

НА ВНИМАНИЕТО НА  
Г-Н ГЕОРГИ КИРКОВ  
Изпълнителен Директор



Оферта № 47-23/ NPP Kozloduy

Изх.№ 74

Дата: 15.05.2023 г.

Относно: Покана за пазарна консултация № 51147  
Доставка на нови абсорбционни охладителни машини

Уважаеми г-н Кирков,

Във връзка с поканата за пазарна консултация №51147 за доставка на нови абсорбционни охладителни машини (АОМ) за 5-ти и 6-ти блок на АЕЦ Козлодуй, бихме искали да Ви представим нашата необвързваща бюджетна цена в съответствие с приложената Техническа Спецификация към поканата, а именно:

1. 5,6 UX11H01 с Охладителна мощност 2000 kW (568,7 USRT)  $\pm$  10% - 2 бр.
2. 5,6 UX21H01 с Охладителна мощност 3000 kW (568,7 USRT)  $\pm$  10% - 2 бр.

Въз основа на опита, който имаме от приблизително 18 годишна експлоатация и сервизно обслужване от наша страна на действащите в момента абсорбционни охладителни машини монтирани в АЕЦ Козлодуй на EBARA Corporation, имаме удоволствието отново съвместно с EBARA Corporation да Ви предложим ново поколение високо-ефективни двойно действащи абсорбционни охладителни машини.

В Приложение №1 към настоящата покана за пазарна консултация Ви предлагаме подробна техническа информация за новите машини, включително описание на основните елементи на машините и материалите от които са направени, а в Приложение №2 са показани основните размери на двата типоразмера на абсорбционите машини.

Срока за производство и доставка на абсорбционите машини ще бъде от 7 до 9 месеца от датата на официалната поръчка и открит 100% документарен акредитив (L/C), неотменяем, потвърден от първокласна Европейска или Японска банка на виждане при отваряне на поръчката.

Приблизителната цена само за доставка на четирите абсорбционни охладителни машини, описани в настоящата покана за пазарна консултация към



**TOSHIBA**  
Leading Innovation >>>

**BLUE BOX**



**VIESSMANN**

Place of registration: 13 Radetski Str.,  
1616 Sofia, Bulgaria

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настоящия момент е в размер на 2 000 000 USD. Цената е направена при среден официален обменен курс 1.00 USD = 136.10 JPY при диапазон (1.00 USD = 132.02 – 140.18 JPY). При промяна на цената обменния курс в посочените граници, цената ще се ревизира преди откриването на L/C.

Посочената цена е само за доставка машините и не включват всички дейности свързани с проекти разработки за демонтаж на стрите абсорбционни машини, изкарването им от машинните помещения и монтажа на новите такива.

В цената не са включени цените за супервайзер от страна на EBARA Corporation за монтаж на машините, както и всички пусково – наладъчни работи преди пуска на машините, както и обучението на персонала в АЕЦ Козлодуй.

Така направената индикативна необвързваща цена в тази покана за пазарна оценка е със срок на валидност 30 дни.

Надяваме се, че нашата ценова информация относно поканата за пазарна консултация, касаеща доставката на 4 бр. абсорбционни охладителни машини ще удовлетвори Вашите изисквания.

За всяка допълнителна информация ние сме на Ваше разположение по всяко време.

Приложения:

1. Приложение №1 – Технически характеристики на абсорбционните охладителни машини, основни елементи и материали от които са направени машините.
2. Приложение №2 – Основни размери и тегла на оборудването

С уважение,  
**Vesselin**  
**Raykov**  
**Madjarov**

Digitally signed  
by Vesselin  
Raykov Madjarov  
Date: 2023.05.15  
14:42:08 +03'00'

