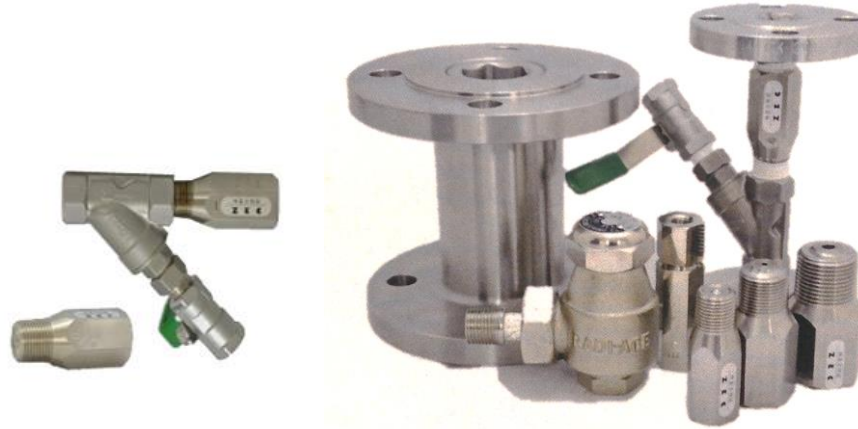


Continuous Condensate drain (Orifice Steam Trap)



Steam Z is a condensate discharge system developed with a completely new approach. Equipped with only an open orifice. It is free from mechanical moving parts and without troublesome maintenance works which cannot be avoided with conventional steam traps.

By offering better heat transfer, it contributes not only to Energy saving but also to the improvement of productivity.

Steam Z has been adopted in various industries such as Chemical, Pulp , Petrochemical, Textile, Steel , Food processing etc.

Structure of Steam Z

The structure of Steam Z is very simple. It has a permanently open orifice, and there is no opening/closing mechanism. Because of Steam Z's small size, simple shape and light weight, the installation work and the heat insulation work are very easy.

The piping upstream and downstream of Steam Z can be of a smaller diameter, which means a reduction in piping cost..

There are no moving parts, which may break down. So, Steam Z has a very high long term reliability.

The basic model of Steam Z has a single orifice, but there are models with several orifices in series or in parallel to cope with different operating conditions.

Another notable feature of Steam Z is that the passageway of condensate from the inlet to the outlet is in a straight line, and there are no bends to hinder the smooth flow of condensate. There is no air-lock or gas-lock, and the condensate evacuates without stagnating. So, a high security co-efficient is not required. All of this leads to energy-saving.

The models with an orifice of a small diameter are equipped with an integrated filter.

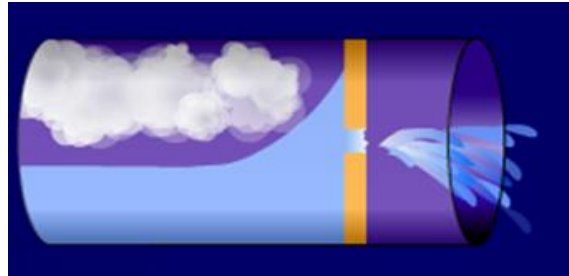
Steam Z Product benefit

1. Steam Z has no moving parts. With an open orifice, Steam Z evacuates condensate continuously. It can be used for more than 20 years with little maintenance.
2. Steam Z keeps its initial performances in time, with little maintenance. Even when inspection is needed, the simple structure, light weight and simple shape of Steam Z save labour and time.
3. Steam Z has almost no steam leakage. Furthermore, it cannot suffer from blow-through breakdowns. So, it contributes to energy-saving.

