



FLASH STEAM AND WASTE WATER HEAT EXCHANGERS

**SR-3/SR-8
SR-B1.5/SR-B4**

- Eliminate “steam clouds” and recover heat energy!
- Deliver energy savings by heating supply water with high-temperature waste water!



Effective use of heat energy generated by waste steam clouds and boiler blowdown

In steam-using plants, flash steam from condensate receivers and supply water tanks and waste steam from production processes often still contain significant heat energy but are simply discharged to atmosphere. These "steam clouds" contribute to a poor work environment and can lead to trouble with local residents. Likewise, high-temperature water from boiler blowdown lines and other unusable water is still a viable source of heat energy, but is often discharged to pits, energy and all. The SR and SR-B series are atmospheric indirect heat exchangers that recover discarded heat energy as hot water, and enable the use of recovered energy for heating boiler supply water and other applications. Furthermore, those troublesome "steam clouds" are also eliminated.

**Eliminate
"Steam Clouds"
from
Facilities**

**Energy
Savings
via Heat
Recovery**

**Large Degree
of Freedom
for Installation**

The product can be easily introduced as it is an open-to-atmosphere system free from the restrictions and regulations governing pressure vessels.

**All Stainless
Steel Indirect
Heat Exchanger**

Clean, hot water supplied from stainless steel heat exchanger coil tube

**Useful for Various
Applications**

Almost no back pressure (maximum of 50 mmAq) to steam-using equipment, so it can be used for a variety of processes

- High heat exchange efficiency comparable to closed type heat exchangers
- Compact, space-saving design
- Economical, requiring no electrical power

Steam Condensing Heat Exchanger SR-3/SR-8

Eliminate "steam clouds" and recover heat energy as hot water

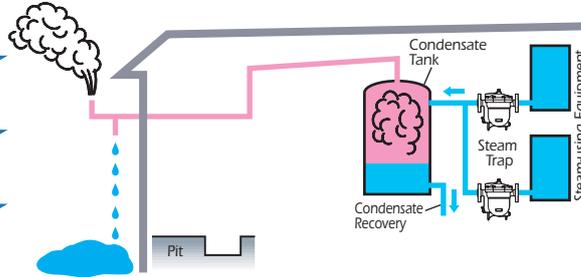
- Hot water generated by SR series is suitable for cleaning/preheating water for production processes, bottle washing and other post-production cleaning applications
- Unique structure that does not apply pressure makes recovery of atmospheric pressure steam possible

Before Installation

Negative effects of steam clouds on bldg./equipment

Bad image to local residents

Loss of actually usable energy (waste steam)

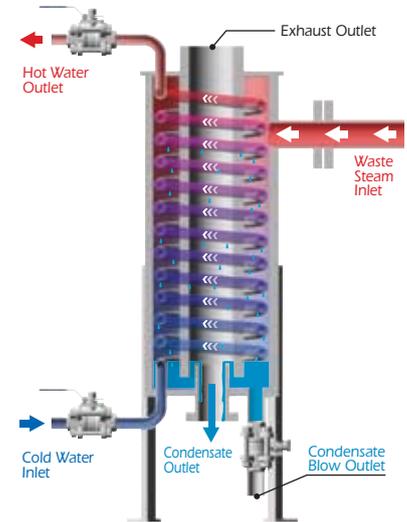
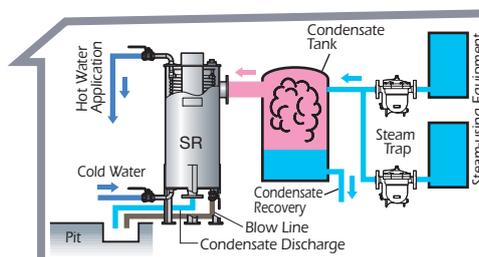


After Installation

Steam cloud elimination

Hot water utilization

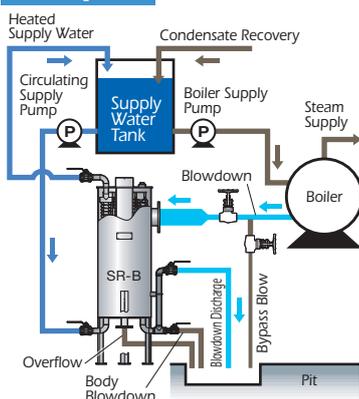
Energy savings via heat energy (waste steam) use