В. Маджаров - Упеавител

## 1. SPECIFICATION DATA

MODEL		RGW058B
LOCATION	-	INDOOR, NON-HAZARDOUS
APPLIED STANDARD	-	EBARA STANDARD / GB-T_18431-2014 / MD / EMC/ PED(or SEP)
COOLING CAPACITY	kW	2 000 ( 568.8 USRT )
TURN DOWN RATIO	%	100 ~ 20% , UNDER 20% ON-OFF
CHILLED WATER		
MEDIUM	-	FRESH WATER
IN /OUT TEMP.	°C	12.0 → 7.0
FLOW RATE	L/min	5 734
MAX. WORKING PRESSURE	MPaG	1.0 ( 10 kgf/cm <sup>2</sup> G)
FOULING FACTOR	m <sup>2</sup> K/kW	0.086
	m <sup>2</sup> h°C/kcal	0.0001
PASS	-	2
PRESSURE DROP	kPa	60 ( 6.1 mH <sub>2</sub> O)
COOLING WATER		
MEDIUM	-	FRESH WATER
IN /OUT TEMP.	°C	32.0 → 37.5
FLOW RATE	L/min	9 257
MAX. WORKING PRESSURE	MPaG	1.0 ( 10 kgf/cm <sup>2</sup> G)
FOULING FACTOR	m <sup>2</sup> K/kW	0.086
	m <sup>2</sup> h°C/kcal	0.0001
PASS	-	2(ABS.) + 1(COND.)
PRESSURE DROP	kPa	104 ( 10.6 mH <sub>2</sub> O)
STEAM		
SUPPLY PRESSURE	MPaG	0.80 ( 7.8 kgf/cm <sup>2</sup> G)
TEMPERATURE	°C	Saturated Temp.
CONSUMPTION	kg/h	2 280
DRAIN PRESSURE	MPaG	Min. 0.05
DRAIN TEMPERATURE	°C	Max. 90
ELECTRICAL DATA		
POWER SOURCE	V × Hz	380V X 50Hz
CONTROL CIRCUIT	V × Hz	200V X 50Hz with transformer for control circuit
POWER CAPACITY	kVA	23.7
REFRIGERANT PUMP	kW	3 + 3
SOLUTION PUMP	kW	3 + 3
SOLUTION SPRAY PUMP	kW	1.8 + 3
-----	-----	-----
VACUUM PUMP	kW	0.75
FLANGE CONNECTION		
FLANGE TYPE	-	JIS10K FF
CHILLED WATER	mm	250 ( 10" )
COOLING WATER INLET	mm	250 ( 10" )
COOLING WATER OUTLET	mm	250 ( 10" )
STEAM	mm	100 ( 4" )
STEAM DRAIN	mm	50 ( 2" )
RUPTURE DISK	mm	50 ( 2" )
DIMENSIONS	mm	6 500 x 2 490 x 3 160
APPROX. RUNNING WEIGHT	ton	21
REQUIRED UNIT	set	1
SHIPPING STYLE	-	1 PIECES SHIPMENT

## Note:

- Quality of chilled water ,cooling water and steam drain shall be controlled according to JRA-GL-02E-1994 (Guideline of the JAPANESE REFRIGERATION AND AIR CONDITIONING INDUSTRY ASSOCIATION).
- Capacity is according to GB-T\_18431-2014

## 2. EQUIPMENT DATA (QUANTITY BELOW SHOWS FOR ONE UNIT)

EQUIPMENT	Q'TY	NOTE
EVAPORATOR/ABSORBER	1	Shell & Tube. Tube set: Expanding
LOW TEMP. GENERATOR/ CONDENSER	1	Shell & Tube. Tube set: Expanding
HIGH TEMP. GENERATOR	1	Shell & Tube. Tube set: Expanding
SOLUTION HEAT EXCHANGER (HIGH, LOW TEMPERATURE)	1set	Plate Heat Exchanger
DRAIN HEAT EXCHANGER	1	Plate Heat Exchanger
DRAIN TRAP	1	Float Ball Type for steam condensate line
VFD PANEL	2	Solution & spray pump speed control
AUTO PURGE UNIT	1	
CONTROL PANEL	1	Refer to Para.7
REFRIGERANT PUMP	1	Hermetic Canned Motor Type
SOLUTION PUMP	2	Hermetic Canned Motor Type
SOLUTION SPRAY PUMP	2	Hermetic Canned Motor Type
VACUUM PUMP	1	
LiBr SOLUTION	1set	48% Concentration For Initial Charge
REFRIGERANT	1set	Pure Water For Initial Charge
SAFETY CONTROL DEVICES	1set	Refer to safety devices list
CAPACITY CONTROL VALVE	-----	
SOLUTION FILTER	1 set	Cartridge Type
STEAM SHUT-OFF VALVE	-----	
NAME PLATE	1	EBARA REFRIGERATION EQUIPMENT&SYSTEMS CO.,LTD.

