

НА ВНИМАНИЕТО НА  
Г-Н ВАЛЕНТИН НИКОЛОВ  
Изпълнителен директор  
АЕЦ КОЗЛОДУЙ ЕАД



ВХ-Е-5908/ 03.010.2023 г.

Оферта № 47-23 / 1 NNP Kozloduy

Изх.№ 99

Дата: 02.10.2023 г.

Относно: Покана за пазарна консултация № 52197  
Доставка на нови абсорбционни охладителни машини

Уважаеми г-н НИКОЛОВ,

Във връзка с новата поканата за пазарна консултация № 52197, 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 оферта за доставка на нови абсорбционни охладителни машини, в съответствие с приложената Техническа спецификация към поканата, както следва:

1. 5,6 UX21H01 с охладителна мощност 3000kW (568.7 USRT)  $\pm$  10% - 2бр.
2. 5,6 UX11H01 с охладителна мощност 2000kW (568.7 USRT)  $\pm$  10% - 2бр

Въз основа на опита, който имаме от приблизително 18 годишна експлоатация и сервизно обслужване от наша страна, на действащите в момента абсорбционни охладителни машини в АЕЦ Козлодуй произведени от EBARA Corporation, имаме удоволствието отново съвместно с EBARA Corporation да Ви предложим най-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 абсорбционните машини.

Срокът за производство и доставка на абсорбционните 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 и Японска банка на виждане при отваряне на поръчката.



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Leading Innovation >>>

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Приблизителната цена, само за доставка на четирите абсорбционни охладителни машини, описани в настоящата покана за пазарна консултация към настоящия момент е в размер на 2 120 000.00 (два милиона сто и двадесет хиляди щатски долара) USD

Цената е направена при среден официален обменен курс 1.00 USD = 136.10 JPY при диапазон (1.00 USD = 136.02-140.18 JPY). При промяна на цената на обменният курс в посочените граници, цената ще се ревизира преди откриването на L/C.

Посочената цена е само за доставка на машините, тъй като към насоящия момент не можем да оферираме всички дейности свързани с проектни разработки, демонтаж на съществуващото оборудване в т.ч. стари абсорбционни охладителни машини и съпътстващо оборудване като - циркуляционни помпи, водни филтърни групи, съпътстващи тръбопроводи и оборудване за пара, кондензно стопанство, както и монтаж на новите абсорбционни охладителни машини.

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, което ще се оферира допълнително, въз основа на одобрен график за изпълнението на обекта.

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 4бр. абсорбционни охладителни машини ще удовлетвори Вашите изисквания.

За всяка допълнителна информация 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.



REV.	DESCRIPTION	DATE	BY	APP.

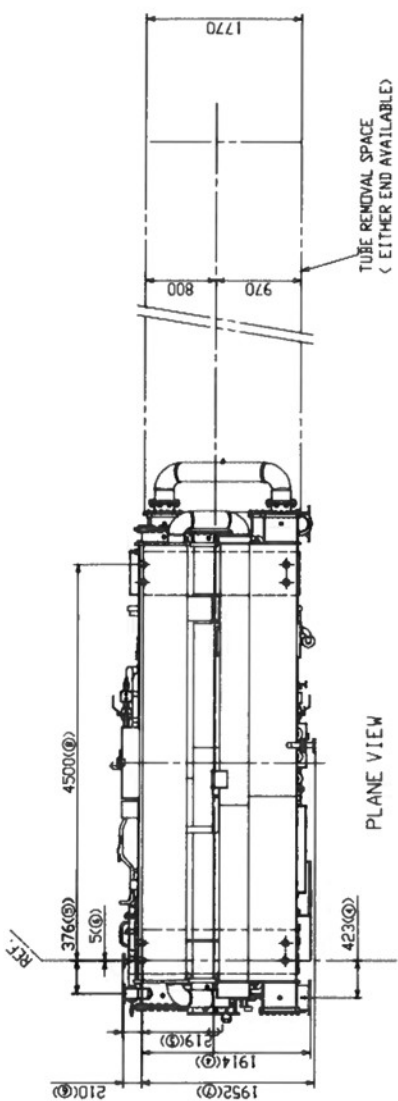


TABLE 2

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)

