

SASAKURA

Fresh Water Generator

Series **K**



SASAKURA
ENGINEERING CO.,LTD.

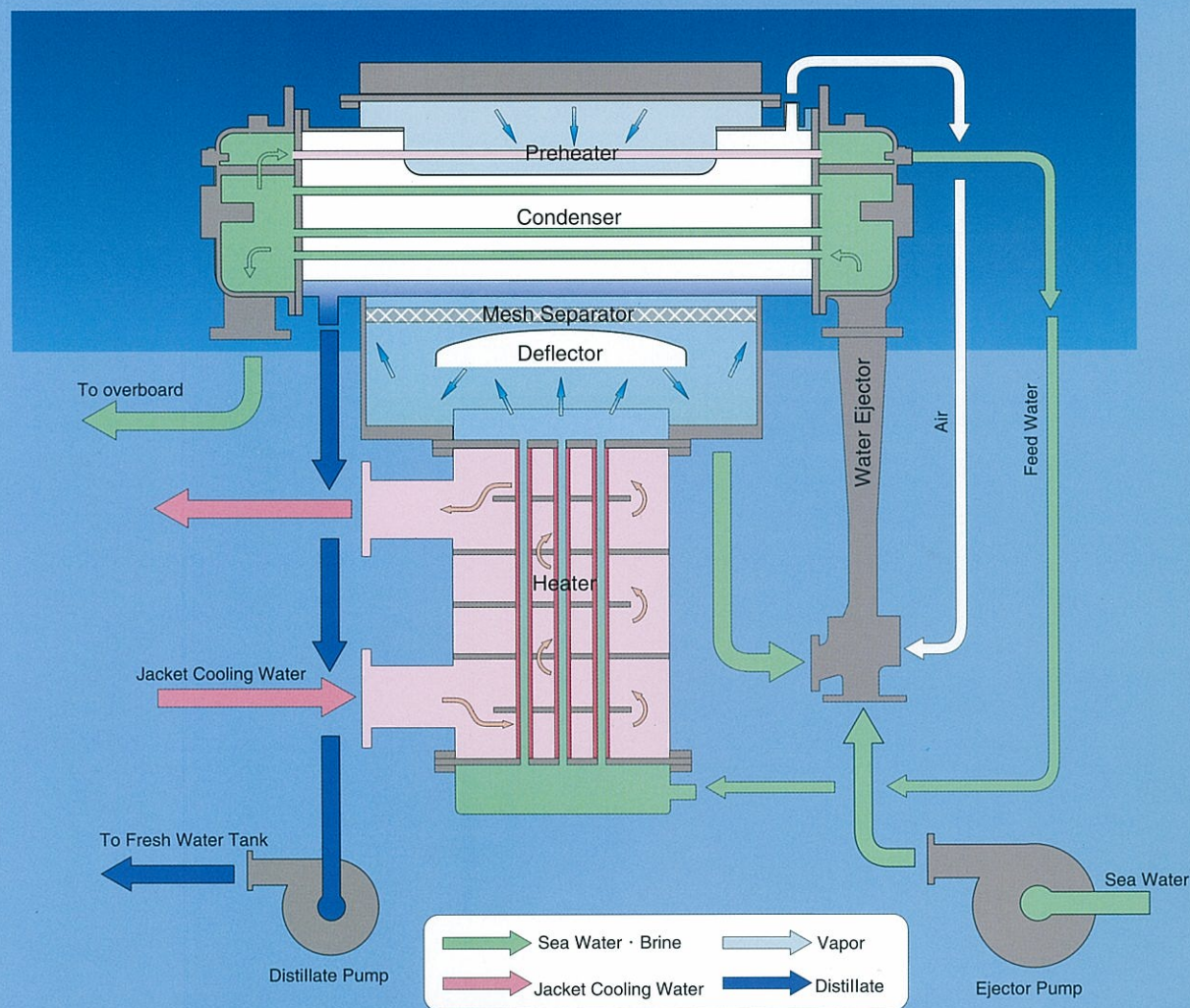
SASAKURA Fresh Water Generator

Series KE, KM & K produces distilled water of high purity by making use of jacket cooling water from diesel engines. Energy saving performance and compact design achieved by feed water preheater.