## 3. MAJOR SAFETY DEVICES FOR AUTOMATIC SHUTDOWN

When any following safety device is worked, chiller automatically stops with buzzer sounds, and capacity control valve shall be fully closed. Activated error is indicated on the control panel by lamp.

## 1) INTERNAL SAFETY DEVICES

*CHW LOW FLOW	*CHW LOW TEMP.	*GH SOL. HIGH TEMP.	*GH HIGH PRESS.
*REF. LOW TEMP.	*CW HIGH TEMP.	*LOW COOLING CAPACITY	*SP OVER LOAD
*RP OVER LOAD	*CW LOW TEMP.	*CAPACITY VALVE FAILURE	*SSP OVER LOAD
*POWER FAILURE			

## 2) EXTERNAL SAFETY DEVICES

*EXTERNAL EMERGENCY STOP	*CHW PUMP INTERLOCK	*CW PUMP INTERLOCK
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## 4. SAFETY SYSTEMS

Following devices and equipments control chiller safely.

*GH DEW POINT TEMP. CONTROL	*GH SOL. TEMP. CONTROL
*REF. OVERFLOW	*SOL. OVERFLOW
*REF. LIQUID LEVEL	*RUPTURE DISK

## 5. PRE-ALARM

*TEMP. SENSOR FAILURE	*CW LTD
*INTERNAL HIGH PRESS.	*AUTO PURGE UNIT FAILURE
*ANNUNCIATION OF PARTS REPLACEMENT	

## 6. MATERIALS

COMPONENT	PART	MATERIALS	NOTES
		(ACCORDING TO GB or EQUIVALENT)	
EVAPORATOR ABSORBER	SHELL	Q235B(GB/T 3275)	CS
	TUBE PLATE	Q235B(GB/T 3275)	CS
	EVAP. TUBE	TP1 (GB/T17791, GB/T5231)	Copper
	ABS. TUBE	SUS316L(GB/T 12771)	SS
	WATER BOX	Q235B(GB/T 3275)	CS, Epoxy Painted
CONDENSER LOW TEMP. GENERATOR	SHELL	Q235B(GB/T 3275)	CS
	TUBE PLATE	Q235B(GB/T 3275)	CS
	COND. TUBE	SUS316L(GB/T 12771)	SS
	GENE. TUBE	SUS436L(GB/T 12771)	SS
	WATER BOX	Q235B(GB/T 3275)	CS, Epoxy Painted for condenser
HIGH TEMP. GENERATOR	SHELL	Q235B(GB/T 3275)	CS
	TUBE PLATE	Q235B(GB/T 3275)	CS
	TUBE	S22053(GB/T21832)	Stainless Steel Seamless
	STEAM BOX	Q345R (GB/T 713)	CS
SOL. HEAT EXCHANGER	FRAME		
	PLATE		
DRAIN HEAT EXCHANGER	FRAME		
	PLATE		

