HIGH-TEMPERATURE WASTE WATER HEAT EXCHANGER

MODEL SR-B1.5/SR-B4

HIGH-PERFORMANCE ATMOSPHERIC HEAT EXCHANGER FOR WASTE HEAT RECOVERY

Features

Atmospheric indirect heat exchanger for recovering heat energy from high temperature waste water of 100 °C or more from applications where it cannot otherwise be utilized.

1. Open to atmosphere system adds very little back pressure to steam-using equipment (maximum 50 mm water head).
2. Indirect heat exchanger made of stainless steel including the coil tube in the heat-exchange section.
3. High heat exchange efficiency comparable to closed type heat exchangers.
4. Compact, space-saving design.
5. Requires no electric power, providing very high economic efficiency.
6. Utilizes the energy from high-temperature condensate 100 °C or more unsuitable for condensate recovery to heat water for reuse.
7. Waste heat recovery generated from steam-using equipment.
8. Improves work environment by eliminating clouds of steam generated around the plant.

Specifications

Model		SR-B1.5	SR-B4
Connection & Size (mm)	High-Temp. Water Inlet	80 Flanged	150 Flanged
	High-Temp. Water Outlet	25 Screwed	40 Screwed
	Overflow Outlet	50 Flanged	
	Body Blowdown Outlet	25 Screwed	
	Cold Water Inlet	20 Screwed	40 Screwed
	Hot Water Outlet	20 Screwed	40 Screwed
	Exhaust	150 Pipe End (ASME flanged connection available as option) (Duct nipple installable) Flanged: JIS10KFF (Optional)	
	Overflow Outlet for Exhaust Pipe	10 Screwed	
Applicable Fluids		Hot Water	
Maximum Operating Pressure (MPaG) PMO		Body (shell side): 0[1] Coil (tube side): 1.0	
Maximum Operating Temperature (°C) TMO		up to 100[1]	
Maximum High Temperature Water Flow Rate (kg/h)[2]		1000	2400
Maximum Heat Recovery Capacity (MJ/h)[3]		520	1250
Heat Transfer Surface Area (m^2)		2.0	5.4

Contact TLV for non-standard design specifications

1 MPa = 10.197 kg/cm^2

PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS): Maximum Allowable Pressure (MPaG) PMA: Body: 0.05, coil: 2.0
Maximum Allowable Temperature (°C) TMA: Body: 158, coil: 180

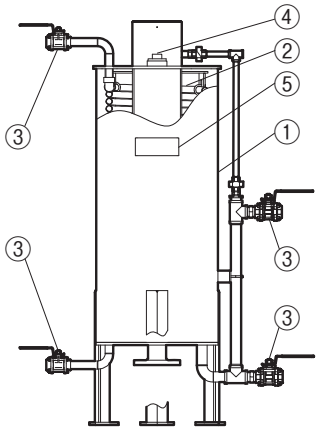
[1] Even if the pressure and temperature of the high temperature water exceed the PMO/TMO before re-evaporation, the interior of the heat exchanger will be at nearly atmospheric pressure and 100 °C or less if within the maximum processing rate.
[2] The amount of high temperature water before re-evaporation.
[3] For heat exchange with high-temp. water at 160 °C and cold water at 20 °C.

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.

Configuration

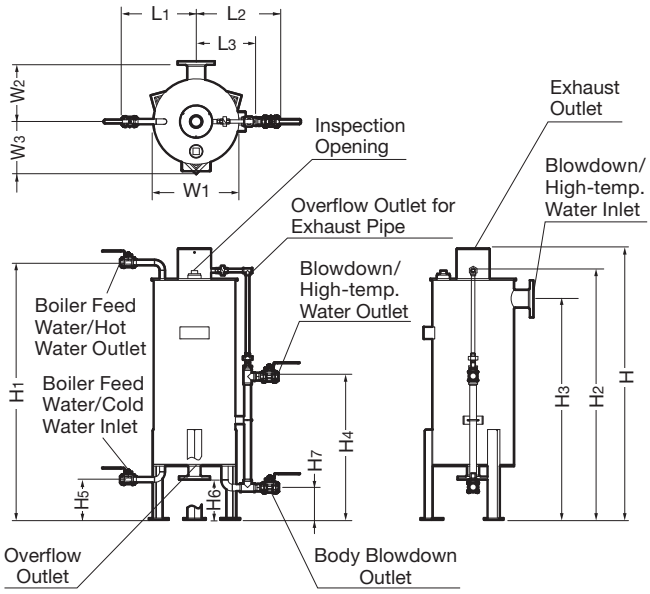
No.	Description	Material	JIS	ASTM/AISI*
①	Body	Stainless Steel	SUS304	AISI304
②	Heat Transfer Coil	Stainless Steel	SUS304	AISI304
③	Full-bore Ball Valve BV1	Cast Stainless Steel	—	A351 Gr. CF8
④	Plug	Stainless Steel	SUS304	AISI304
⑤	Nameplate	Stainless Steel	SUS304	AISI304

* Equivalent



Dimensions

● SR-B1.5 / SR-B4



SR-B1.5 / SR-B4

(mm)

Model	L_1*	L_2*	L_3*	H	H_1	H_2	H_3	H_4
SR-B1.5	370	420	290	1350	1280	1240	1100	715
SR-B4	420	515	355	1850	1790	1740	1550	900