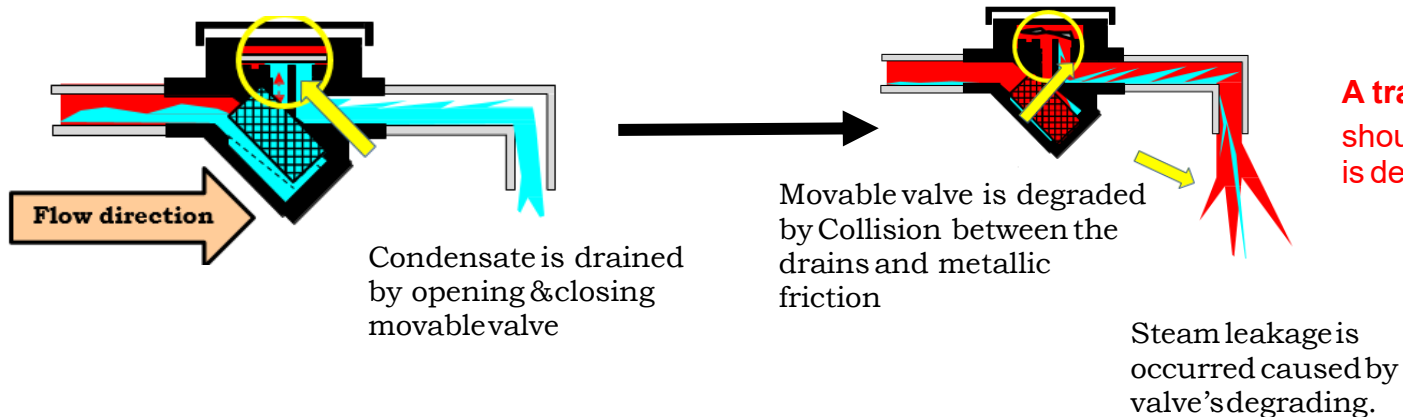
Steam consumption reduction → Fuel reduction → CO2 reduction

4. Except for the flow direction, there are no restrictions for its position on installation. Steam Z can be mounted horizontally, in an inclined position and vertically even facing upwards. It is also ideal for a moving environment like on a ship
5. The simple structure, light weight and simple shape of Steam Z make the installation easy. It can be of a smaller diameter compared to a conventional steam trap of the same capacity, which means smaller diameter piping and a big reduction in piping cost, especially for new piping.
6. Steam Z evacuates condensate continuously and improves the heat transfer, which means an increased productivity. There are no water hammers.
7. The passageway of condensate is in a straight line, and there is nothing to hinder the free passage of condensate. There is no air-lock or gas-lock phenomenon. Start-up time in the morning can be reduced.
8. Steam Z adapts instantly to load variations. So, in case of a program control, the temperature control can be done smoothly and with precision.
9. Steam Z can cope with very large quantities of condensate, very high steam pressure, very low differential pressure, which, normally, cannot be handled by a conventional steam trap.

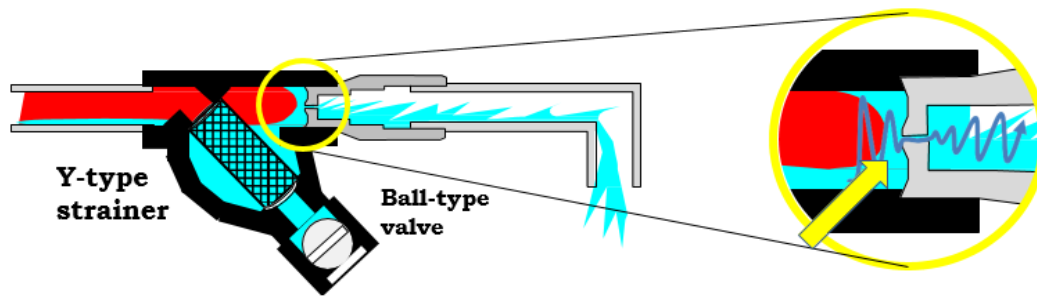
Steam Z Concept of Condensate drain design



As the steam flows more than 30 times faster than the condensate, the speed differential between the steam and the condensate produces waves, and these waves seal the orifice at more than 99 % of the time, allowing almost no steam to go through.



A traditional steam trap should be replaced with a new one because it is degraded in a few years.



Y-type strainer

Ball-type valve

Should be cleaned off inside by opening valve after terminating.

Movable valve is unnecessary because condensate itself closes orifice hole when draining out.






Steam Z

No maintenance is required because no steam leakage is occurred caused by valve's degrading.

Comparison between Steam Z and Conventional steam trap

	Items	STEAM·Z	Conventional steam trap
1	Thermal efficiency improvement	10 – 15% up	No
2	Shelf life	More than 20 years	3 – 5 year
3	Deterioration	0.3% (15 years)	20 – 35% (5 years)
4	Water Hammer	No	Can be happen
5	Maintenance	No	Have to do maintenance

