Continuous Condensate drain
For Energy and Fuel cost saving

Best Solution to Cost Saving and Reduction of CO2

Simple is the Best

Engineering Co., Ltd.
<table>
<thead>
<tr>
<th><strong>Name</strong></th>
<th>Z Engineering CO,. LTD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main office</strong></td>
<td>Fuji bldg 2F, 2-11-7, Nishi-koiwa, Edowaga-ku, Tokyo, Japan 133-0057</td>
</tr>
<tr>
<td><strong>Chairman</strong></td>
<td>Mr. Hiroki HIGASHINO</td>
</tr>
<tr>
<td><strong>President</strong></td>
<td>Mr. Tetsuya ISHII</td>
</tr>
<tr>
<td><strong>Established</strong></td>
<td>October 6, 1984</td>
</tr>
<tr>
<td><strong>Capital</strong></td>
<td>50,000,000 yen</td>
</tr>
<tr>
<td><strong>Product brand</strong></td>
<td>Steam Z</td>
</tr>
</tbody>
</table>
Do you have problem with Traditional steam trap losses?
The structure of a traditional steam trap

A traditional steam trap is a kind of device which automatically drains by opening and closing of movable valve. There are some kinds of steam trap such as ‘disk type’, ‘floating type’, ‘bucket type’, ‘temperature regulating type’ according to the structure of valve.

Floating Type

When Closing

When Opening

Traditional steam trap
Fuel Cost Increase due to the degrading

- A traditional steam trap is generally degraded in a few years and comes to leak much steam.
- Boiler would be operated more than before to make up the steam leaked, fuel cost would rapidly increase.

Mechanism of Degrading

- Steel ball repeats opening and closing so many times, it soon comes to degrading.
- Makes steam leakage without draining condensate.
Steam is exhausted with condensate when the steam trap is degraded.
- Fuel consumption increases to make up the leaked steam.
- The piping trouble such as the water hammers happens frequently.
- Condensate cannot be recovered but steam leaks.
- It has been released from the maintenance work.
- Fuel cost has been rapidly reduced and condensate can be recovered without steam leakage.
- Water hammering has not been happened.
Steam Z - Concept of Condensate drain design (B)

The condensate occupies half of the pipe. If condensate and steam were to flow at the same speed, there would be no friction between the condensate and the steam. So, there would always be steam leakage through the orifice. (A)

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. (B)

However, in reality, the things are NOT like this.

http://www.steam-z.com/english/50.html
The best solution by STEAM • Z

Condensate drainage in the case of very low pressure difference

- STEAM • Z with no movable valves can drain more than 10 tons of condensate even if it was in the location of very low pressure (under 0.05 MPa).
- STEAM • Z can stop using of some devices which is required to drain condensate by compulsion and of the laying of the pipes.
- Large amount of Energy cost and maintenance cost can be saved.

0.05MPaG

Trap for operating

Steam pipe for operating

pipe for draining

Drain Header

Power Trap

0.1MPaG

Heating Unit

H

ea

1

ir

0.05MPaG

0.1MPaG

Heating Unit

ΔP : 0.05MPaG
The best solution by STEAM・Z

Quality control by “Stabilization of the condensate drainage”

• Because a traditional steam trap in the plate-type heat exchanger which is being driven by low pressure steam hardly able to open the valve, so condensate is stayed in the plate and that makes a big heat stress in the part, consequently makes troubles such as breaks plate packing.

• STEAM・Z with no movable valves includes a designed drainage hole so that consumption steam = condensate may be drained by the regulation pressure, and even low pressure steam

• Drains condensate in stable way. As a result, accumulation of condensate is minimized, trouble of packing is reduced.
Mechanism of **STEAM・Z**

Steam・Z has no movable valve which means degraded parts.

Steam・Z drains just only condensate with no any movable valve by using fixed drainage holes (**Orifice hole**) which is properly designed.

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

Traditional steam trap

Steam leakage is occurred caused by valve’s degrading.