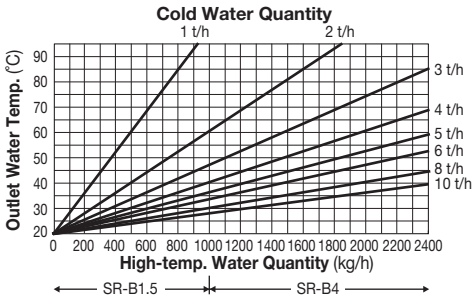
Model	H_5	H_6	H_7	ϕW_1	W_2	W_3*	Weight* (kg)	
							Empty	Full
SR-B1.5	200	200	160	426	300	260	140	210
SR-B4	320	350	320	528	350	310	250	370

* Approximate
Flanged connections are ASME Class 150 RF.
Screwed connections are NPT except on inspection opening (Rc(PT) 2)
Other standards available

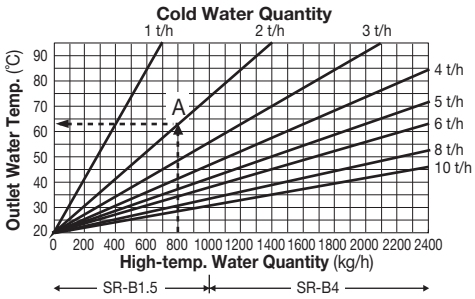
⚠ CAUTION In case of unexpected steam flow, connect piping from the exhaust outlet to a safe area. Unexpectedly high steam volumes may cause high-temperature condensate to be discharged through the exhaust outlet, which may in turn cause burns or other injury.

Waste Heat Recovery

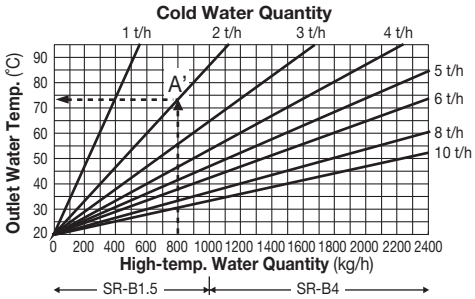
● Waste high-temp. water: 110 °C



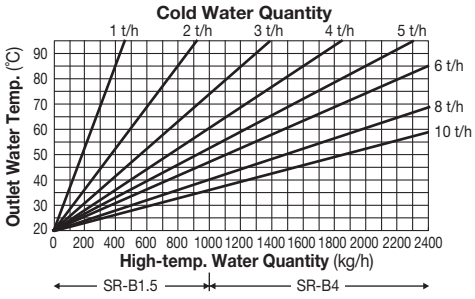
● Waste high-temp. water: 140 °C



● Waste high-temp. water: 170 °C



● Waste high-temp. water: 200 °C

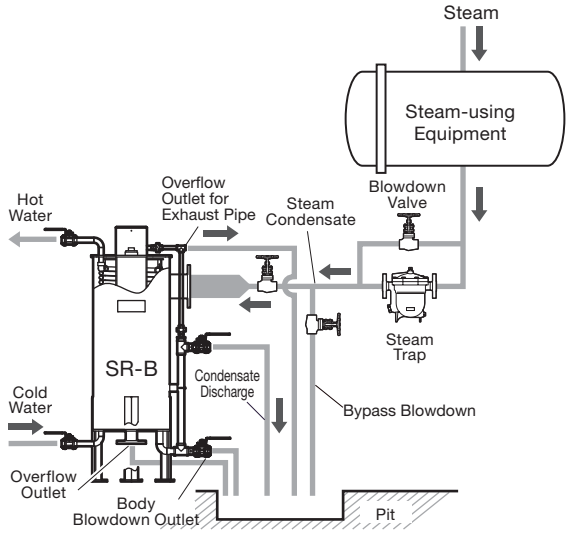


How to calculate the outlet water temperature from the graph

■ Waste high-temp. water*: 150 °C, waste high-temperature water quantity: 800 kg/h, cold water quantity: 2 t/h, when heating cold water at 20 °C
* Temperature and amount of waste high-temperature water before re-evaporation

1. As the waste high-temperature water is 150 °C, the hot water outlet temperature will be calculated using the graphs for 140 °C and 170 °C. (Consult TLV if the waste high-temperature water temperature is outside the graph range.)
2. Find points A and A' on each graph between the waste high-temperature water quantity (800 kg/h) and the cold water quantity (2 t/h). Move left from these points to find outlet water temperatures of 63 °C and 73 °C. Based on the locations of A and A', SR-B1.5 should be selected.
3. Divide the two outlet water temperatures (63 °C and 73 °C) into the corresponding waste hot water temperature (150 °C).
   (73 - 63) × (150 - 140) / (170 - 140) + 63 = 66.3
   This gives an outlet water temperature of approximately 66 °C.

Example: Heat recovery from waste high-temp. water



NOTE: This sketch is for explanation purposes only and is not intended as an installation design.

When the outlet temperature exceeds 95 °C, steam cannot be condensed and will be discharged from the exhaust outlet.

● Required Water Differential Pressure

Because SR-B1.5/SR-B4 is an atmospheric indirect heat exchanger using stainless steel tubing, make sure the cold water pressure is high enough to maintain a differential pressure at least equal to the differential pressures indicated in the table below. However, the water pressure must not exceed 1.0 MPaG.

Water Quantity (t/h)		1	2	3	4	5	6	8	10
Min. Differential Pressure (MPa)	SR-B1.5	0.03	0.11	0.23	0.40	0.62	—	—	—
	SR-B4	—	—	0.03	0.05	0.07	0.10	0.17	0.27

Memo:

Manufacturer
TLV CO., LTD.
Kakogawa, Japan
is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001
ISO 14001

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