High-temperature Waste Water Heat Exchanger SR-B1.5/SR-B4

Heat exchange between discarded boiler blowdown and boiler supply water, increasing the supply temperature and reducing fuel costs

Example 1



Case Study

Heat Recovered

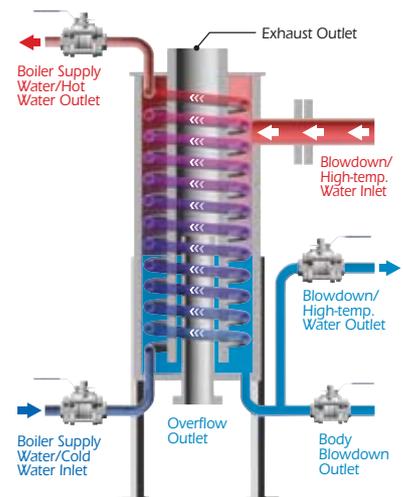
Approx. **460 MJ per hour**

Savings

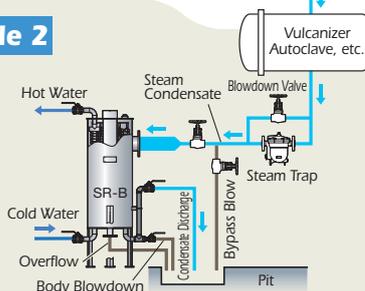
Approx. **39,700 USD per year**

Operating Conditions

Boiler Pressure: 0.8 MPaG Steam Generation Rate: 15 t/h
 Blowdown Rate: 6% Supply Water Temp.: 40 °C
 Fuel Cost: 0.012 USD per MJ Annual Oper. Time: 7,200 h/y



Example 2



Heat recovery from high-temperature water 100 °C or more which is unsuitable for condensate recovery

- Suitable for cleaning/preheating water for production processes, bottle washing and other post-production cleaning applications (Heat recovery from vulcanizers, autoclaves, and sterilizers etc.)

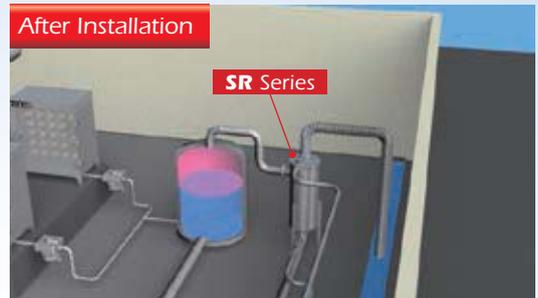
Example

Indoor Condensate Tanks

- Heat recovery from flash steam
- Steam cloud elimination



A condensate tank vented to atmosphere generates flash steam. Pressure cannot be applied to the tank, so conventional heat exchangers cannot be used.



SR steam condensing heat exchanger has a small footprint, while being able to handle the flash steam generated by the condensate tank. SR recovers heat and eliminates steam clouds, while improving the work environment.

Once-through Boilers

- Heat recovery from waste water
- Steam cloud elimination



Boiler blowdown is hot and contains significant amounts of energy, however conventional heat exchangers are difficult to implement since they add back pressure to the boiler, therefore blowdown into a pit is more common.



SR-B high-temperature waste water heat exchanger offers very little back pressure, handles blowdown and flash steam at the same time and exchanges heat with boiler supply water, raising its temperature. SR-B recovers heat and eliminates steam clouds simultaneously.