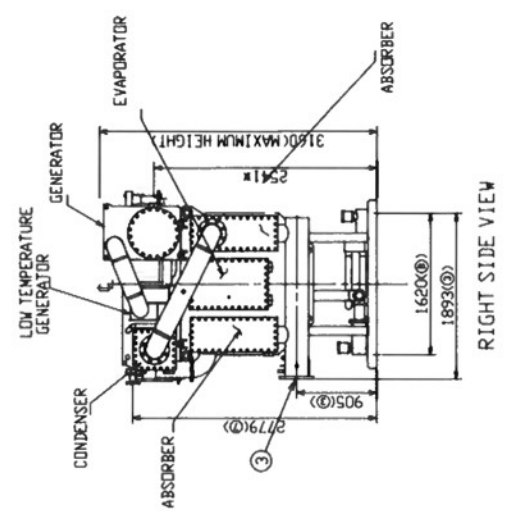
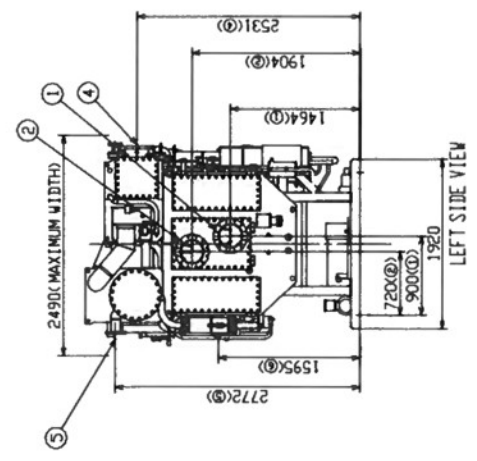
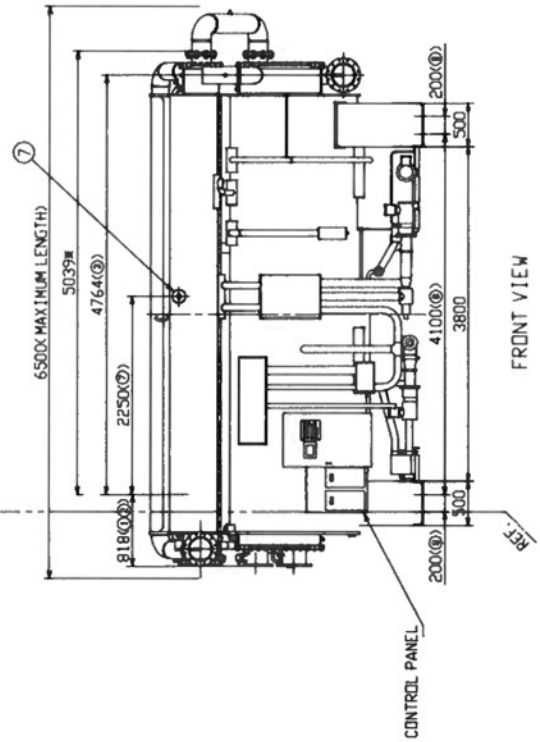


TABLE 1

NUM. PIECES SHIPMENT	
ONE	TWO
UPPER SHELL	16.4-ton
BOTTOM SHELL	19.2-ton
SHIPPING WEIGHT	
OPERATING WEIGHT	

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 UPPER AND LOWER SHELLS ARE BASED ON 100% CHARGING TO SATURATION BUT THE FLANGES OF STEAM ARE BASED ON 40% SATURATION (40% TROSSP-2009). COMPANION FLANGES SHALL BE PREPARED BY EBARA.

FIG. No. CUSTOMER  
MODEL: RQWA058B SET/FINAL USER  
TITLE: ABSORPTION REF. MACHINE OUTLINE\_DIMENSIONS  
DRAWN BY: L. C. L.V. CHECKED BY: T. T. L.T.  
DATE: 08.08.18  
PROJECT NO. RGWA058B-EY221A



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

2) EXTERNAL SAFETY DEVICES

- \*EXTERNAL EMERGENCY STOP
- \*CHW PUMP INTERLOCK
- \*CW PUMP INTERLOCK

4. SAFETY SYSTEMS

Following devices and equipments control chiller safely.

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

5. PRE-ALARM

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

## 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		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
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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 (ACCORDING TO GB or EQUIVALENT)	NOTES
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		