Since its foundation in 1949, SASAKURA has steadily accumulated special technological expertise in the manufacture of marine Fresh Water Generator. In order to keep pace with the changing needs of the times, SASAKURA has engaged in a continuous program of research and development.

The SASAKURA Series KE, KM and K Fresh Water Generators are the latest model that have even better performance and reliability developed through our technical experience acquired since we started production of marine Fresh Water Generators in 1961.

Series KE, KM and K are the most ideal Fresh Water Generators for diesel driven ships and are far superior to any other similar Fresh Water Generators because of its highest-ever performance, reliability, easy operation and maintenance.



The Process

The Fresh Water Generator utilizes the heat from diesel engine jacket cooling water to produce high purity distillate by evaporating sea water under a high vacuum (low temperature) condition. Steam can also be used as the heat source instead of the hot jacket water.

- The Evaporator Chamber is kept under vacuum by a Water Ejector. Seawater supplied by Ejector Pump drives Water Ejector, and enters into the Tubes of Condenser as a cooling medium, then is discharged overboard.
- Part of the jacket cooling water (fresh water) circulates to the outside of the

heater tubes, giving up some of its heat to the sea water which flows inside the tubes.

- The heated sea water (feed water) evaporates as it enters the main chamber due to the vacuum condition. Water droplets are removed from the vapor by the deflector and the mesh separator. The separated droplets fall back into the brine, which is extracted from the chamber and discharged overboard.
- The vapor passes to the condenser tube bundle which is cooled by sea water flowing inside the tubes. The condensed vapor is collected and pumped to the

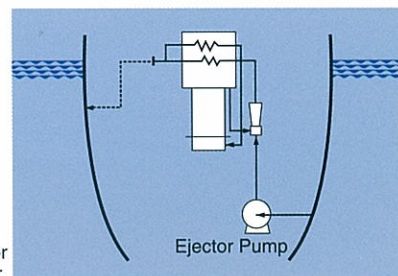
fresh water storage tank by the distillate pump.

- The sea water used in the condenser becomes warmed up as the vapor gives up its heat of condensation. Part of this warm sea water is used as the feedwater to the Fresh Water Generator.
- The salinity of the distillate is monitored by a conductivity detector. If the salinity exceeds the specified level, the solenoid valve in the discharge line of the distillate pump is automatically activated and the faulty distillate is returned to the brine side of the evaporation chamber.

SASAKURA Fresh Water Generators Series KE, KM & K

KE_{Type}

- Ejector pump of KE Type supplies cooling water as well as ejector water, which saves piping cost and reduces seawater service pump capacity.



Ejector pump supplies ejector water and cooling water.

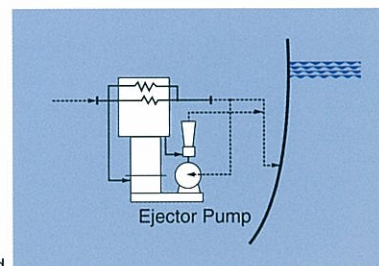
Technical Specifications Type KE

Item	Type	KE3	KE5	KE10	KE15	KE20	KE25	KE30	KE35	KE40	KE50
Capacity	t/24h	3	5	10	15	20	25	30	35	40	50
Salinity of distillate	ppm	※ Below 10									
Heat consumption	× 10 ³ kcal/h	73	121	242	362	484	606	726	846	967	1203
	kw	85	141	282	421	563	705	845	984	1124	1399
Cooling Seawater Temperature	℃	32									
Jacket Cooling Water	Quantity T/h	6.4	13	26	37	54	56	69	80	85	93
	Temperature Inlet ℃	80									
	Temperature Outlet ℃	68.7	70.6	70.7	70.2	71.1	69.2	69.4	69.4	68.6	67.1
Distillate Pump	Capacity m³/h	0.3		1.2				2.5			
	Total Head m	20		30							
	Speed rpm	3450									
	Motor Output kw	0.4		0.75				1.5			
Ejector Pump	Capacity m³/h	10		24	33	42	60	75		90	120
	Total Head m	48									
	Speed rpm	3450									
	Motor Output kw	3.7		7.5	11.0		15.0	18.5		22.0	30.0
Power Source	Motor	AC440V 60Hz 3Phase									
	Salinity Indicator	AC100~220V 60Hz 1Phase									
Ejector		1 Unit									

※ Salinity of less than 2 ppm can be guaranteed for special orders.

