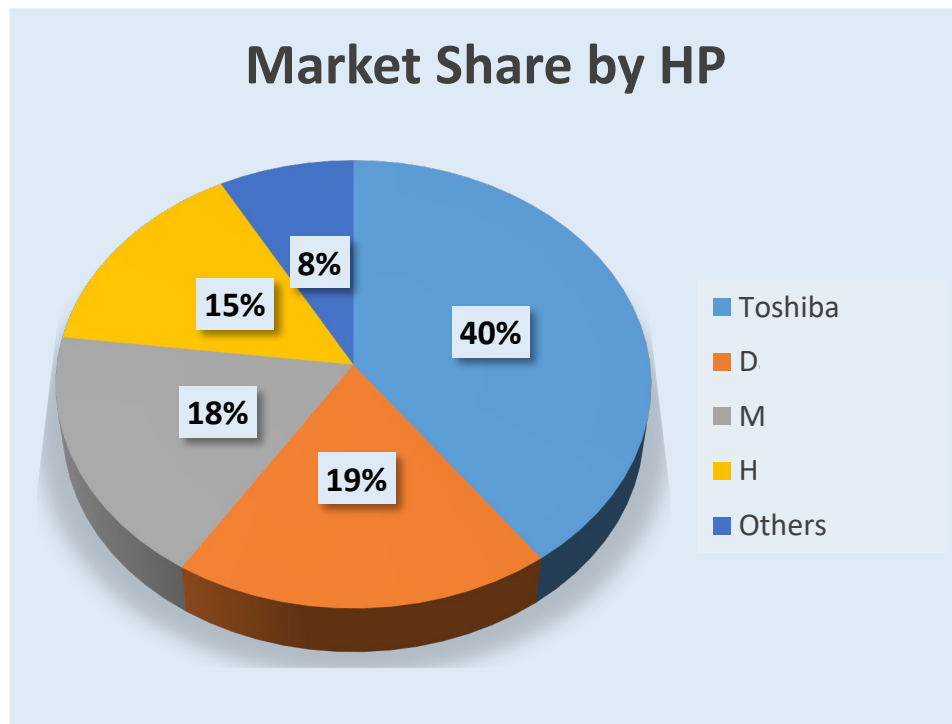


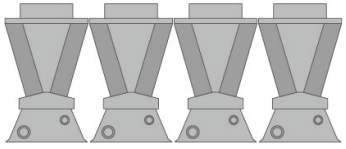
2020



Historie - USX úspěchy