**STEAM・Z**

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

Y-type strainer

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

Ball-type valve

Should be cleaned off inside by opening valve after terminating.
Mechanism of STEAM

The diameter of orifice hole is designed based on the volume of maximum condensate and Pressure Difference

Relation between Pressure Difference & Maximum Condensate

When condensate is reduced (it means that the temperature of the material to be heated increases. So CV is throttled), pressure difference will be decreased and the load factor can be kept constantly.
**BEFORE**

Conventional Steam Trap

ปีที่ติดตั้ง : 2005

---

**AFTER**

Installation of **Steam Z**

ปีที่ติดตั้ง : 1998

---

**Recheck ปี 2015**

Inlet temp : 184.8 °C
Outlet temp : 179.2 °C

10 ปีหลังการติดตั้ง :> ไอน้ำรั่วอย่างมาก !!!
Conditions 10 years later :> Huge Steam Leak !!

---

**Recheck ปี 2015**

Inlet temp : 185.2 °C
Outlet temp : 97.5 °C

17 ปีหลังการติดตั้ง :> ไม่มีไอน้ำรั่ว
Conditions 17 years later :> No Steam Leak
Conventional Strap... Leakage

Replacement with **Steam Z**... no leak
Conventional Steam Trap

ΔP : 1.5 MPaG
อัตราการใช้ไอน้ำโดยเฉลี่ย : 2,500 kg/h
Average Steam volume : 2,500 kg/h

Installation of Steam Z

ΔP : 1.5 MPaG
อัตราการใช้ไอน้ำโดยเฉลี่ย : 1,800 kg/h
Average Steam volume : 1,800 kg/h

*** ลด Lost 700 kg/h
*** Reducing : 700 kg/h
LOTUS • The ultimate solution to Cost saving and quality control of products

BEFORE

Traditional Trap

AFTER

STEAM • Z ( LOTUS • Z )

NO Steam Leak design
### Steam Z Products models

<table>
<thead>
<tr>
<th>Model</th>
<th>Maximum pressure</th>
<th>Maximum capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Steam Z : Standard type</strong></td>
<td>1.0Mpa</td>
<td>7,500kg/h</td>
</tr>
<tr>
<td><strong>Steam Z : type P</strong></td>
<td>2.0Mpa</td>
<td>50kg/h</td>
</tr>
<tr>
<td><strong>Steam Z : type LP (for high pressure)</strong></td>
<td>20.0Mpa</td>
<td>1,000kg/h</td>
</tr>
<tr>
<td><strong>Steam Z : type F</strong></td>
<td>20.0Mpa</td>
<td>28,000kg/h</td>
</tr>
<tr>
<td><strong>LOTUS Z (for high capacity)</strong></td>
<td>20.0Mpa</td>
<td>No limitation</td>
</tr>
</tbody>
</table>
Standard Model 15A type
Max Pressure 1.0 Mpa • G , Max Drainage Capacity 670 kg/hr

15A type is relatively small and the φ 3.0 mm of orifice diameter is at a maximum, this type is being sold by set with an exclusive Y strainer and ball valve in order to prevent clogging.

Model No.
Z-45/46/47/48/49/410
Z-56/57/58/59/510

Y strainer and ball valve SET
**Standard Model 20A type**
Max Pressure: 1.0 Mpa · G, Max Drainage Capacity: 3,750 kg/hr

20A type is designed by the orifice diameter $\phi$ 3.2 ~ $\phi$ 6.5 mm. Recommend to use that sets the Y strainer and ball valves, but we also sell only in the body by customers’ requirement.

**Model No.**
Z-2A/5A/8A/0B/5B
Z-7B/0C/5C/0D/5D

**Standard Model 25A type**
Max Pressure: 1.0 Mpa · G, Max Drainage Capacity: 7,510 kg/hr

25A type orifice diameter is designed so large as $\phi$ 7.0 ~ $\phi$ 10 mm, so we recommend the sale of the body only because we have never experienced clogging so far.

**Model No.**
Z-0E/5E/0F/5F
Z-0G/5G/0H
Product Portfolio

- **Model P type**
  Max Pressure 2.0 Mpa · G, Max Drainage Capacity 50 kg/hr

P type is often used in the steam pipe of pressure 1.0 Mpa · G ~ 2.0Mpa · G which standard model can not cope. The drainage capacity is adapted by adjusting the size of diameter of orifice or the number of stages of the interior of the orifice. This type sold with the strainer internal organs, possible to deliver with flange.