KM_{Type}

- Ejector pump & motor is installed on the same basement of Fresh Water Generator, which saves installation cost and enables easy operation.

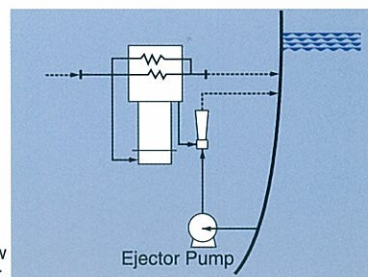


Ejector pump & motor is preinstalled.

Technical Specifications Type KM

Item	Type	KM10	KM15	KM20	KM25	KM30	KM35	KM40	KM50	KM60	
Capacity	t/24h	10	15	20	25	30	35	40	50	60	
Salinity of distillate	ppm	※ Below 10									
Heat consumption	×10 ³ kcal/h	242	362	485	606	727	847	968	1203	1443	
	kw	282	421	564	705	845	985	1125	1399	1679	
Cooling Seawater	Quantity	T/h	21	32	46	60	70	78	87	115	125
	Temperature Inlet	℃	32								
	Temperature Outlet	℃	43.2	43.0	42.2	41.8	42.0	42.5	42.8	42.3	43.3
Jacket Cooling Water	Quantity	T/h	28	38	46	56	73	75	83	93	112
	Temperature Inlet	℃	80								
	Temperature Outlet	℃	71.4	70.4	69.5	69.1	70.0	68.6	68.4	67.0	67.1
Distillate Pump	Capacity	m ³ /h	1.2			2.5					
	Total Head	m	30								
	Speed	rpm	3450								
	Motor Output	kw	0.75				1.5				
Ejector Pump	Capacity	m ³ /h	10	18		24			36		
	Total Head	m	39								
	Speed	rpm	3450								
	Motor Output	kw	3.7	5.5					7.5		
Power Source	Motor	AC440V 60Hz 3Phase									
	Salinity Indicator	AC100~220V 60Hz 1Phase									
Ejector		1 Unit									

※ Salinity of less than 2 ppm can be guaranteed for special orders.



The ejector pump is located below the Fresh Water Generator.