## 1. SPECIFICATION DATA

MODEL		RGW090B
LOCATION	-	INDOOR, NON-HAZARDOUS
APPLIED STANDARD	-	EBARA STANDARD / GB-T_18431-2014 / MD / EMC/ PED(or SEP)
COOLING CAPACITY	kW	3 000 ( 853.2 USRT )
TURN DOWN RATIO	%	100 ~ 21% , UNDER 21% ON-OFF
CHILLED WATER		
MEDIUM	-	FRESH WATER
IN /OUT TEMP.	°C	12.0 → 7.0
FLOW RATE	L/min	8 600
MAX. WORKING PRESSURE	MPaG	1.0 ( 10 kgf/cm <sup>2</sup> G)
FOULING FACTOR	m <sup>2</sup> K/kW	0.086
	m <sup>2</sup> h°C/kcal	0.0001
PASS	-	2
PRESSURE DROP	kPa	98 ( 10.0 mH <sub>2</sub> O)
COOLING WATER		
MEDIUM	-	FRESH WATER
IN /OUT TEMP.	°C	32.0 → 37.6
FLOW RATE	L/min	13 656
MAX. WORKING PRESSURE	MPaG	1.0 ( 10 kgf/cm <sup>2</sup> G)
FOULING FACTOR	m <sup>2</sup> K/kW	0.086
	m <sup>2</sup> h°C/kcal	0.0001
PASS	-	2(ABS.) + 1(COND.)
PRESSURE DROP	kPa	96 ( 9.8 mH <sub>2</sub> O)
STEAM		
SUPPLY PRESSURE	MPaG	0.80 ( 7.8 kgf/cm <sup>2</sup> G)
TEMPERATURE	°C	Saturated Temp.
CONSUMPTION	kg/h	3 405
DRAIN PRESSURE	MPaG	Min. 0.05
DRAIN TEMPERATURE	°C	Max. 90
ELECTRICAL DATA		
POWER SOURCE	V × Hz	380V X 50Hz
CONTROL CIRCUIT	V × Hz	200V X 50Hz with transformer for control circuit
POWER CAPACITY	kVA	29.1
REFRIGERANT PUMP	kW	3.7 + 3.7
SOLUTION PUMP	kW	3.7 + 3.7
SOLUTION SPRAY PUMP	kW	2.2 + 3.7
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VACUUM PUMP	kW	0.75
FLANGE CONNECTION		
FLANGE TYPE	-	JIS10K FF
CHILLED WATER	mm	250 ( 10 " )
COOLING WATER INLET	mm	300 ( 12 " )
COOLING WATER OUTLET	mm	300 ( 12 " )
STEAM	mm	100 ( 4 " )
STEAM DRAIN	mm	50 ( 2 " )
RUPTURE DISK	mm	50 ( 2 " )
DIMENSIONS	mm	7 560 x 2 780 x 3 530
APPROX. RUNNING WEIGHT	ton	32
REQUIRED UNIT	set	1
SHIPPING STYLE	-	1 PIECES SHIPMENT

Note:

- 1) Quality of chilled water ,cooling water and steam drain shall be controlled according to JRA-GL-02E-1994 (Guideline of the JAPANESE REFRIGERATION AND AIR CONDITIONING INDUSTRY ASSOCIATION).
- 2) Capacity is according to GB-T\_18431-2014

## 2. EQUIPMENT DATA (QUANTITY BELOW SHOWS FOR ONE UNIT)

EQUIPMENT	Q'TY	NOTE
EVAPORATOR/ABSORBER	1	Shell & Tube. Tube set: Expanding
LOW TEMP. GENERATOR/ CONDENSER	1	Shell & Tube. Tube set: Expanding
HIGH TEMP. GENERATOR	1	Shell & Tube. Tube set: Expanding
SOLUTION HEAT EXCHANGER (HIGH, LOW TEMPERATURE)	1set	Plate Heat Exchanger
DRAIN HEAT EXCHANGER	1	Plate Heat Exchanger
DRAIN TRAP	1	Float Ball Type for steam condensate line
VFD PANEL	2	Solution & spray pump speed control
AUTO PURGE UNIT	1	
CONTROL PANEL	1	Refer to Para.7
REFRIGERANT PUMP	1	Hermetic Canned Motor Type
SOLUTION PUMP	2	Hermetic Canned Motor Type
SOLUTION SPRAY PUMP	2	Hermetic Canned Motor Type
VACUUM PUMP	1	
LiBr SOLUTION	1set	48% Concentration For Initial Charge
REFRIGERANT	1set	Pure Water For Initial Charge
SAFETY CONTROL DEVICES	1set	Refer to safety devices list
CAPACITY CONTROL VALVE	-----	
SOLUTION FILTER	1 set	Cartridge Type
STEAM SHUT-OFF VALVE	-----	
NAME PLATE	1	EBARA REFRIGERATION EQUIPMENT&SYSTEMS CO.,LTD.