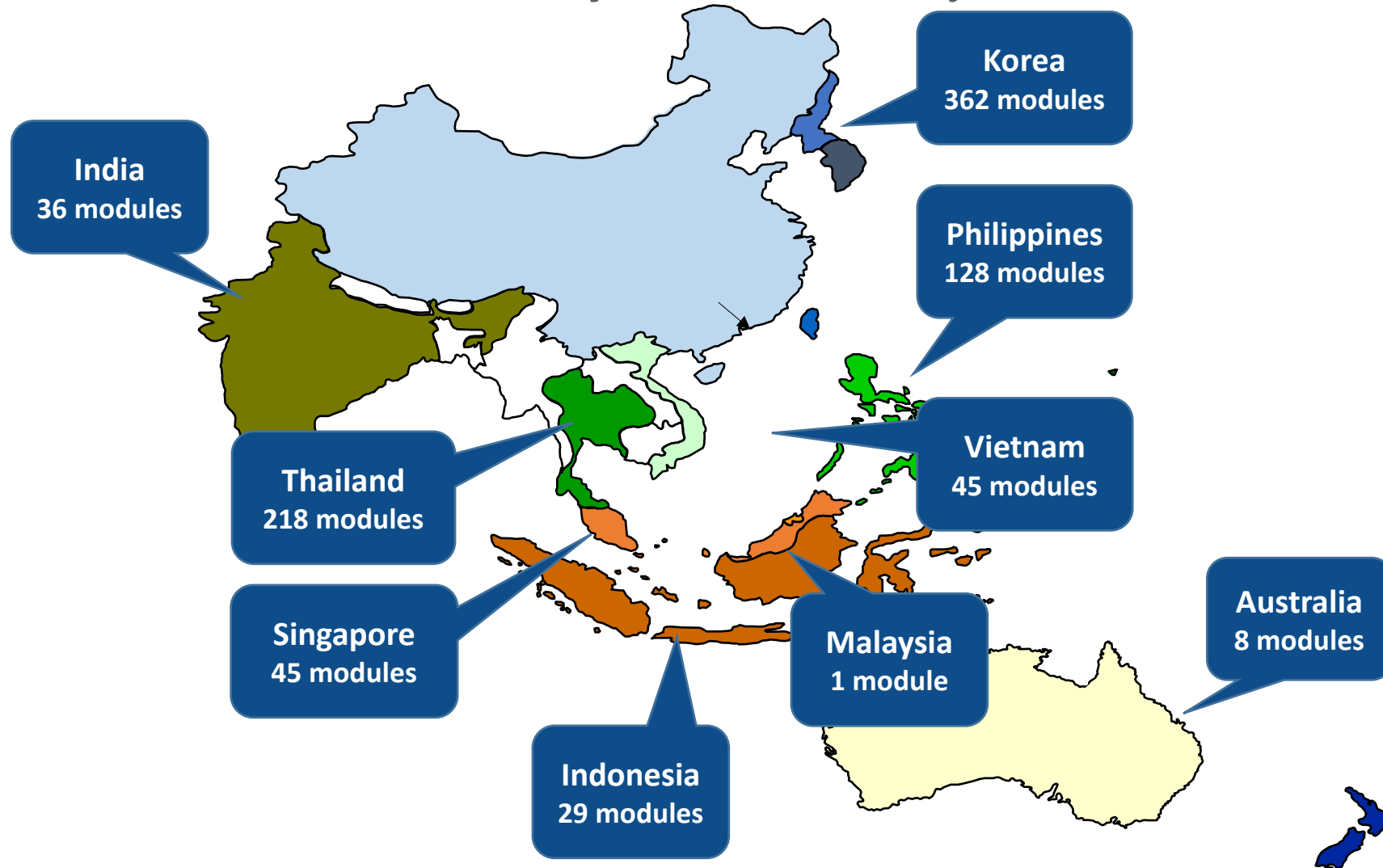
➤ Více než 45.000 USX modulů prodaných 2006-2019 v Asii