Technical Specifications Type K

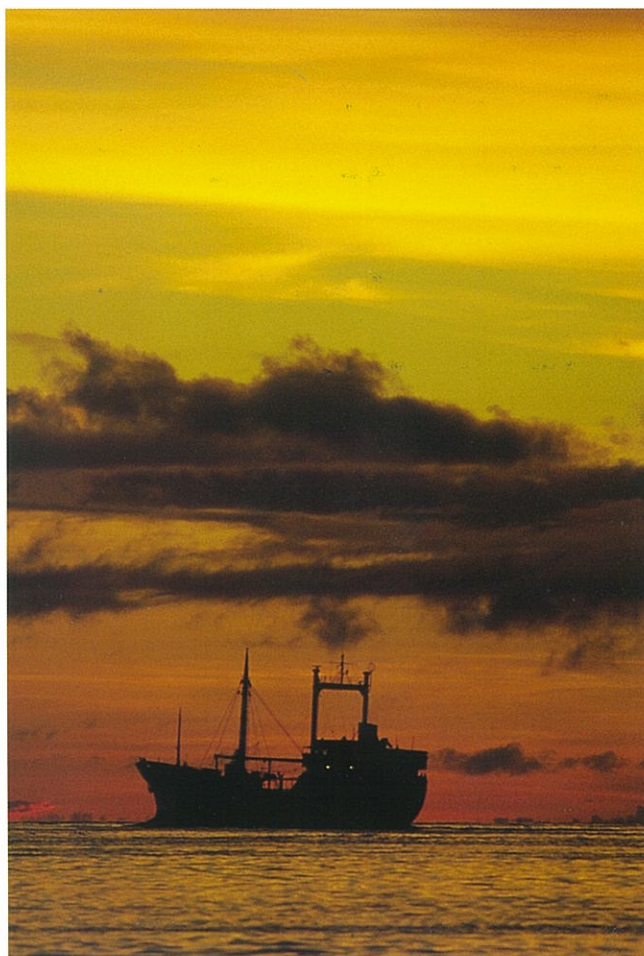
Item	Type	K10	K15	K20	K25	K30	K35	K40	K50	K60	
Capacity	t/24h	10	15	20	25	30	35	40	50	60	
Salinity of distillate	ppm	※ Below 10									
Heat consumption	× 10 ³ kcal/h	242	362	485	606	727	847	968	1203	1443	
	kw	282	421	564	705	845	985	1125	1399	1679	
Cooling Seawater	Quantity	T/h	21	32	46	60	70	78	87	115	
	Temperature Inlet	℃	32								
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Jacket Cooling Water	Quantity	T/h	28	38	46	56	73	75	83	93	112
	Temperature Inlet	℃	80								
	Temperature Outlet	℃	71.4	70.4	69.5	69.1	70.0	68.6	68.4	67.0	67.1
Distillate Pump	Capacity	m³/h	1.2			2.5					
	Total Head	m	30								
	Speed	rpm	3450								
	Motor Output	kw	0.75				1.5				
Ejector Pump	Capacity	m³/h	10	18		24			36		
	Total Head	m	48								
	Speed	rpm	3450								
	Motor Output	kw	3.7	5.5			7.5			11.0	
Power Source	Motor	AC440V 60Hz 3Phase									
	Salinity Indicator	ACI00~220V 60Hz 1Phase									
Ejector		1 Unit									

※ Salinity of less than 2 ppm can be guaranteed for special orders.

Principal Materials

Equipment	Parts	Materials
Heater	Heating Tube	Aluminum Brass
	Tube Plate	Naval Brass
Condenser	Heating Tube	Aluminum Brass
	Tube Plate	Naval Brass
Vapor Chamber	Mesh Separator	Stainless wire
	Deflector	F.R.P.
Water Ejector	Casing	Phosphor Bronze
	Diffuser	Phosphor Bronze
	Nozzle	Stainless Steel

※ Copper-nickel tube or Titanium tube is available for special orders.

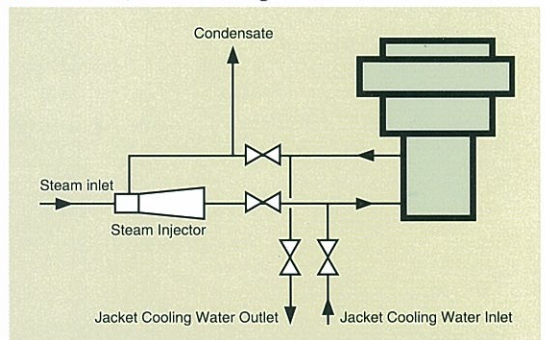


Operation using Steam Injector

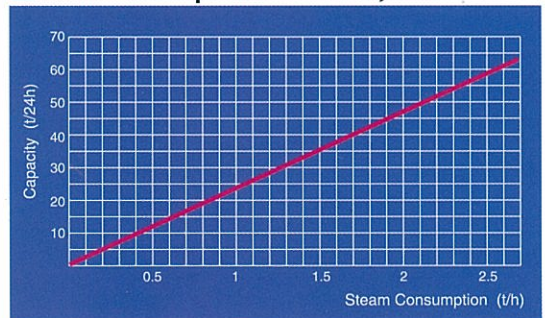
Even when jacket cooling water from the diesel engine is unavailable because of the vessel being at anchor, the Fresh Water Generator can be operated by a Steam Injector using heating steam.

- When heating steam at the specified pressure is fed into the Steam Injector, it supplies heat to the feed water by the dual function of heating and forced circulation.
- The condensing steam supplies heat to the circulating water and the excess condensate is discharged as a drain.
- The operation of the cooling seawater, brine, air and product water line system is the same as when using the main engine cooling water.
- The allowable range of the driving steam pressure is 4kgf/cm²G minimum and 10kgf/cm²G maximum.