## 3. MAJOR SAFETY DEVICES FOR AUTOMATIC SHUTDOWN

When any following safety device is worked, chiller automatically stops with buzzer sounds, and capacity control valve shall be fully closed. Activated error is indicated on the control panel by lamp.

## 1) INTERNAL SAFETY DEVICES

*CHW LOW FLOW	*CHW LOW TEMP.	*GH SOL. HIGH TEMP.	*GH HIGH PRESS.
*REF. LOW TEMP.	*CW HIGH TEMP.	*LOW COOLING CAPACITY	*SP OVER LOAD
*RP OVER LOAD	*CW LOW TEMP.	*CAPACITY VALVE FAILURE	*SSP OVER LOAD
*POWER FAILURE			

## 2) EXTERNAL SAFETY DEVICES

*EXTERNAL EMERGENCY STOP	*CHW PUMP INTERLOCK	*CW PUMP INTERLOCK
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## 4. SAFETY SYSTEMS

Following devices and equipments control chiller safely.

*GH DEW POINT TEMP. CONTROL	*GH SOL. TEMP. CONTROL
*REF. OVERFLOW	*SOL. OVERFLOW
*REF. LIQUID LEVEL	*RUPTURE DISK

## 5. PRE-ALARM

*TEMP. SENSOR FAILURE	*CW LTD
*INTERNAL HIGH PRESS.	*AUTO PURGE UNIT FAILURE
*ANNUNCIATION OF PARTS REPLACEMENT	

## 6. MATERIALS

COMPONENT	PART	MATERIALS	NOTES
		(ACCORDING TO GB or EQUIVALENT)	
EVAPORATOR ABSORBER	SHELL	Q235B(GB/T 3275)	CS
	TUBE PLATE	Q235B(GB/T 3275)	CS
	EVAP. TUBE	TP1 (GB/T17791, GB/T5231)	Copper
	ABS. TUBE	SUS316L(GB/T 12771)	SS
	WATER BOX	Q235B(GB/T 3275)	CS, Epoxy Painted
CONDENSER LOW TEMP. GENERATOR	SHELL	Q235B(GB/T 3275)	CS
	TUBE PLATE	Q235B(GB/T 3275)	CS
	COND. TUBE	SUS316L(GB/T 12771)	SS
	GENE. TUBE	SUS436L(GB/T 12771)	SS
	WATER BOX	Q235B(GB/T 3275)	CS, Epoxy Painted for condenser
HIGH TEMP. GENERATOR	SHELL	Q235B(GB/T 3275)	CS
	TUBE PLATE	Q235B(GB/T 3275)	CS
	TUBE	S22053(GB/T21832)	Stainless Steel Seamless
	STEAM BOX	Q345R (GB/T 713)	CS
SOL. HEAT EXCHANGER	FRAME		
	PLATE		
DRAIN HEAT EXCHANGER	FRAME		
	PLATE		



NO.	REVISIONS	DATE	BY
	DESCRIPTION		

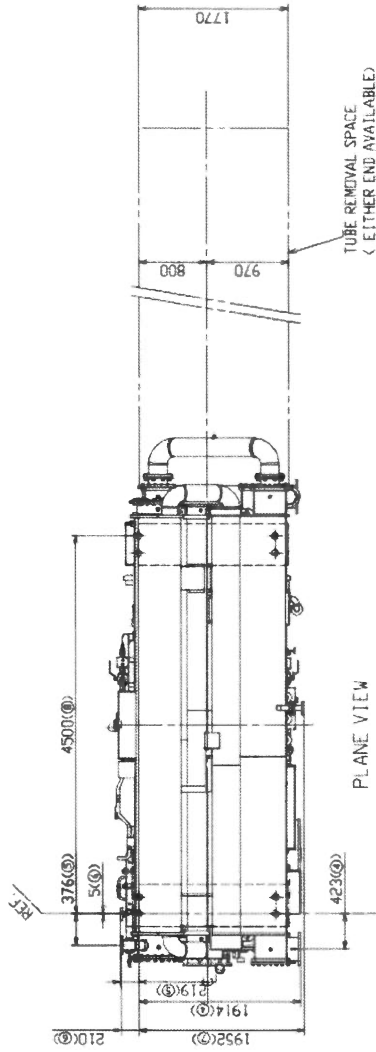


TABLE 2

1	CHILLED WATER INLET(10")
2	CHILLED WATER OUTLET(10")
3	COOLING WATER INLET(10")
4	COOLING WATER OUTLET(10")
5	STEAM INLET(4")
6	STEAM DRAIN OUTLET(2")
7	RUPTURE DISK(2")
8	ANCHOR BOLT HOLE(Ø45X8)