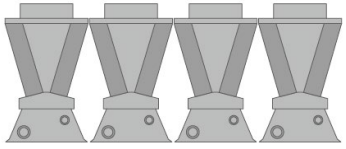




Historie - USX úspěchy

➤ Celkově 872 Toshiba modulárních jednotek dodaných za rok





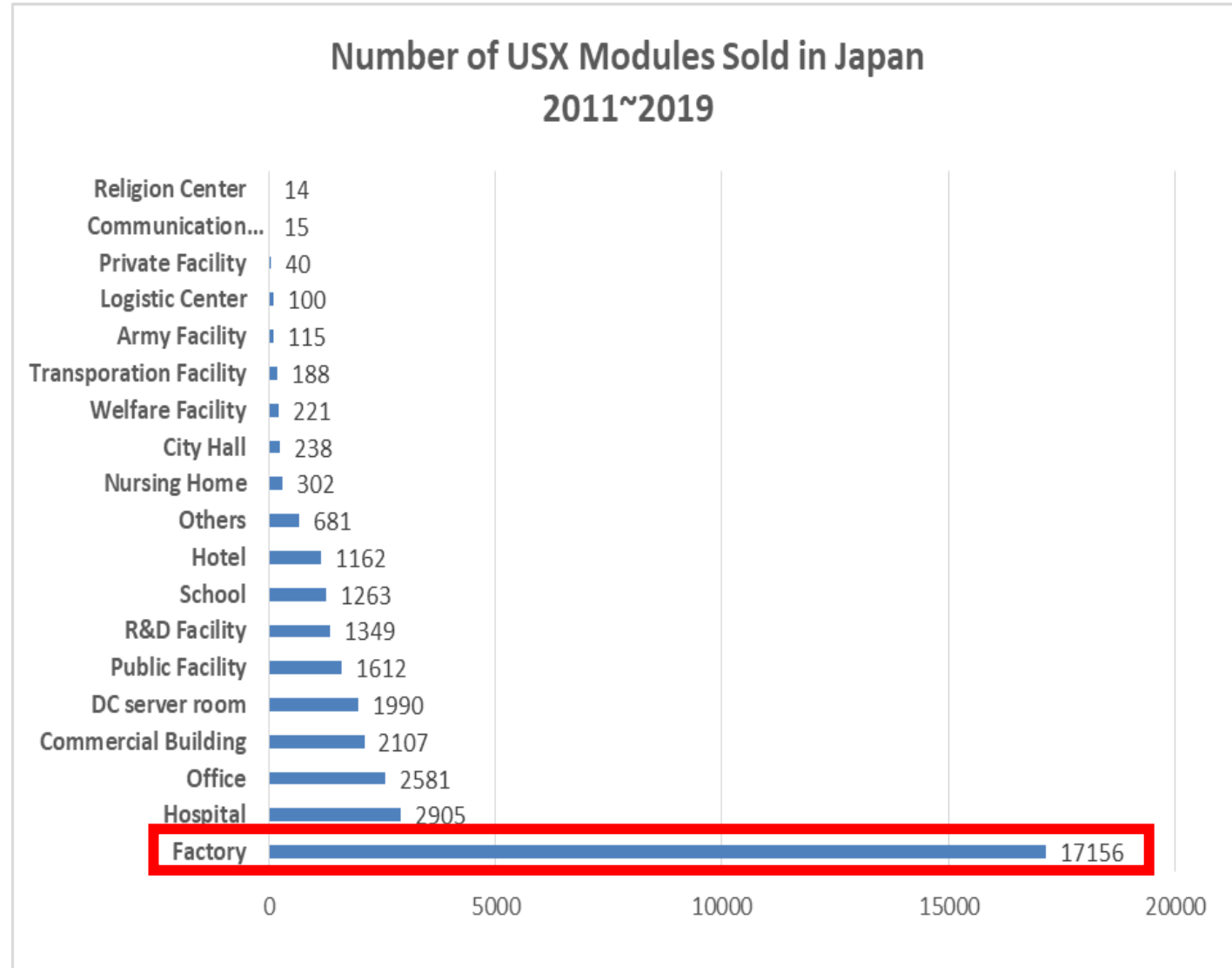
Historie - USX úspěchy

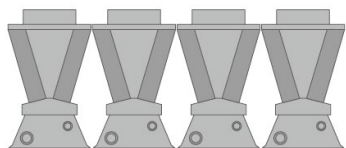
➤ Cílové skupiny

Hlavní oblasti aplikace:

➤ Továrny/Průmysl

➤ **Velké komerční aplikace**





Flexibilita - USX Line Up

➤ Moduly a názvosloví kombinací

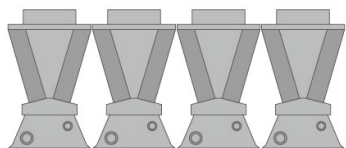
Samostatná USX jednotka:
150, 180, 200 kW