Specifications

Steam Condensing Heat Exchanger			High-temperature Waste Water Heat Exchanger		
Model	SR-3	SR-8	Model	SR-B1.5	SR-B4
Steam Inlet Connection	ASME Class 150 RF		Blowdown/High-temp. Water Inlet Connection	ASME Class 150 RF	
Size	80	150	Size	80	150
Material Body	Stainless Steel SUS304		Material Body	Stainless Steel SUS304	
Material Heat Exchanger	Stainless Steel SUS304		Material Heat Exchanger	Stainless Steel SUS304	
Max. Steam Flow Rate*2	300 kg/h	800 kg/h	Max. Blowdown/High-temp. Water Flow Rate*1 *2	1,000 kg/h	2,400 kg/h
Applicable Fluid	Steam		Applicable Fluid	Boiler Blowdown, Waste Water at 100 °C or more	
Max. Heat Recovery Capacity*3	670 MJ/h	1,800 MJ/h	Max. Heat Recovery Capacity*3	520 MJ/h	1,250 MJ/h
Heat Transfer Surface Area	2.0 m ²	5.4 m ²	Heat Transfer Surface Area	2.0 m ²	5.4 m ²
Max. Operating Water Pressure	1.0 MPaG		Max. Operating Boiler Supply/High-temp. Water Pressure	1.0 MPaG	
Max. Operating Water Temp.	100 °C		Operating Boiler Supply/High-temp. Water Temp.	100 °C	

1 MPa = 10.197 kg/cm²

*1 The amount of blowdown/high-temperature water before re-evaporation. *2 For cold water at 20 °C or boiler supply water.

*3 SR: For heat exchange with steam at atmospheric pressure and cold water at 20 °C.

SR-B: For heat exchange with blowdown/high-temp. water at 160 °C and cold water at 20 °C.

Applications

SR-3/SR-8

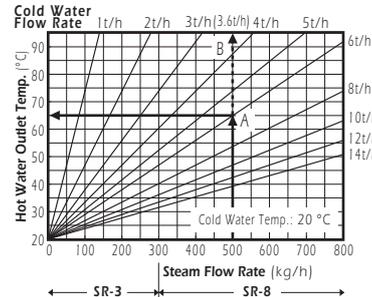
- Heat recovery from steam in processes to where pressure cannot be applied (Waste steam heat recovery from steamers, set machines, etc.)
- Treatment of re-evaporated steam from supply water/condensate tanks
- Improving work environment where steam clouds are generated around the plant

SR-B1.5/SR-B4

- Heating boiler supply water with water from continuous blowdown
- Heat recovery from high-temperature water at 100 °C or more which is unsuitable for condensate recovery (Heat recovery from vulcanizers, autoclaves, and sterilizers etc.)
- Improving work environment where steam clouds are generated around the plant

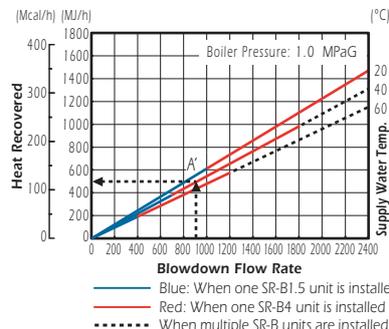
Waste heat recovery performance graphs

SR-3/SR-8



- The graph to the left shows the relationship between the amount of steam passing through the heat exchanger and the temperature of the hot water outlet after cold water at 20 °C has been heated. Consult TLV when the cold water temperature is not around 20 °C.
- When the outlet water temperature exceeds 95 °C, steam cannot be condensed and will be discharged from the exhaust outlet.
Example: For 500 kg/h waste steam, 6 t/h cold water
• At the intersection A on the graph, 500 kg/h of waste steam is collected and 6 t/h of water is used for heat recovery. Moving left from this point reveals that hot water at 65 °C can be recovered with the SR-8.
• Moving up to point B reveals that 3.6 t/h of cold feed water will be required. If less is used, some waste steam will remain uncondensed.

SR-B1.5/SR-B4



- The graph shows the obtainable amounts of recoverable heat for blowdown and supply water at 20, 40 and 60 °C.
Example: For 1.0 MPaG boiler pressure, 40 °C supply water and 900 kg/h of blow water before re-evaporation
• Moving left from intersection A' on the graph (900 kg/h blowdown, 40 °C supply water), it is revealed that 500 MJ/h of heat energy can be recovered.
• Point A' is on the red section of the line, therefore SR-B4 can be used.
NOTE: The graph to the left is one example of possible heat recovery.
For more information, see the SR-B specification data sheet (SDS).

NOTE: Specifications subject to change without notice.



CAUTION

To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

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is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001
ISO 14001