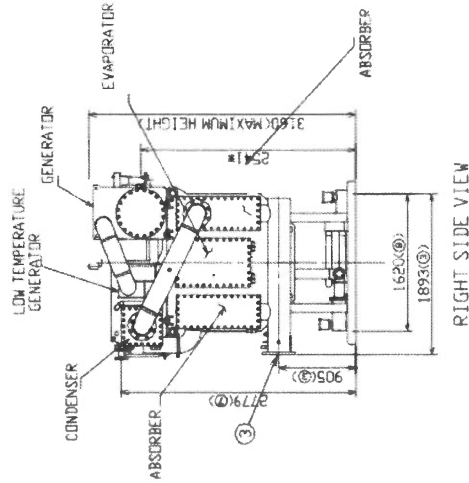
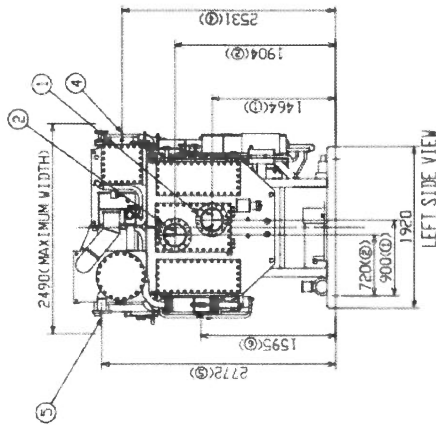
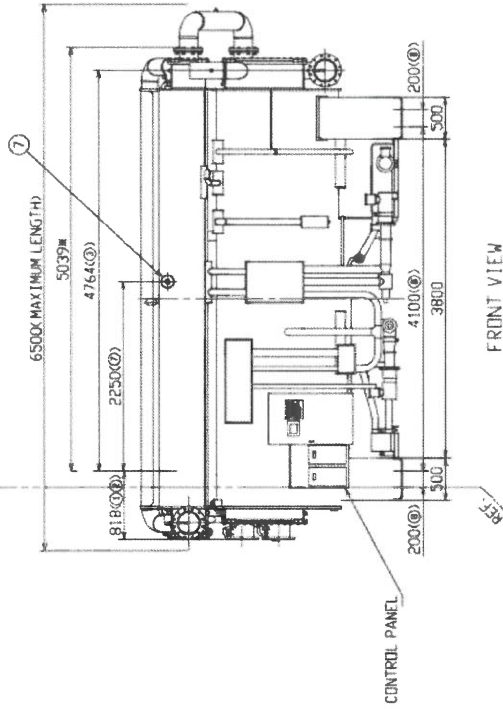


TABLE 1

SHIPPING WEIGHT	UPPER SHELL	16.4 ton
	BOTTOM SHELL	
OPERATING WEIGHT		19.2 ton

NOTE:  
 1. DIMENSION WITH MARK \* SHOWS CASE OF TWO PIECES SHIPMENT.  
 2. WEIGHT OF SOLUTION AND REFRIGERANT ARE NOT INCLUDED IN SHIPPING WEIGHTS.  
 3. WEIGHTS OF FLANGES ARE BASED ON HG STANDARD (GB/T 191-2010, 1.0 MPa) BUT THE FLANGES OF STEAM ARE BASED ON HG STANDARD (HG/T 20592-2009). COMPANION FLANGES SHALL BE PREPARED BY EMARA.

FIG. NO.	CUSTOMER
MODEL	SET TYPICAL ORDER
RGWA058B	
DESIGNED BY	DATE
CHECKED BY	DATE
Y. T. LI	DATE
TITLE	
ABSORPTION REF. MACHINE	
OUTLINE DIMENSIONS	
SCALE	DATE
1:1	
ENGBAR REFRIGERATION CO., LTD.	
EQUIPMENT & SYSTEMS	
ENG. NO.	REV.
RGWA058B-EY221A	0

REV.	REVISIONS	DATE	BY	APP.