USX modul:
↑16 jednotek, ↑ 3.2 MW



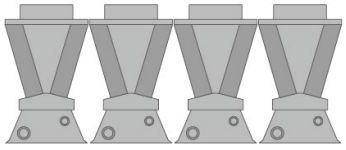
USX systém:
↑8 modulů, ↑25.6 MW



Flexibilita - USX Line Up

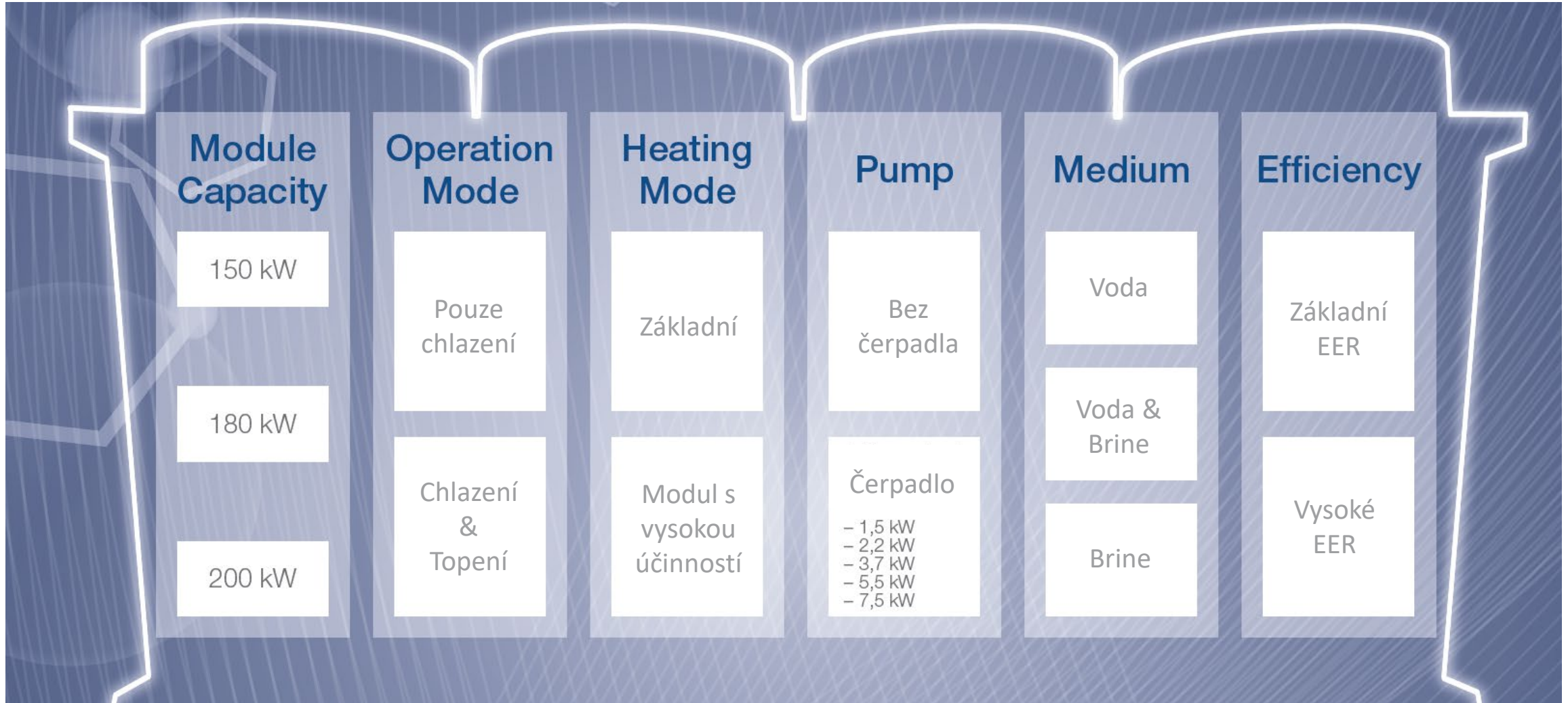
➤ Samostatný modul

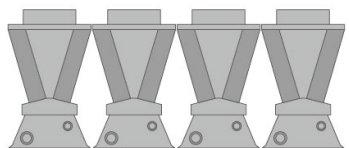




Flexibility - USX Line Up

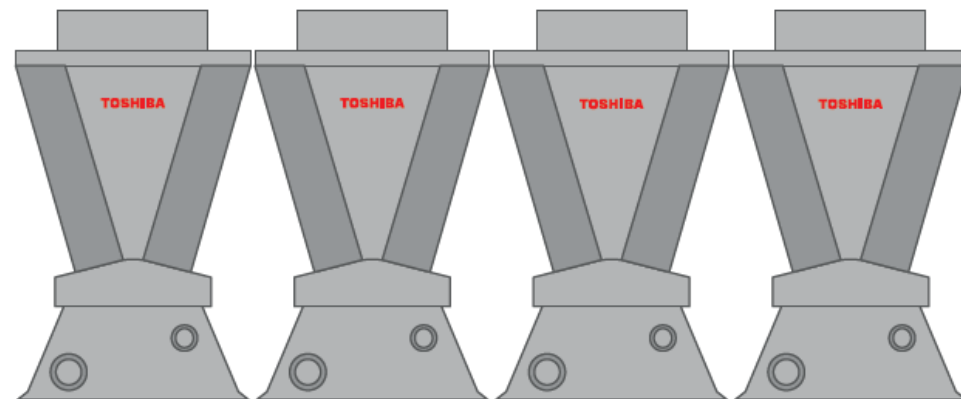
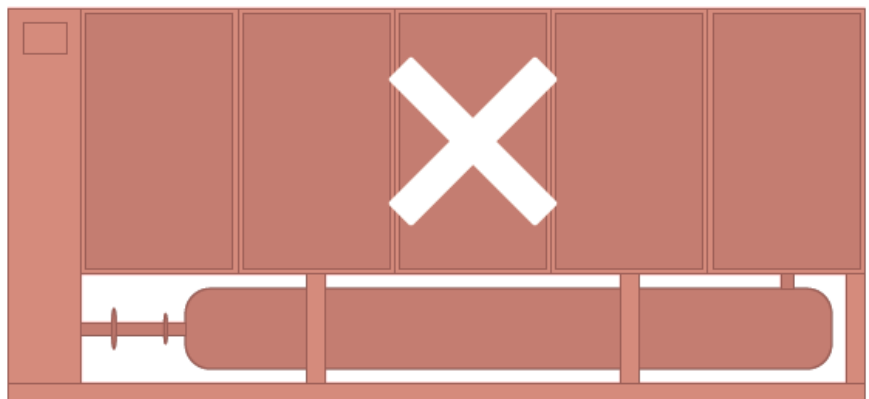
➤ Samostatný modul – možnosti kombinací

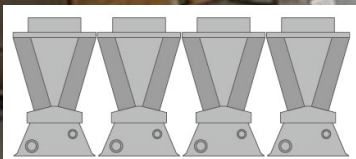




Flexibilita - USX vždy skladem

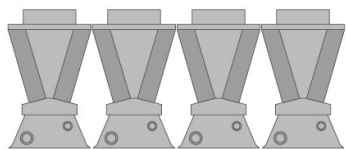
➤ Vadná jednoka? – okamžitá výměna!





Flexibilita - USX vždy skladem



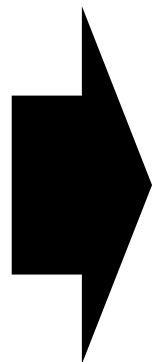


Jednoduchost – návrh USX

- Snadný návrh & proces výběru jednotky



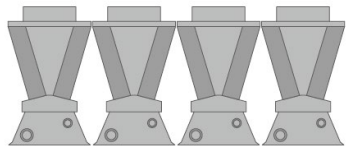
Jednoduchý dotazník!



Návrhový
program



Výstupní
dokumentace &
nabídka



Jednoduchost – návrh USX

➤ Snadný návrh & proces výběru jednotky

Výstupní data o zařízení

TOSHIBA

INTERPRETATION QUESTIONNAIRE
TOSHIBA UNIVERSAL SMART X EDGE Series

Company: _____
Project name: _____ Site location: _____
Application: (space cooling/heating, process, production, etc.) _____
Delivery date: _____

Cooling capacity in kW: _____ Leaving water temp. in °C: _____ Entry water temp. in °C: _____
Max. outdoor ambient temp. in °C: _____
Standard efficiency: _____ High efficiency (water spray system): _____

Heating capacity in kW: _____ Leaving water temp. in °C: _____ Entry water temp. in °C: _____
Min. outdoor ambient temp. in °C: _____

Medium: Water _____ Propylenglycol in % _____ Ethylenglycol in % _____

Water pump: External pump head in m: _____ w/o water pump: _____

Accessories and options:
 MODBUS interface
 Connected to BMS
 Fin Guard-KiP
 Anti corrosion coating
 SD Card for Flash Monitor