Steam Z Products model

	<p><i>Steam Z standard type</i></p> <table border="1" data-bbox="696 183 2007 320"> <thead> <tr> <th data-bbox="696 183 1364 252">Maximum pressure</th> <th data-bbox="1364 183 2007 252">Maximum capacity</th> </tr> </thead> <tbody> <tr> <td data-bbox="696 252 1364 320">1.0Mpa</td> <td data-bbox="1364 252 2007 320">7,500kg/h</td> </tr> </tbody> </table>		Maximum pressure	Maximum capacity	1.0Mpa	7,500kg/h
Maximum pressure	Maximum capacity					
1.0Mpa	7,500kg/h					
	<p><i>Steam Z type P</i></p> <table border="1" data-bbox="696 397 2007 534"> <thead> <tr> <th data-bbox="696 397 1364 466">Maximum pressure</th> <th data-bbox="1364 397 2007 466">Maximum capacity</th> </tr> </thead> <tbody> <tr> <td data-bbox="696 466 1364 534">2.0Mpa</td> <td data-bbox="1364 466 2007 534">50kg/h</td> </tr> </tbody> </table>		Maximum pressure	Maximum capacity	2.0Mpa	50kg/h
Maximum pressure	Maximum capacity					
2.0Mpa	50kg/h					
	<p><i>Steam Z type LP (for high pressure)</i></p> <table border="1" data-bbox="696 611 2007 748"> <thead> <tr> <th data-bbox="696 611 1364 679">Maximum pressure</th> <th data-bbox="1364 611 2007 679">Maximum capacity</th> </tr> </thead> <tbody> <tr> <td data-bbox="696 679 1364 748">20.0Mpa</td> <td data-bbox="1364 679 2007 748">1,000kg/h</td> </tr> </tbody> </table>		Maximum pressure	Maximum capacity	20.0Mpa	1,000kg/h
Maximum pressure	Maximum capacity					
20.0Mpa	1,000kg/h					
	<p><i>Steam Z type F</i></p> <table border="1" data-bbox="696 825 2007 962"> <thead> <tr> <th data-bbox="696 825 1364 893">Maximum pressure</th> <th data-bbox="1364 825 2007 893">Maximum capacity</th> </tr> </thead> <tbody> <tr> <td data-bbox="696 893 1364 962">20.0Mpa</td> <td data-bbox="1364 893 2007 962">28,000kg/h</td> </tr> </tbody> </table>		Maximum pressure	Maximum capacity	20.0Mpa	28,000kg/h
Maximum pressure	Maximum capacity					
20.0Mpa	28,000kg/h					
	<p><i>Lotus Z (for high capacity)</i></p> <table border="1" data-bbox="696 1038 2007 1176"> <thead> <tr> <th data-bbox="696 1038 1364 1107">Maximum pressure</th> <th data-bbox="1364 1038 2007 1107">Maximum capacity</th> </tr> </thead> <tbody> <tr> <td data-bbox="696 1107 1364 1176">20.0Mpa</td> <td data-bbox="1364 1107 2007 1176">No limitation</td> </tr> </tbody> </table>		Maximum pressure	Maximum capacity	20.0Mpa	No limitation
Maximum pressure	Maximum capacity					
20.0Mpa	No limitation					

Steam Z standard type



- **15 A type**

Specification	Capacity
Maximum working pressure	1.0 MPa · G
Maximum working temperature	200 °C
Maximum drain emissions	670 kgf / hr

Since the orifice diameter of the 15A type is relatively small as $\Phi 3.0$ mm at the maximum, it is sold as a set with a dedicated Y strainer and a ball valve to the main body to prevent clogging.

- **20 A type**

Specification	Capacity
Maximum working pressure	1.0 MPa · G
Maximum working temperature	200 °C
Maximum drain emissions	3,750 kgf / hr

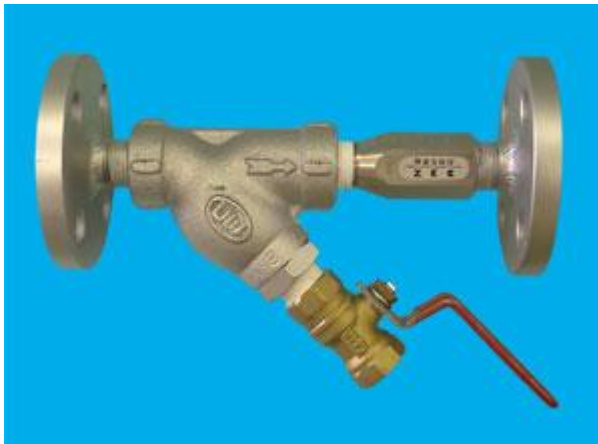
For 20A type, the orifice diameter is maximum $\Phi 3.2 \sim \Phi 6.5$. As our company recommends the use of a dedicated Y strainer and a ball valve set, we also sell it only at the main body according to customer's request.