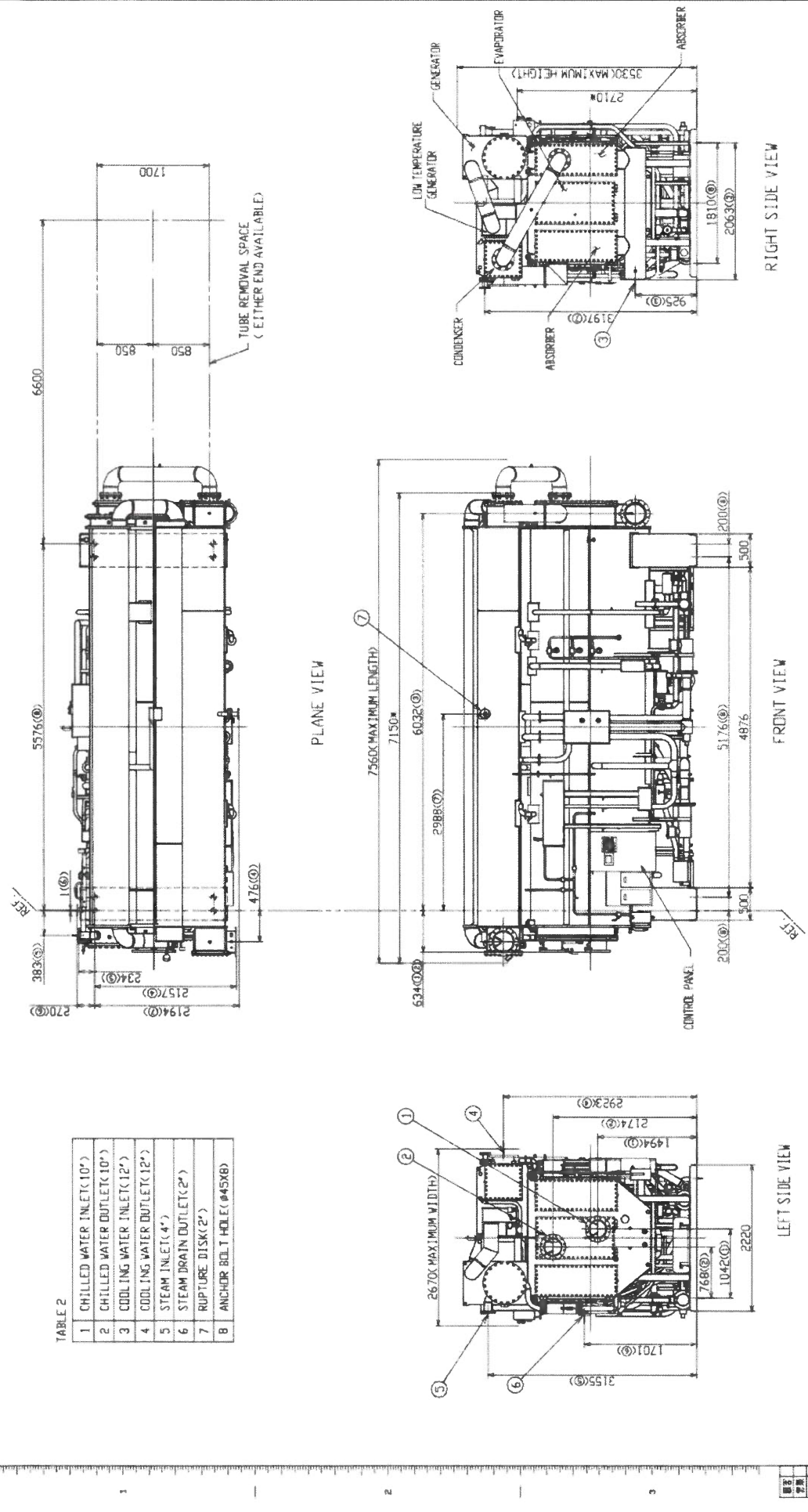


TABLE 2

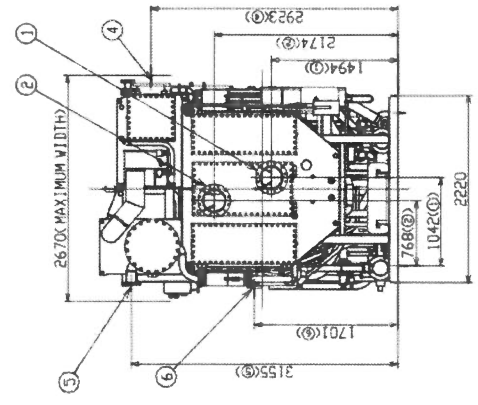
1	CHILLED WATER INLET(10")
2	CHILLED WATER OUTLET(10")
3	COOLING WATER INLET(12")
4	COOLING WATER OUTLET(12")
5	STEAM INLET(4")
6	STEAM DRAIN OUTLET(2")
7	RUPTURE DISK(2")
8	ANCHOR BOLT HOLE(Ø45X8)

REF. No. X  
MODEL: RGWA090B  
TITLE: ABSORPTION REF. MACHINE OUTLINE DIMENSIONS  
DRAWN BY: Y. T. L.  
CHECKED BY: V. B. S.  
DESIGNED BY: M. R. S.  
APPROVED BY: M. R. S.  
SET UP BY: M. R. S.  
CUSTOMER: X  
SET UP USER: X  
SCALE: 1:1  
SHEET No. 10  
TOTAL SHEETS: 10  
EBARA REFRIGERATION & CONTROL CO. LTD.  
RGWA090B-EY221A

NOTE:  
1. DIMENSION WITH MARK \* SHOWS CASE OF TWO PIECES SHIPMENT.  
2. WEIGHT OF SOLUTION AND REFRIGERANT ARE NOT INCLUDED IN SHIPPING WEIGHT.  
3. RATING OF ALL CONNECTING FLANGES ARE BASED ON GB STANDARD (GB/T9119-2010, 1.0 MPa) BUT THE FLANGES OF STEAM ARE BASED ON HG STANDARD (HG/T20592-2009). COMPANION FLANGES SHALL BE PREPARED BY EBARA.

TABLE 1

NUM. PIECES SHIPMENT	
ONE	TWO
UPPER SHELL	6.2ton
BOTTOM SHELL	14.6ton
OPERATING WEIGHT	28.3ton



LEFT SIDE VIEW

FRONT VIEW

PLANE VIEW

RIGHT SIDE VIEW

**Йотова, Цветелина А.**

---