TOSHIBA

Parametry projektu

Selection tool_6.8.1-RevA

Accessories: Refrigerant: R32 Pow. volt.: 400 V

Conditions: Cooling Heating
 Target Capacity: 120 kW
 Int. Pump: 2.2 kW
 Fixed Param.: EW temp.: _____
 LW temp.: 45 degC
 EW temp.: 40 degC
 Flow rate: 369 L/min
 OA temp. DB: -10 degC
 OA temp. WB: -10.32 degC
 Min ext. press.: 50 kPa

Load ratio (to rated cap.): Max 100% Min 20%
 Qty. of modules: 1 unit(s)
 Fouling factor: 0.0000 m²K&W
 Rel. humidity: 90 %RH

Attached documents: Specifications Dimensional drawings Wiring diagrams

Start of selection Output checked data Part-load curve

Model name	modules	Operating mode	Integrated temp.	EW temp. [degC]	LW temp. [degC]	Capacity [kW]	Cumulated capacity [kW]	Power cons. [kW]	EER or COP	Flow rate [L/min]	Power voltage [V]	Current [A]	Power factor [%]	Pressure drop [kPa]	Ext. pres. [kPa]
<input checked="" type="checkbox"/> RUAGP421F2R8E(M)	1	Heating	W	40	45	120	110	45.4	2.64	362	400	66.9	98	51.1	140
<input type="checkbox"/> RUAGP511F2R8E(M)	1	Heating	W	40	45	120	110	44.7	2.68	362	400	65.9	98	51.1	140

Heating Selection result Restart

Cooling: RUAGP421F2R8E(M) OK (Automatically chosen) Input info.

Program pro výběr jednotky

Location: HENKEL, Hala 1
 System: space cooling & heating
 Date: 02.09.2021

performance characteristics of selected system

List of units

Model name	Quantity
RUAGP421F2R8E(M)	1
Total:	1

Specified conditions and results of estimation

Condition	Value
Outside Air DB (deg.C DB)	35
Outside Air WB (deg.C WB)	---
Outlet Water (deg.C)	7
Inlet Water (deg.C)	12
Outside Air DB (deg.C DB)	-10
Outside Air WB (deg.C WB)	-10.32
Outlet Water (deg.C)	45
Inlet Water (deg.C)	40
Solute of brine/ concentration (Wt%)	Propylene glycol/30%
Fouling factor (m ² K&W)	---
Cooling capacity (kW)	145
Max. cooling capacity (kW)	163
Heating capacity (kW)	120
Integrated heating capacity (Note 1) (kW)	110
Max. heating capacity (kW)	120
SEER/SCOP (-)	4.88 / 4.26
EER (-)	3.49
COP (-)	2.64
Power supply	400 V-3Ph-N-50 Hz
Operation current (A)	60.6
Operation current (A)	66.9
Power consumption (kW)	41.5
Power consumption (kW)	45.4
Power factor (%)	99
Power factor (%)	98
Flow rate range (L/min)	150 to 600
Flow rate (Cooling) (L/min)	440
Flow rate (Heating) (L/min)	362
Pressure drop (Cooling) (kPa)	88.5
Pressure drop (Heating) (kPa)	51.1
External pressure (Cooling) (kPa)	93.6
External pressure (Heating) (kPa)	140
Minimum holding water in system (L)	1,102

Integrated pump specs

Item	Value
Rated output (LW)	2.2
Pumping system	Centrifugal Pump
Starting method	Inverter
Flow control system	Inverter
Max. operation current (A)	4.3 x 1
Max. power consumption (LW)	2.8 x 1

Sound pressure level
 (Measurement position: 1.0 m distance, 1.5 m height)

Position	Value (dB(A))
Control-box side	64.7
Air heat-exchanger side	69.1
Water piping side	65.9