Steam Injector Arrangement



Steam Consumption of Steam Injector



The Features

High Purity Distillate

The evaporation chamber contains a deflector plate and a mesh separator for removing fine spray droplets. This unique and simple arrangement ensures a continuous production of high purity distillate.

Simple Operation

Start up and shutdown are simple procedures. Only push the start and stop buttons to operate. Once the plant is running it continues in stable operation with hardly any attention. The process is completely stable and requires no critical controls or monitoring, so can safely be left unattended for long periods of time.

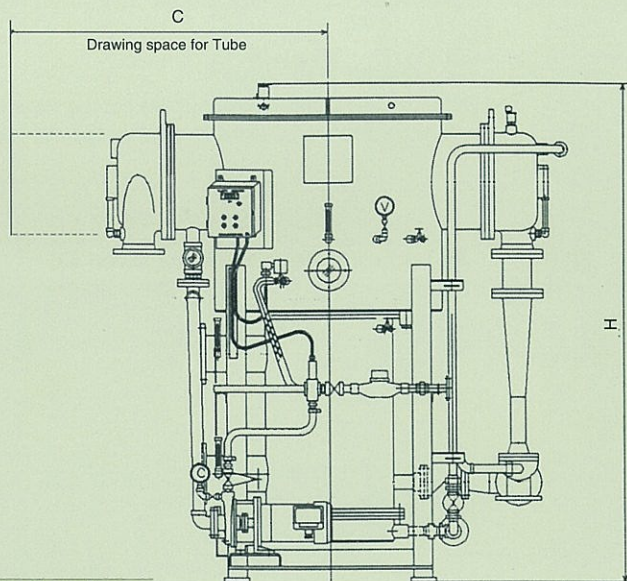
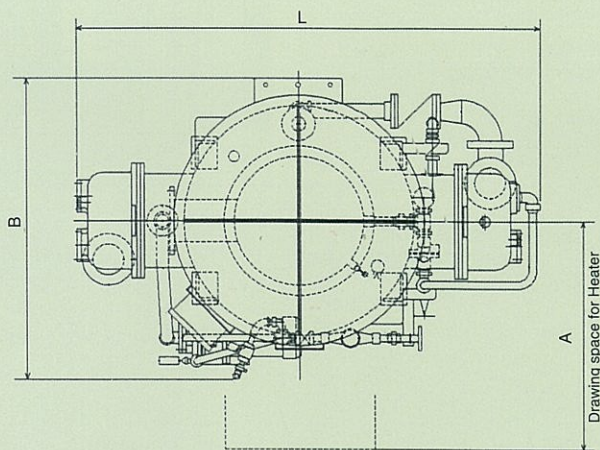
Scale-free Performance

The Fresh Water Generator operates under vacuum to give a low working temperature below the normal threshold for scale precipitation. The vertical arrangement of the tubes in the heater ensures that there can be no localized regions of high brine concentration. By having the seawater inside the heater tubes and the fresh water on the outside, the residence time of the seawater in contact with the heating surface area is reduced. All these factors contribute to maintaining the performance for long periods before any cleaning is needed.

High reliability

High reliability fully proven with almost 10,000 installations all over the world.





■ Dimension List

Type	Mark	L	B	H	C	A	Empty (kg)	In Opetation (kg)	Ejector Pump set (kg)
KE3		1250	820	1450	1210	700	310	350	90
KE5		1360	820	1560	1250	700	340	380	90
KE10		1625	920	1660	1300	850	550	645	110
KE15		1595	1080	1760	1650	1000	740	865	160
KE20		1820	1150	1860	1890	1100	840	1005	200
KE25		1820	1200	1910	1890	1150	955	1155	200
KE30		1820	1260	1980	1920	1200	1140	1375	210
KE35		1910	1270	2000	2000	1300	1245	1530	210
KE40		2030	1300	2010	2100	1350	1315	1635	320
KE50		2180	1450	2080	2270	1480	1480	1850	450

SASAKURA Plate Type Fresh Water Generator "AQUARIO"

 **FujiMetallock**
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