**From:** Богоева, Юлия К.  
**Sent:** 15 май 2023 г. 15:57  
**To:** Йотова, Цветелина А.  
**Сс:** Александров, Пламен Г.; Лазарова, Милена Т.  
**Subject:** FW: Доставка на нови абсорбционни охладителни машини - пазарно проучване  
**Attachments:** Application 1 - RGW058B (2000 kW).pdf; Application 1 - RGW090B (3000 kW).pdf; Application 2 - Outline Dim. RGW058B.pdf; Application 2 - Outline Dim. RGW090B.pdf; Offer 47-23 NPP Kozloduy - 15.05.2023\_signed.pdf

BX-E-3061/15.05.2023

-----Original Message-----

From: Mihaela Velichkova <mihaela.velichkova@aircon-bg.com>  
Sent: Monday, May 15, 2023 2:59 PM  
To: commercial <commercial@npp.bg>  
Subject: Доставка на нови абсорбционни охладителни машини - пазарно проучване

Уважаеми Госпожи/Господа,

Във връзка с пазарна консултация № 51147 на АЕЦ Козлодуй за доставка на нови абсорбционни машини, Ви изпращаме нашето предложение за 4 бр. АОМ Ebara. Към него прилагаме и техническа спецификация за всяка от машините и чертежи с размерите.

Моля да потвърдите получаването на този мейл.

Благодаря Ви предварително!

--

Успешен ден

Mihaela Velichkova  
Office Administrator & Logistic Department

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22 Deveti Maj Str.  
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