Sound power level

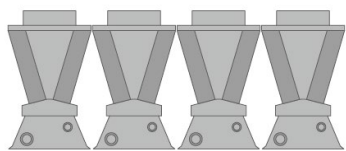
System	Value (dB(A))
Single module	83.8
Overall system	83.8

Electric wiring (without wiring kit)

Item	Value
Location of power supply connectors	Terminal in the power box of each modular unit
Maximum circuit amps (A)	83.3 x 1
Power supply capacity (kVA)	57.8 x 1
Power supply IV wire (mm ²)	38 x 1
Power supply CV wire (mm ²)	22 x 1
Earth wire size (mm ²)	22 x 1
Hand switch capacity (A)	100 x 1
Circuit breaker capacity (A)	100 x 1
Earth leakage circuit breaker capacity (A)	100 (Capacity) x 1
Earth leakage circuit breaker sensitivity (mA)	100 (Sensitivity) x 1

Toshiba Carrier Corporation

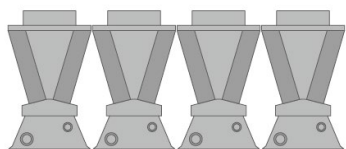
SL_EXP_010_821_002



Zkušenosti – zprovoznění USX

➤ Profesionální pomoc při zprovoznění!





Zodpovědnost - USX skladem

➤ Dodáváme vždy kompletní balík včetně služeb:



Návrh systému



Tech. dokumentace



Rychlá nabídka



Rozšířená záruka
3 roky standardně
+ 2 roky navíc



AirCondCommissioned



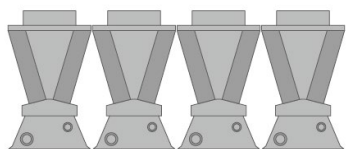
Skladové modely



Zakázková výroba

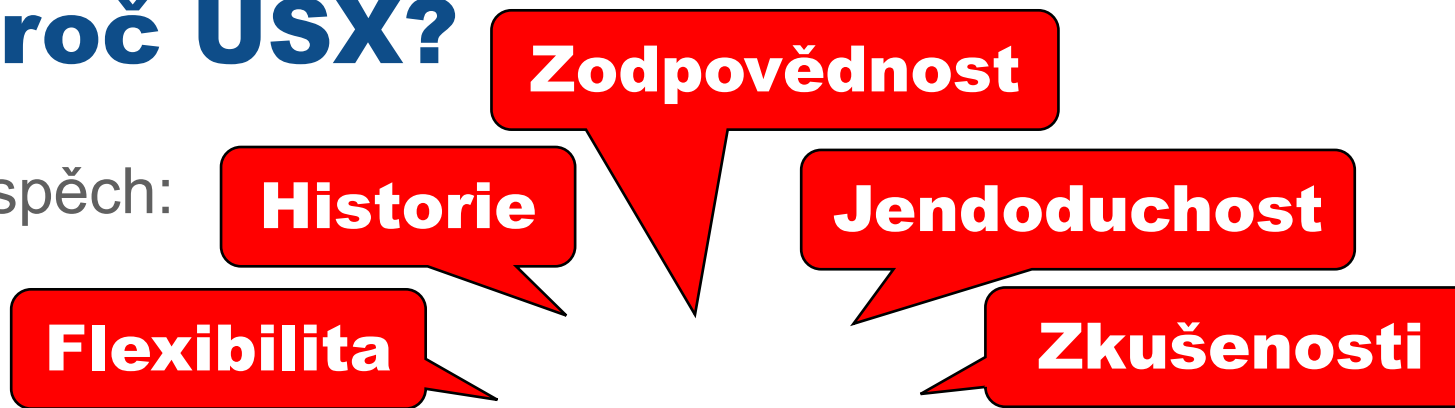


Návod typu „Krok za krokem“



Proč USX?

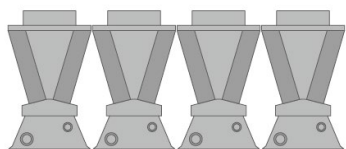
➤ 5 faktorů pro úspěch:



Skladové modely

TOSHIBA





Proč USX?