  **Model No.**
  
  P-45/46/47/48/49/410
  P-412/415/418/420/425
  P-430/330/230/130

- **Model LP type**
  Max Pressure 20.0 Mpa · G, Max Drainage Capacity 1,000 kg/hr

LP type is a product for use in a high pressure environment than the P type. To cope with the high pressure, the inlet side is lap flange joints. Internal structure is the same as the P-type, it is popular in **high-pressure steam pipe or in the resin pellets extruder**.

  **Model No.**
  
  LP-45/46/47/48/49/410
  LP-412/415/418/420/425
  LP-430/330/230/130
**Model F type**

Max Pressure 20.0 Mpa · G , Max Drainage Capacity 28,000 kg/hr

F type is a product which possibly correspond to condensate drainage amount 1.0 - 28.0 t / hr in the high pressure region of 1.0Mpa · G ~ 20.0Mpa · G. Integrally machined from SUS 304 round bar, there is no weld.

---

**Model HP type**

Max Pressure 20.0 Mpa · G , Max Drainage Capacity 50 kg/hr

HP type is the best product to place like the condensate amount is minimum at high pressure. Because this product is also integral cutting from a round bar, weld is not. It is popular in the thermal power plants and the like.
• **LOTUS • Z type**
  Max Pressure 20.0 Mpa · G , From Low to High Pressure, Ultrahigh Capacity

Lotus · Z can process unlimited condensate volume by single and is compatible to a large capacity of the heat devices from low pressure to high pressure such as **Heat exchanger, Reboiler, Air heater.** Face-to-face minimum L : 150 mm and small, lightweight, so the piping cost will be significantly reduced.

• **ZETRON IV type**
  Max Pressure 0.7 Mpa · G , ( For Steam Presser )

Zetron IV has been developed for the **steam iron** used in **the laundry** where condensate amount is relatively small.
Major customer (oversea)

Achilles
Asahi Kasei
Asahi Denka
Asahi Beer
Idemitsu
Ibaragi Kasei
Energy Advance
Oji Paper
Oji Hanshi
Oji Rubber
Okinawa Refining
Konahama Refining
Kabaya Industry
Kikkoman
Kibun Food
Kyushu Power
Kyoto Univ. Hospital
Kyowa Hakko
Kyowa Oil
Kirin Beer
Kurare
Konoha Kagaku
Koito Manufact.
Kobe Steel
National Cancer Inst.
Sapporo Beer
Showa Cabot
Showa Denko
Johnson&Johnson
JFE
JSR
Shinkoshi Chemical
Shin-nissen
Shin-nihon air conditioning
Shin-nihon refining
Sumitomo Chemicals
Sumitomo metal
Sumitomo Pharmaceuticals
Seibu Gas
Daikin
Daisel Chemical
Daido Special Steel
Taisho Paper
Taisho Pharmaceuticals
Da Nihon Ink
Daihatsu
Takasago Parfums
Takasago Heat
Takeda Pharmaceuticals
Chuo Paper
Nicchu Coca Cola
Chugoku Power
Chubu
Chiyoda
Teijin
Toa Chemical
Tokyo Gas
Tokyo Power
Toshiba
Tonen Chemical
Tonen General
Toho Chemicals
Toyo Rubber
Toso
Toray
Toyoda Synthetic
Toyota Motors
Nichiban
Nikka Wiskey
Nissan Motors
Nisseki Hospital
Nihon Glass
Nihon Moshoku
Nihon Gosei
Nihon Shokubai
Nihon Seishi
Nihon Zeon
Nihon Petrol
Nihon Cardboard
Nihon Delmonte
Nihon Yushi
Nihon Yunika
Nihan Manufact.
Nisso Metal
Hitachi
Fujisawa Pharmaceuticals
Fuji Heavy Industries
Fuji Petrol
Fuji Yunibansu
Bridgestone
Fresh Diner
Hokuren
Honda
Matsushita
Matsushita Batteries
Maruzen Petrochemical
Matsuda
Mitsubishi Chemical
Mitsubishi Rayon
Meiji
Morinaga
Yuki Gosei
Yokohama Rubber
Yotsuba
Self-defense force
Rengo
Wako Chemical
ACHSO (Thailand) CO., LTD.

474 Soi Suksawad 35, Suksawad Road, Ratburana
Bangkok 10140

Contact: SURASAK S.
E-mail: project_achsoth@Hotmail.com

Tel: (089) 6688699  Fax: (02) 8181203
Line ID: eco2017