- **25 A type**

Specification	Capacity
Maximum working pressure	1.0 MPa · G
Maximum working temperature	200 °C
Maximum drain emissions	7,510 kgf / hr

The 25 A type has a maximum orifice diameter of Φ 7.0 to Φ 10 mm and its hole diameter is large, so we have never clogged up so far, so we recommend selling with only the main body.

Flange connections



Specification	
Standard	ANSI ,ISO, JI, JIS etc
Distance between flange (L)	1/2" \geq 230 mm
	3/4" \geq 260 mm
	1" \geq 280 mm

Steam · Z Type P



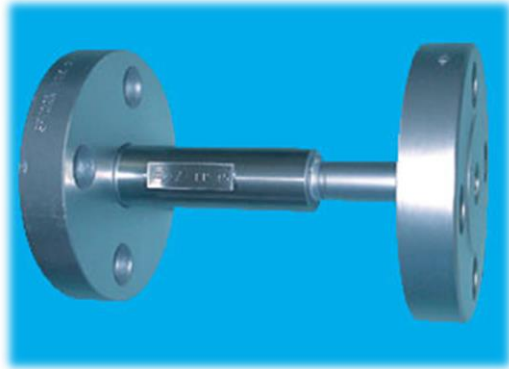
Specification	Capacity
Maximum working pressure	2.0 MPa · G
Maximum working temperature	260 °C
Maximum drain emissions	50 kgf / hr

P type is widely used for condensate collectors of steam pipes for pressures 1.0 Mpa · G ~ 2.0 Mpa · G that can not be handled with the standard type.

Adjust the drain discharge capacity at the internal orifice pore size and stage depending on usage conditions. Built - in strainer.

Flanges can be installed and delivered.

Steam · Z Type LP (for high pressure)



Specification	Capacity
Maximum working pressure	20.0 MPa · G
Maximum working temperature	500 °C
Maximum drain emissions	1,000 kgf / hr

LP type is a product for use under higher pressure environment than P type. In order to cope with high pressure, the entrance side is a lap flange connection. The internal structure is the same as P type.

The capacity of each model is adjusted by the diameter and number of orifices. These models are in stainless steel and have an integrated filter, and are suitable for applications over 4Mpa, such as high pressure steam pipes, resin pellet extruders, etc. Cost effective and long service life.

Steam · Z Type F (for high pressure)



Specification	Capacity
Maximum working pressure	20.0 MPa · G
Maximum working temperature	500 °C
Maximum drain emissions	28,000 kgf / hr

F type is a product that can handle up to 1.0 to 28 t / hr of drainage in the high pressure region of 1.0 MPa · G ~ 20 Mpa · G. There is no welded part by integrally cutting from the round bar of SUS 304.

These models have an integrated filter and can have one or several orifices.

SUS-304 is used as standard material, but can be changed depending upon the operating conditions. Flanges can be made according to any standards such as ANSI, ISO, JIS, JPI, etc.

Examples		
Pressure	Condensate	Application
18.3 Mpa	10,300 kg/hr	Steam line (Thermal power plant)
11.5 Mpa	15,000 kg/hr	Production of ethylene

Zetron IV (for steam iron)



Specification	Capacity
Maximum working pressure	0.7 MPa · G
Maximum working temperature	500 °C

Zetron IV have been developed for the evacuation of small quantities of condensate generated in the tracing pipes. They have a filter and 4 orifices. There are 4 models (a, b, c and d) with different orifice diameters.

Steam · Z SUS Y Strainer Guide

Materials : Stainless steel



External Y Strainer



Y Strainer inside

Application Examples

❖ **Air Heater (Aero Fin Tube type, Tumbler dryer, Hot Air circulation, etc)**

1. Hot air temperature has raised in 5-20 °C
2. Drying time has been shortened , raised in feed time
3. Productivity has been improved by 5-10%
4. Steam consumption was reduced 5-20%

❖ **Cylinder Drying machine (Cardboard factory, Spinning factory, Dyeing factory and Linen supply)**

1. Warm-up time has been shortened
2. The surface temperature of the cylinder has been made stable and raised in 5-10 °C
3. Productivity has been improved 5-20%
4. Steam consumption was reduced 5-10%

❖ **Tank heated by Coil (Oil Tank, Plate Layer , Dyeing Tank)**

1. Heating-up period has been shortened 15 min. (from 70 min. to 55 min.)
2. The Steam hammering has been disappeared
3. Steam consumption was reduced 5-10%