➤ Destilace do 4 modelů na sklad:

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



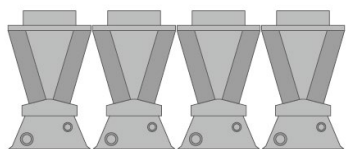
AIR-COND
INTERNATIONAL

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



Skladové modely



USX skladové modely

TOSHIBA



- Zakázková výroba → 6 až 7 měsíců
- „Skladová selekce“ pokryje mnoho aplikací:

- ✓ Průmysl
- ✓ Procesní chlazení & topení
- ✓ VZT s odvlhčováním
- ✓ Kanceláře
- ✓ Hotely
- ✓ Nemocnice
- ✓ Data centra
- ✓ Technické chlazení
- ✓ Obchodní centra

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

RUAGP561C3R8E

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

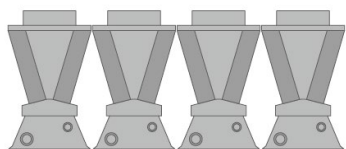
RUAGP561C28E

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



USX skladové modely

➤ Model ①



TOSHIBA

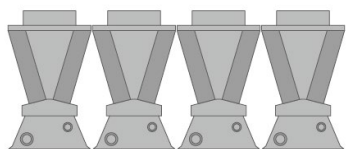
200 KW COOLING ONLY –
BRINE, 3,7 KW PUMP

Type **RUAGP561C3R8E** stock model

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

Vhodný pro:

- ✓ Průmysl
- ✓ Procesní chlazení
- ✓ VZT s odvlhčováním
- ✓ Nemocnice



USX skladové modely

➤ Model ②



TOSHIBA

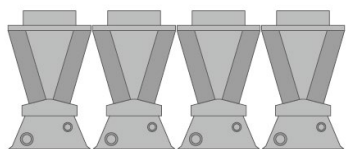
200 KW COOLING ONLY –
WATER / BRINE, 2,2 KW PUMP

Type **RUAGP561C28E** stock model

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

Vhodný pro:

- ✓ VZT s odvlhčováním
- ✓ Kanceláře
- ✓ Hotely
- ✓ Nemocnice
- ✓ Data centra
- ✓ Technické chlazení
- ✓ Obchodní centra



USX skladové modely

➤ Model ③



TOSHIBA

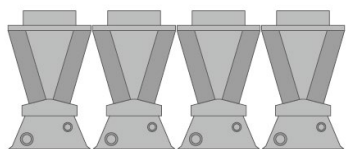
150 KW HEATPUMP, HIHEATING –
WATER / BRINE, 2,2 KW PUMP

Type RUAGP421F28E stock model

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

Vhodný pro:

- ✓ VZT s odvlhčováním
- ✓ Kanceláře
- ✓ Hotely
- ✓ Nemocnice
- ✓ Obchodní centra



USX skladové modely

➤ Model ④



TOSHIBA

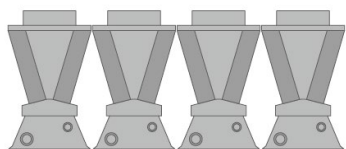
180 KW HEATPUMP, HIHEATING –
WATER / BRINE, 2,2 KW PUMP

Type **RUAGP511F28E** stock model

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

Fits best for:

- ✓ VZT s odvlhčováním
- ✓ Kanceláře
- ✓ Hotely
- ✓ Nemocnice
- ✓ Obchodní centra



Why USX?

➤ 5 plus 1 faktor pro úspěch:

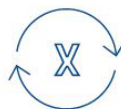


Technologie

SMART FEATURES



Wide operation range



Twin rotary compressor –
stepless controlled 5 – 100 %



Operational reliability
by modular design



All year prompt deliverable
from Vienna warehouse



Environmentally friendly
refrigerant R32



Continuous heating



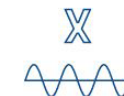
150 kW – 25,6 MW performance
range scaled modular



space saving X-frame
chassis design



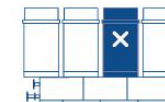
WiFi connectivity



High electric power factor



High energy efficiency



Auto Back-Up function

TOSHIBA