❖ **Tank heated by Jacket (Boiling Kettle, Kneading machine)**

1. The heat transfer and cooking in each jacket boiler have been made uniformly, management has been made easier
2. Cooking period has been shortened and productivity has been improved
3. Steam consumption was reduced 5-10%

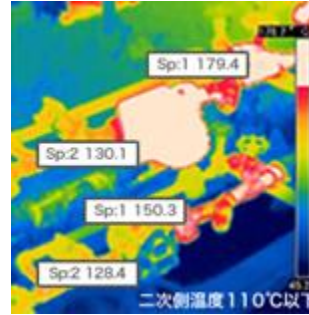
❖ **Large Quantity of Condensate Drainage (Reboiler of Distillation tower in Petrochemical Industry)**

Inlet pressure 1.4 MPa / Outlet pressure 0.68 Mpa / Condensate drain volume 8 ton / hr

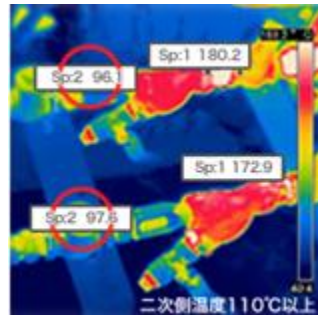
1. Existing five Steam traps have been replaced by using only 1 set of Steam Z.
2. The number of valves has been reduced to 3 from 15 and also made size smaller.
3. The installation area has been reduced to 2 m² from 10 m²

4. Existing Steam trap was being exchanged in 3 years, but Steam Z has been operating for 15 years without troubles.

Installation Case



Before introduction ... Leakage

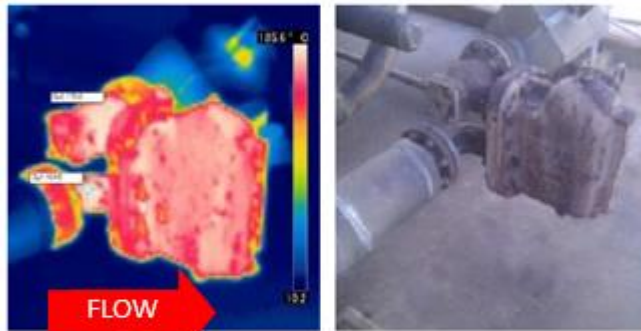


Steam · Z after introduction ... no leak

BEFORE

Conventional Steam Trap

Year 2005



Recheck 2015

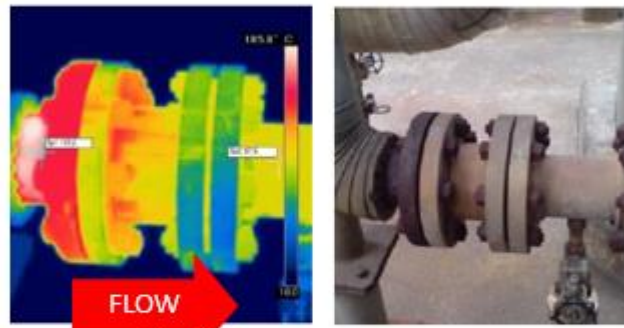
Inlet temp : 184.8 °C

Outlet temp : 179.2°C

AFTER

Installation of Steam Z

Year 1998



Recheck 2015

Inlet temp : 185.2 °C

Outlet temp : 97.5°C

Conditions 10 years later :::> Huge Steam Leak !! Conditions 17 years later :::> No Steam Leak

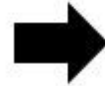
BEFORE

Conventional Steam Trap



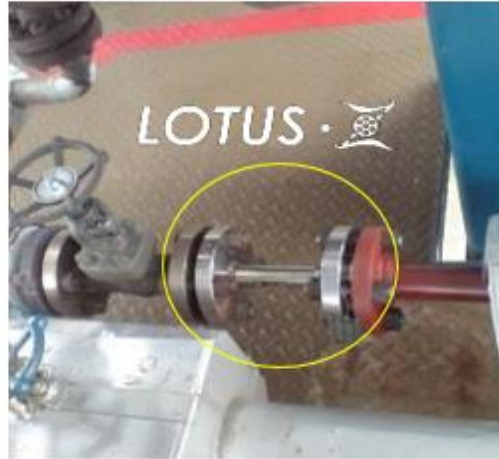
ΔP : 1.5 MPaG

Average Steam volume : 2,500 kg/h



AFTER

Installation of **Steam Z**



ΔP : 1.5 MPaG

Average Steam volume : 1,800 kg/h



Reducing Steam loss : 700 kg/h